BASICS

Computer Literacy

5E

A Comprehensive Guide to IC³



Connie Morrison
Dolores Wells
Lisa Ruffolo

IC³ INTERNET AND COMPUTING CORE CERTIFICATION
GLOBAL STANDARD 4

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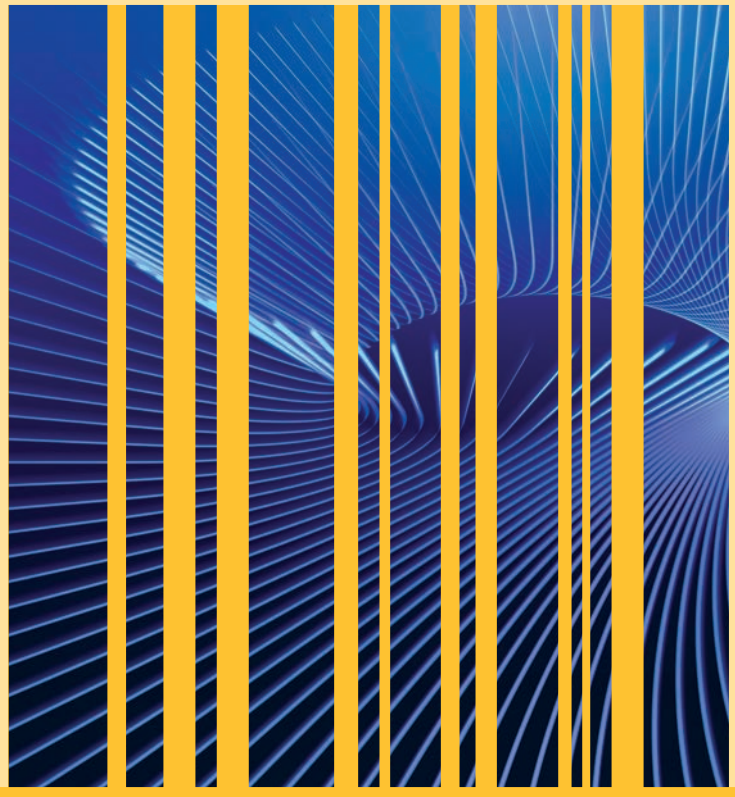
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BASICS

Computer Literacy

FIFTH EDITION

A Comprehensive Guide to IC^3



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The Software Resource

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ABOUT THIS BOOK

Computer Literacy BASICS, Fifth Edition, provides complete coverage on computing basics, including computer hardware and components, operating system software, application software, networks, and the Internet. Lessons are organized in three modules and within each module, concepts and features are introduced in a logical progression to build on previously learned concepts and features. Illustrations provide visual reinforcement of features and concepts, and sidebars provide notes, tips, and concepts related to the lesson topics. Step-by-Step exercises provide guidance for using the features. End-of-lesson projects include a comprehensive review of the lesson content. Teamwork projects, Critical Thinking activities, Online Discovery challenges, Job Skills projects, and Explore and Solve tasks provide additional practice and require you to apply your problem-solving skills.

The Computing Fundamentals module focuses on hardware and software and how they work together. The lesson activities include exercises that guide students to explore the Windows operating system, change settings, and customize the desktop. Students also learn how to manage files and folders, install and uninstall software, and solve computer problems. Hands-on exercises, lesson reviews, and end-of-lesson projects provide students with opportunities to practice and master computing fundamental skills. The Module 1 IC^3 Pretest includes additional review questions and projects.

The Key Applications module focuses on four of the Microsoft Office 2013 applications: Word, Excel, PowerPoint, and Access. The lessons explain the purpose of commonly used software features, and step-by-step exercises demonstrate how to use those features. The end-of-lesson projects provide additional practice to master using those features to complete typical day-to-day tasks at home, school, and work. The Module 2 IC^3 Pretest includes review questions, projects, and an integrated project which entails using word processing, spreadsheets, presentations, and databases to process information and then share the information with others.

The Living Online module introduces students to communication network fundamentals and the relationships between networks and the Internet. Through hands-on exercises, students learn how to use e-mail software to exchange e-mail messages. They also learn how to use a Web browser to navigate the Internet, visit Web sites, and find information. The final section focuses on how to use computers at work, school, and home. It discusses the risks of working with hardware and software and the standards for using the Internet safely, ethically, and legally. The Module 3 IC^3 Pretest provides a thorough recap of living online concepts and skills, including review questions, projects, and a job simulation.

To complete all lessons, end-of-lesson material, and IC^3 Pretests in this book will require approximately 55 hours.

Start-Up Checklist

Hardware

- Computer and processor: 1 gigahertz (GHz) processor or higher
- Memory: 1 gigabyte (GB) of RAM or higher
- Hard disk: 16 gigabyte (GB) available disk space
- Graphics card: Microsoft DirectX 9 graphics device with WDDM driver
- Display 1024 × 768 or higher-resolution monitor

Software:

- Windows 7 or Windows 8 and Microsoft Office 2013.

INSIDE THE BASICS SERIES

Concepts and features are introduced, explained, and applied.

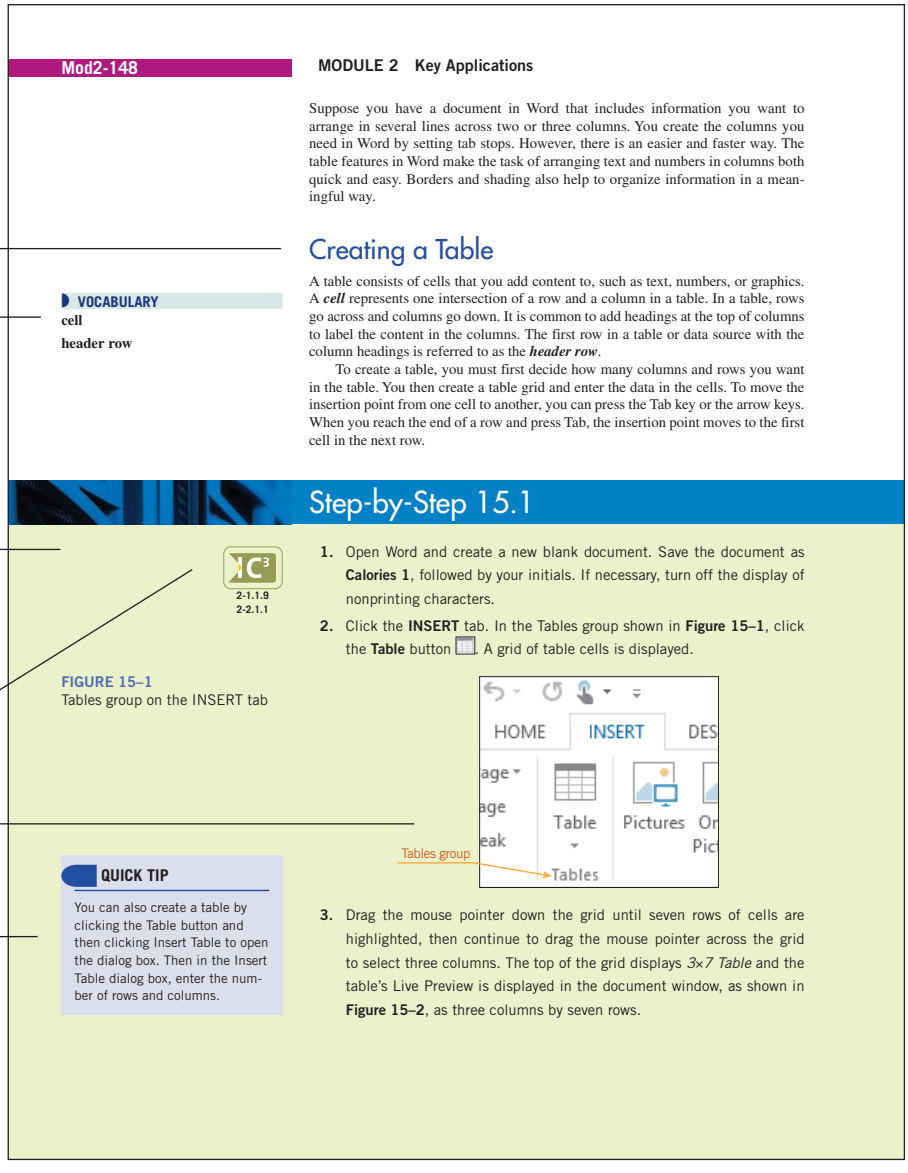
Vocabulary terms are highlighted when they are first introduced and defined.

Step-by-Step Exercises offer "hands-on practice" of the material just learned.

IC³ objective references indicate where the objective is explained and/or practiced.

Figures help guide users through the content and steps.

Margin notes provide tips, shortcuts, and additional information related to the topic.



Mod2-148

MODULE 2 Key Applications

Suppose you have a document in Word that includes information you want to arrange in several lines across two or three columns. You create the columns you need in Word by setting tab stops. However, there is an easier and faster way. The table features in Word make the task of arranging text and numbers in columns both quick and easy. Borders and shading also help to organize information in a meaningful way.

Creating a Table

VOCABULARY
cell
header row

A table consists of cells that you add content to, such as text, numbers, or graphics. A ***cell*** represents one intersection of a row and a column in a table. In a table, rows go across and columns go down. It is common to add headings at the top of columns to label the content in the columns. The first row in a table or data source with the column headings is referred to as the ***header row***.

To create a table, you must first decide how many columns and rows you want in the table. You then create a table grid and enter the data in the cells. To move the insertion point from one cell to another, you can press the Tab key or the arrow keys. When you reach the end of a row and press Tab, the insertion point moves to the first cell in the next row.

Step-by-Step 15.1

IC³ 2-1.1.9 2-2.1.1

1. Open Word and create a new blank document. Save the document as **Calories 1**, followed by your initials. If necessary, turn off the display of nonprinting characters.
2. Click the **INSERT** tab. In the Tables group shown in **Figure 15–1**, click the **Table** button. A grid of table cells is displayed.

FIGURE 15–1
Tables group on the INSERT tab

QUICK TIP

You can also create a table by clicking the Table button and then clicking Insert Table to open the dialog box. Then in the Insert Table dialog box, enter the number of rows and columns.

3. Drag the mouse pointer down the grid until seven rows of cells are highlighted, then continue to drag the mouse pointer across the grid to select three columns. The top of the grid displays *3×7 Table* and the table's Live Preview is displayed in the document window, as shown in **Figure 15–2**, as three columns by seven rows.

Lesson opener elements include the **Objectives,** a list of **Data Files** required for lesson activities, a list of **Words to Know** defined throughout the lesson, and the **Estimated Time** to complete the lesson.

End of Lesson elements include the **Summary**, **Lesson Review Questions**, **Projects**, **Teamwork Projects**, and **Critical Thinking**, **Online Discovery**, **Job Skills**, and **Explore and Solve** activities.

Instructor Resources Disk

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The Instructor Resources CD or DVD contains the following teaching resources:

- The Data and Solution files for this course.
- Instructor's Manual that includes lecture notes for each lesson and references to the end-of-lesson activities and Unit Review projects.
- Answer Keys that include solutions to the lesson and unit review questions as well as sample solutions for end-of-lesson projects and activities.
- Copies of the figures that appear in the student text.
- Suggested Syllabus with block, two quarter, and 18-week schedule
- Annotated Solutions and Grading Rubrics
- PowerPoint presentations for each lesson.

CourseMate

This text includes access to a robust premium Web site called CourseMate. Cengage Learning's CourseMate brings course concepts to life with interactive learning, study, and exam preparation tools that support the printed textbook. CourseMate includes the MindTap Reader, quizzes, flash cards, games, and more! Use these activities to assess and enhance student learning.

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- *Cross-compatible capability*. Import and export content into other systems.

IC^3

IC^3 stands for the Internet and Computing Core Certification program, a global training and certification program. Completing this program and earning IC^3 certification shows that you have the necessary computer skills to excel in a digital world, and are capable of using a wide range of computer technology. IC^3 provides three exams: Computing Fundamentals, Key Applications, and Living Online. The skills needed for these exams are valuable to any functional user of computer hardware, software, networks, and the Internet. By passing the three IC^3 exams, you give yourself a globally accepted and validated credential that provides the proof employees or higher education institutions need.

SAM 2013

Get your students workplace-ready with SAM, the premier proficiency-based assessment and training solution for Microsoft Office! SAM's active, hands-on environment helps students master computer skills and concepts that are essential to academic and career success.

Skill-based assessments, interactive trainings, business-centric projects, and comprehensive remediation engage students in mastering the latest Microsoft Office programs on their own, allowing instructors to spend class time teaching. SAM's efficient course setup and robust grading features provide faculty with consistency across sections. Fully interactive MindTap Readers integrate market-leading Cengage Learning content with SAM, creating a comprehensive online student learning environment.

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— Connie Morrison and Lisa Ruffolo

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Estimated Time for Module: 15.5 hours

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1-3.3.2 1-3.3.4 1-3.3.6 1-3.4.1 1-3.4.3
1-3.3.3 1-3.3.5 1-3.3.7 1-3.4.2 1-3.4.4

Troubleshooting

LESSON 9
Computer Troubleshooting

1-4.1.1 1-4.1.4 1-4.2.1 1-4.3.2
1-4.1.2 1-4.1.5 1-4.2.2 1-4.3.3
1-4.1.3 1-4.1.6 1-4.3.1

LESSON 10
Data and Hardware Protection

1-4.4.1 1-4.4.2 1-4.4.3 1-4.4.4

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Estimated Time:
1.5 hours

LESSON 1

Computers and Operating Systems

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe the importance of computers in daily life.
- Explain the difference between system software and application software.
- Describe the four major types of operating systems.
- Identify the tasks an operating system performs.
- Start a computer.
- Use an operating system and start an application.
- Lock and shut down a computer.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

application software
boot process
buffer
command-line interface
data
driver
embedded operating system
graphical user interface (GUI)
hardware
icon
information processing cycle
multiuser operating system
open-source software
operating system
random access memory (RAM)
server operating system
software
swapping
system software
utility program
virtual memory

Microsoft product screenshots used with permission from Microsoft Corporation.

This lesson introduces you to computers and their role in daily life, and defines what it means to be computer literate. The lesson also focuses on the part of a computer that most affects your computing experiences: the operating system (OS). In addition to learning about what an operating system does, you'll identify types of operating systems and explore the most recent version of Microsoft Windows.

Understanding the Importance of Computers

Computers are everywhere. During a typical day, you might use your phone to send a message to a friend about meeting for lunch and listen to music as you walk to class. Although you might not realize it, you also use a computer when you withdraw cash from an automated teller machine (ATM), change the temperature setting on a home thermostat, and turn on cruise control as you're driving a car. See **Figure 1–1**.



Listen to music
© Matusciac Alexandru/Shutterstock



Withdraw cash from an ATM
© iStockphoto/ElsvanderGun



Change the temperature setting
© iStockphoto/piranka

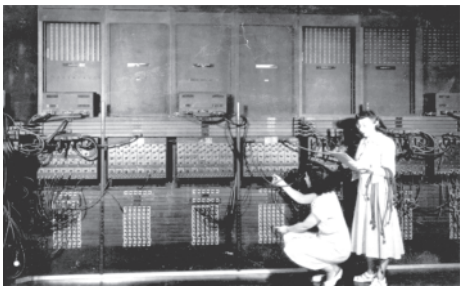


Set the cruise control in a car
© iStockphoto/steauarosie

FIGURE 1–1 Computers are everywhere

Depending on your job, you probably use computers at work to take a diner's order at a restaurant, process a sale, or control a robot on a factory floor.

Overall, computers assist you in most parts of your daily life. They play a central role in worldwide communications, entertainment, education, commerce, and other business activities. In fact, computers have been around since the late 1940s, when they were massive, special-purpose machines with names such as UNIVAC and ENIAC and were designed for use by the military and government. These early computers took hours to complete a calculation, occupied small buildings or entire city blocks, and cost millions of dollars. Today's smartphones have more processing power than a UNIVAC, cost less than any of its components, and fit in the palm of your hand. The future promises innovations such as wearable computers, using human thought as input, and computer-controlled micro-robots that treat and possibly cure cancer. See **Figure 1–2**.



Early computer
U. S. Army photo



Smartphone
© bloomua/Shutterstock



Computer glasses
© Joe Seer/Shutterstock

FIGURE 1–2 Past, present, and future of computers

But what exactly is a computer? What does it really do? Understanding what a computer is and how it works can help you to appreciate and use computers more effectively.

A ***computer*** is an electronic device that receives data (input), processes data, stores data, and produces a result (output). ***Data*** is a collection of raw, unprocessed facts, including text, numbers, sound, images, and video.

A computer includes hardware and software. The actual machine—wires, transistors, and circuits—is called ***hardware***. ***Software*** consists of instructions, or programs, for controlling the computer so it performs tasks. To perform tasks, a computer receives data through an input device such as a keyboard, processes the data, produces information on an output device such as a monitor, and stores the information on a storage device. The input and output devices connected to the computer such as keyboards and monitors are also types of hardware called ***peripherals***. When data is processed into a meaningful form, it becomes ***information***. See **Figure 1–3**.

VOCABULARY
computer
data
hardware
software
peripheral
information



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FIGURE 1–3 Computers include hardware and software

If you work as a clerk in a store, you might use a computer to complete a sale for a customer as follows:

- *Input data*: As you scan an item with a barcode reader, the computer records the name and code of the item.
- *Process data*: The computer uses software instructions to process the data—the item name and code—by looking up the price.
- *Output information*: The computer displays the information—the name and price of the item—on a screen, and then prints it on a receipt.
- *Store data and information*: The computer temporarily stores the item name and code as it looks up the price, and then permanently stores information about the sale on a ***hard disk***, which is hardware for storing data.

VOCABULARY

hard disk

information processing cycle

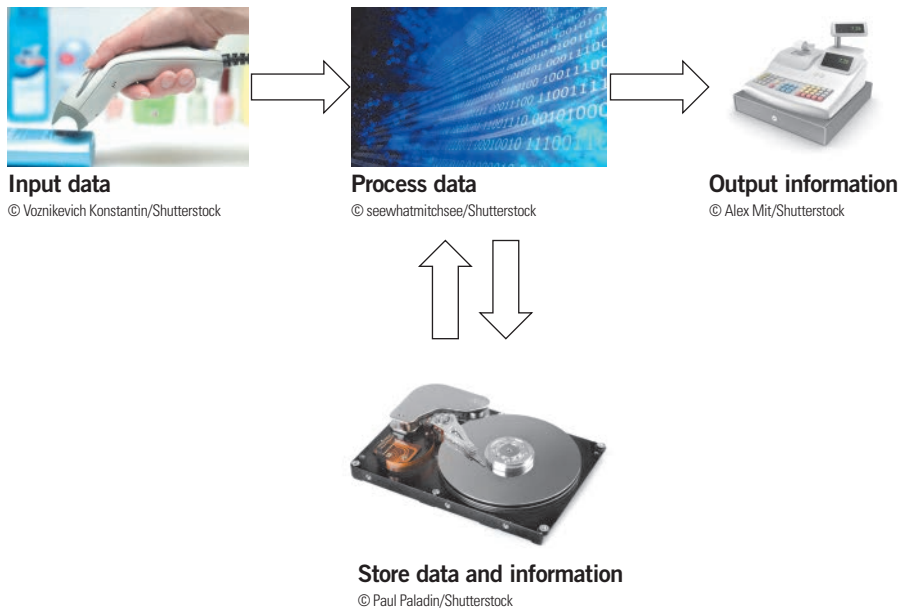
computer literate

digital divide

This series of steps—input, processing, output, and storage (IPOS)—is often referred to as the ***information processing cycle***. You, the computer user, perform the input step first, and then the computer takes over to process the data. The computer often stores the data temporarily, displays the output, and then stores the information during the same stage in the cycle. See **Figure 1–4**.

ABOVE AND BEYOND

When computer experts say "garbage in, garbage out," they mean that the data you provide as input must be accurate and reasonable; otherwise, the output will be inaccurate or misleading.



Input data
© Voznikevich Konstantin/Shutterstock

Process data
© seewhatmitchsee/Shutterstock

Output information
© Alex Mit/Shutterstock

Store data and information
© Paul Paladin/Shutterstock

FIGURE 1–4 Information processing cycle

Computer Literacy

Innovations in computer technology have been rapid since the computer was introduced. To keep up with the pace of change, you need to be ***computer literate***, which means that you can use today's computer hardware and software efficiently to enhance your life and the lives of those around you. Besides having polished computer skills, being computer literate also means that you understand a wide range of information about current computer technology and how it's used to solve problems. Not everyone has the opportunity to be computer literate, however. A ***digital divide*** is an economic gap between those who are computer literate and enjoy access to computer technology and those who do not. The term can refer to people divided from technology by geography, age, education, or socioeconomic status. Attaining computer literacy is important because it can help you succeed in a career, keep in touch with people around the world, and participate as an active, contributing member of contemporary society.

Types of Software

If you shop for a computer at a retail store, the salesperson emphasizes hardware details, such as how quickly the data is processed into information (referred to as processing speed) and how much information can be stored (storage capacity.) However, hardware is not what makes a computer useful—the software installed on it does. Without software, a computer is only a collection of electronic components in a case.

Software provides the means for you to interact with the computer's hardware by entering and receiving information through the user interface. The software on most personal computers has a ***graphical user interface (GUI)***, which displays pictures called ***icons*** and other visual elements that allow you to interact with data and execute commands. For example, to print a document created and stored on a computer, you might select an icon of a printer on the computer screen. The software on the computer sends the information necessary to print the document to a printer attached to the computer. **Figure 1–5** identifies some objects in the Windows 8 graphical user interface.

VOCABULARY

graphical user interface (GUI)

icon

command-line interface

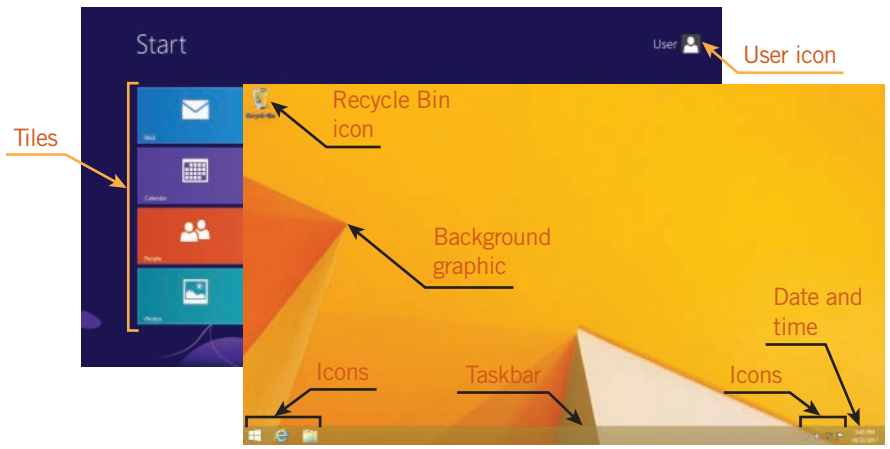


FIGURE 1–5 Graphical user interface

Some software uses a ***command-line interface***, which requires you to type text commands to interact with the computer. **Figure 1–6** shows an example of DOS (short for Disk Operating System), which has a command-line interface.

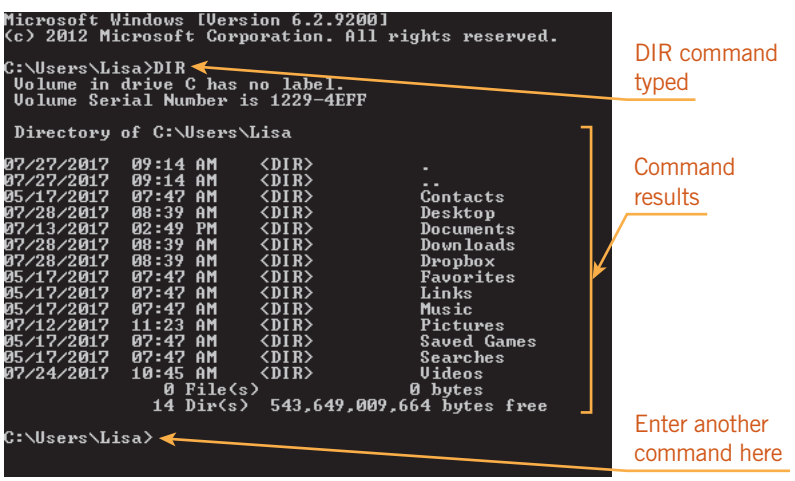


FIGURE 1–6 Command-line interface

Although command-line interfaces require you to remember and type complex commands and allow little room for error, many advanced computer users prefer them because they offer precise control over system details.

In contrast to command-line interfaces, graphical user interfaces are visually inviting and easy for novices to use with only basic training. However, they rarely let users directly access detailed technical settings the way that command-line interfaces do.



1-1.1.1

System Software and Application Software

A computer relies on two main types of software, application software and system software. ***System software*** is the software that runs a computer, and includes the operating system and utility programs. An ***operating system*** is software that coordinates the resources and activities on a computer. A ***utility program*** helps the operating system set up, maintain, and protect a computer. For example, you use a utility program when you connect your computer to the ***Internet***, a worldwide system of linked computers.

As you use a computer, system software works in the background to manage hardware and run other software, called ***application software***, which is the software you use most directly to complete a specific task or to create something electronically. Using application software, you can perform tasks such as writing a report, creating a video, viewing a Web page, or sending photos to a friend. In general, a computer runs system software to perform computer tasks, while you run application software to carry out your work or personal tasks. **Table 1–1** compares operating systems and application software.

VOCABULARY

system software

operating system

utility program

Internet

application software

ABOVE AND BEYOND

A computer's operating system is sometimes called the *platform*. Application software is developed to run on a particular platform. When you purchase an application, the manufacturer notes which platform it runs on. Some manufacturers provide one version of an application designed for one platform, and another version designed for a different platform. Make sure you purchase software that runs on the operating system you have installed on your computer.

TABLE 1–1 Comparing operating systems and application software

	OPERATING SYSTEM	APPLICATION SOFTWARE
Purpose	Operates and controls computer hardware and runs application software	Provides services and information directly to users
Role in a computer system	Coordinates the activities of users, application software, and hardware	Performs tasks based upon user input
Typical tasks	Monitors hardware Manages resources Controls input and output Processes data	Creates documents such as reports and charts Provides entertainment Displays photos
Examples	Windows 8 Mac OS X Android	Microsoft Word (word-processing) Adobe Photoshop (graphics editing) Mozilla Firefox (Web browser)

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Types of Operating Systems

Operating systems fall into four major categories that depend on the type of device for which they are designed: personal computers, mobile computing devices, servers, and devices other than computers. When you purchase a personal computer or mobile device, the operating system is already installed, so your preference for an operating system often determines the computers you can consider purchasing.

IC3 1-1.1.2

Personal Computer Operating Systems

Operating systems installed on a single computer are called personal or desktop operating systems. These are considered single-user operating systems because one user interacts with the operating system at a time. They are also ***multitasking*** operating systems because they let you work with more than one program at the same time. For example, you can look up definitions on the Internet as you write a report and receive e-mail on your laptop.

VOCABULARY
multitasking
Windows 8
Mac OS X

The three most popular personal computer operating systems are Windows, Mac OS, and Linux. Currently, Microsoft Windows runs on more personal computers worldwide than any other operating system. For many years, the most widely used version of Windows was Windows XP, released in 2001. Windows 7, released in 2009, recently surpassed Windows XP in popularity. ***Windows 8***, the most recent major version of Windows, was released in 2012.

Windows became widespread because it ran on inexpensive personal computers created by a variety of computer manufacturers. It retained its popularity because it is easy to use and personalize and runs more types of applications than other operating systems.

In contrast, Mac OS runs only on Apple Macintosh computers. The current version of the operating system is called ***Mac OS X***, where the X is the Roman numeral 10. Releases of Mac OS X up to 10.8 are named after big cats, such as Snow Leopard and Mountain Lion. **Figure 1–7** shows a Macintosh computer running Mac OS X Mountain Lion. Mac OS X version 10.9 is called Mavericks, which marks the beginning of a change in the naming scheme from big cats to places in California. (Mavericks is a surfing location in northern California.)



© iStockphoto/Erikona

FIGURE 1–7 Mac OS X Mountain Lion

Mac OS set the standard for GUI operating systems. Mac OS X has developed the reputation from its users of being a very secure, reliable, and easy-to-maintain operating system.

Linux is a personal computer operating system related to UNIX, an operating system first developed in the 1960s for large, special-purpose computers that are frequently used by scientists and programmers. Unlike Windows and Mac OS, which are proprietary operating systems, meaning they are owned and updated solely by their companies, Linux is released to the public as ***open-source software***, which means that anyone can use, modify, and distribute it. Programmers around the world have collaborated on improving Linux and developing utilities, applications, and enhancements.

Linux is available in versions called distributions, including commercial distributions such as Fedora, openSUSE, Ubuntu, and Mandriva. Distributions offered by noncommercial Linux communities include Debian, Slackware, and Gentoo. **Figure 1–8** shows Ubuntu (named after the African philosophy that encourages humanity toward others), which includes features similar to Windows and Mac OS.

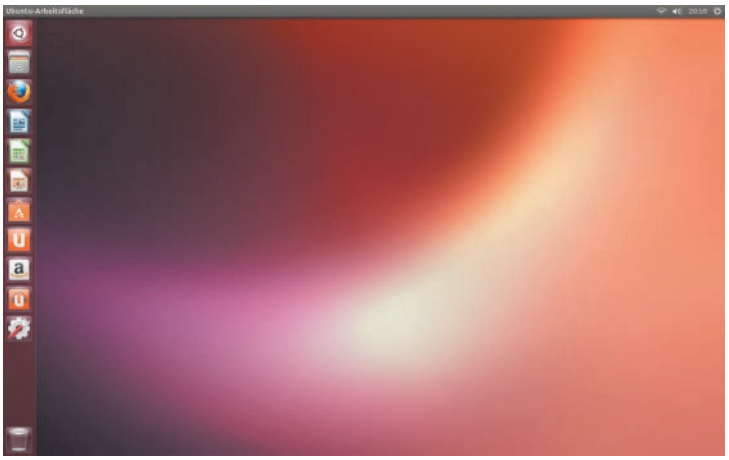
VOCABULARY

Linux

open-source software

ABOVE AND BEYOND

Apple Computers is often credited with introducing the graphical user interface when it released its first Macintosh computer. However, Xerox Corporation first developed the idea of using icons in an interface for an experimental computer called the Alto. This computer and its icons, desktop metaphor, and menus of commands that popped up next to objects influenced the design of later graphical user interfaces, including the one for the Macintosh.



Courtesy of Tim Schultz

FIGURE 1–8 Linux Ubuntu

Some distributions of Linux such as BSD have command-line interfaces. All distributions offer the advantages of running on any type of hardware, providing excellent security, and being free to install and use.

TECHNOLOGY TIMELINE

Early Days of Personal Operating Systems

Personal computer operating systems appeared in the 1980s when IBM and other companies developed the first personal computers. All of these computers had a command-line interface; many ran a version of DOS, such as MS-DOS. ("MS" stands for Microsoft.) In 1984, Apple introduced the Mac OS, which featured one of the first graphical user interfaces on a commercially available computer. Microsoft released Windows 1.0 shortly after the Macintosh debuted, though Windows did not become popular until Microsoft released version 3.1 in 1992. Linux was developed and introduced in the early 1990s by a Finnish student named Linus Torvalds, who set out to create a free operating system kernel. Torvalds released Linux under the terms of a General Public License (GPL), which allows you to copy the operating system for your own use, to give to others, or to sell.

Mobile Operating Systems

A mobile operating system is designed for a small handheld computing device such as a smartphone or tablet. A mobile operating system includes features similar to a personal operating system, but is simpler and significantly smaller. A ***smartphone*** is a cell phone that includes many features of a computer, allowing it to run general-purpose computing applications. Larger than smartphones, ***tablets*** are one-piece mobile computers that typically include a ***touchscreen***, which is a screen you touch to interact with the GUI. Mobile operating systems are designed to fit into the limited memory of mobile devices and work well with mobile hardware and features such as touchscreens, navigation systems, and speech recognition.

Four popular mobile operating systems include iOS, Android, Windows Phone, and Windows RT, which are designed for smartphones and tablets, as shown in **Figure 1–9**.

VOCABULARY

smartphone

tablet

touchscreen

iOS

Android

Windows Phone

Windows RT



Apple iPhone (left) and iPad (right) running iOS

© iStockphoto/Hocus Focus Studio



Smartphone (left) and tablet (right) running Android

© iStockphoto/Moncherie, © iStockphoto/mixmike



Smartphone running Windows Phone (left) and tablet running Windows RT (right)

© iStockphoto/scanrail

FIGURE 1–9 Mobile operating systems

As shown in Figure 1–9, ***iOS*** is a version of Mac OS X written for Apple's mobile devices, including iPhones and iPads. Google developed ***Android*** as an open-source operating system designed to run on many types of smartphones and tablets. Android is derived from Linux. ***Windows Phone*** and ***Windows RT*** are similar to Windows 8.

Mobile operating systems primarily work as single-user, single-tasking operating systems because they let only one user perform a single task at one time. A few recent versions of mobile operating systems let you perform some tasks at the same time, such as search the Internet while making a phone call. They can be considered single-user, multitasking operating systems, though they allow you to perform only two tasks at the same time.

Embedded Operating Systems

VOCABULARY

embedded operating system

server operating system

network

server

Similar to mobile operating systems are ***embedded operating systems***, which run devices such as ATMs, navigation systems, portable media players, digital video recorders, and other consumer electronics. An embedded operating system is included in the hardware of a standalone device. Unlike mobile operating systems, however, embedded operating systems are designed to meet a specific purpose and perform a single type of task, such as providing maps and directions. In addition, an embedded operating system runs with little or no intervention from you or other users. You provide a specific type of input, such as a destination, and the embedded operating system supplies the output, such as directions. See **Figure 1–10**.

ABOVE AND BEYOND

Many embedded operating systems are specialized versions of their more fully featured counterparts, such as Linux and Windows. For example, computerized cash registers, or point-of-sale devices, use an embedded version of Windows to manage sales transactions and keep them secure. Household electronics such as microwave ovens and digital video recorders use embedded versions of Linux to perform their tasks. The iPod has an embedded version of iOS that lets you select and play songs.



© iStockphoto/rafal_olechowski

FIGURE 1–10 Portable and built-in navigation devices have embedded operating systems

Like most mobile operating systems, embedded operating systems are for single users performing a single task at one time. Mobile operating systems such as Android began as embedded operating systems for cell phones and were dedicated to performing tasks such as storing, retrieving, and calling phone numbers. As cell phones evolved into more fully featured smartphones, with the ability to take photos, capture videos, play music, connect to the Internet, and organize personal information, the embedded operating systems evolved into mobile operating systems.

Server Operating Systems

A ***server operating system*** resides on a server and is used to manage a ***network***, which is a group of two or more computers linked together. A ***server*** is a computer that provides network services such as e-mail to other computers, or clients. Because of their purpose, server operating systems are sometimes called *network operating systems*. **Figure 1–11** shows a number of client computers connected to a single server.



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FIGURE 1–11 Server computer on a network

Each client computer on a network has its own personal operating system, while the server runs a server operating system to manage the requests for services from the client computers. For example, if a user on the network wants to print a document, the server operating system handles the request and sends the print job to the printer, where it lines up with other print jobs in a certain order. That way, the printer isn't overloaded with print jobs from dozens of other users on the network. An expert called the network administrator uses the server operating system to manage the network and its users.

Server operating systems are ***multiuser operating systems*** because they let many users run programs and take advantage of the server's resources at the same time. One important task a server operating system performs is balancing user needs so that everyone can access the services and resources they request and that a problem with one user doesn't affect all users.

VOCABULARY
multiuser operating system

Windows Server is the server version of Windows, and Mac OS X Server is the server version of Mac OS. Versions and distributions of UNIX and Linux are also server operating systems. In fact, many servers that handle e-mail and Internet access use UNIX because it is a powerful, flexible multiuser operating system.

Operating System Tasks

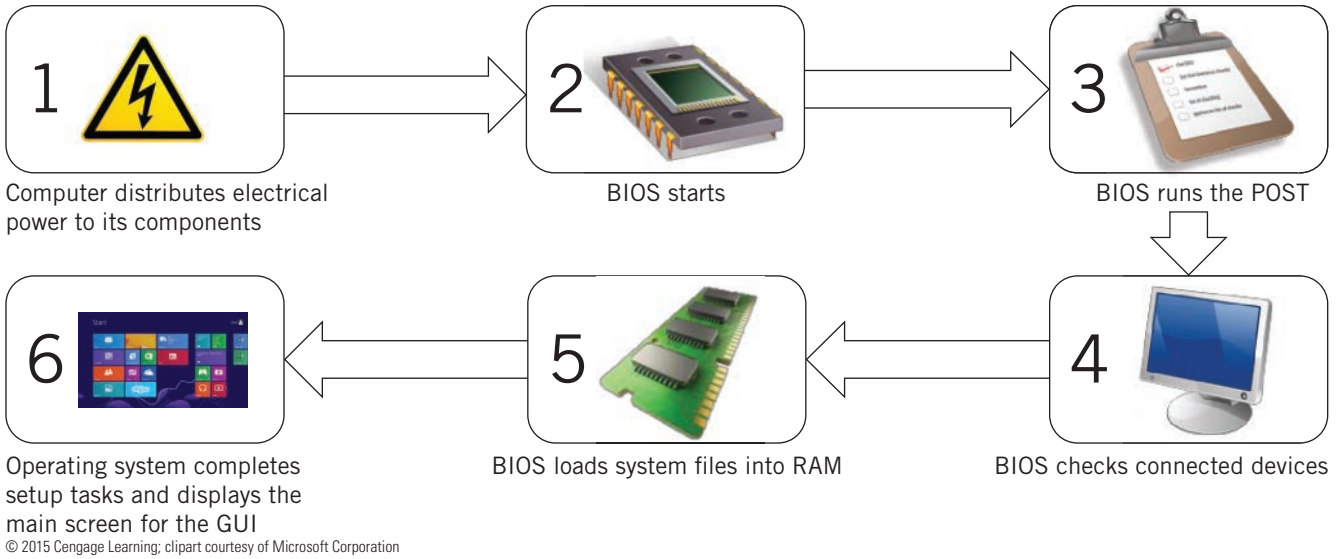
The operating system controls your computer from soon after you turn on the power until you turn it off. During that time, the operating system takes care of technical tasks so that you can focus on completing a school project, listening to music, or communicating with other people, for example. The technical tasks an operating system performs include completing start-up steps, managing memory, processing input and output, controlling hardware, and ending a computer session.

IC3
1-1.1.2

Completing Start-Up Steps

VOCABULARY
boot process
random access memory (RAM)

You turn on the power to the computer to start an operating system. The ***boot process*** is a series of steps the operating system must complete before you can interact with the operating system. **Figure 1–12** illustrates the boot process.



© 2015 Cengage Learning; clipart courtesy of Microsoft Corporation

FIGURE 1–12 Boot process

As Figure 1–12 shows, the boot process includes the following steps:

1. The computer receives and distributes electrical power to its circuits so the system components can run.
2. When a system component called the ROM chip receives power, it starts a utility program called the BIOS, which stands for basic input/output system. The BIOS contains instructions for starting the system before the operating system is loaded.
3. The BIOS performs the power-on self-test (POST) to check critical system components and make sure they are running properly. During this step, your computer might beep and flash messages on the screen.
4. If the system components are running properly, the BIOS looks for devices connected to the computer and checks their settings. If the BIOS finds an error, the computer might beep again and display error messages describing the problem.
5. If Steps 3–4 are successful and error-free, the BIOS searches for the system files the computer needs to run the operating system, and then loads them into ***random access memory (RAM)***, which is memory the computer uses to store instructions and data temporarily. Next, the BIOS loads the kernel, or core, of the operating system into RAM. The kernel takes over control of the computer from the BIOS.
6. The operating system completes setup tasks, such as requesting your username and password, starts and runs utility software and other programs in the background, and then displays the main user interface screen.

ABOVE AND BEYOND

Starting or restarting a computer is also called booting the computer because it must go through the boot process before you can use the operating system. The term "boot" comes from the expression "pulling yourself up by your own bootstraps," which means to accomplish something without external help. A cold boot refers to starting a computer that is turned off. A warm boot (also called a *soft boot*) refers to restarting a computer that is already turned on. Of the steps shown in Figure 1–12, the computer performs only Steps 4–6 during a warm boot.

In Step-by-Step 1.1, you start a computer that runs Windows 8, the most recent version of the Windows operating system, to display the ***Start screen***, which is where you start working on a Windows 8 computer. Many Windows 8 computers have touchscreens, while others use a keyboard and a mouse or touchpad. The Step-by-Steps in this book assume you are using a computer with a keyboard and mouse, so the steps use mouse terms such as ***click*** (press the left mouse button) when instructing you to interact with the computer. For example, you click an icon to select it. If you are using a touchscreen, you should tap instead of click. The introductions to other Step-by-Steps in Module 1 will explain other substitutions as you need them.

Before you start Step-by-Step 1.1, make sure your computer is turned off. When completing the steps, you might need to select your ***username*** (a unique name that identifies you to Windows 8) and enter a ***password*** (a confidential word or phrase), if a password is set for your computer, before Windows displays the Start screen. Selecting a username and entering a password is called ***signing in*** (or logging on), which means to identify yourself to the operating system. If you don't know your username or password, see your instructor for help.

VOCABULARY

Start screen
click
username
password
sign in
tile
scroll bar

Step-by-Step 1.1

1. Turn on your computer by pressing the power button. After a moment, a lock screen might appear displaying a picture, the date, and the time.
2. Press the **Enter** key to display the Welcome screen, which lists you and any other users of your computer.
3. If necessary, click your username, type your password, and then press the **Enter** key. The Windows 8 Start screen appears, as shown in **Figure 1–13**. The Start screen includes rectangles called ***tiles***, which represent software your computer can access. Some tiles, such as the Weather tile, are called live tiles because they show frequently updated information or images. The tiles and their arrangement might differ on your Start screen.

QUICK TIP

If a lock screen does not appear when you turn on your computer, skip Step 2.

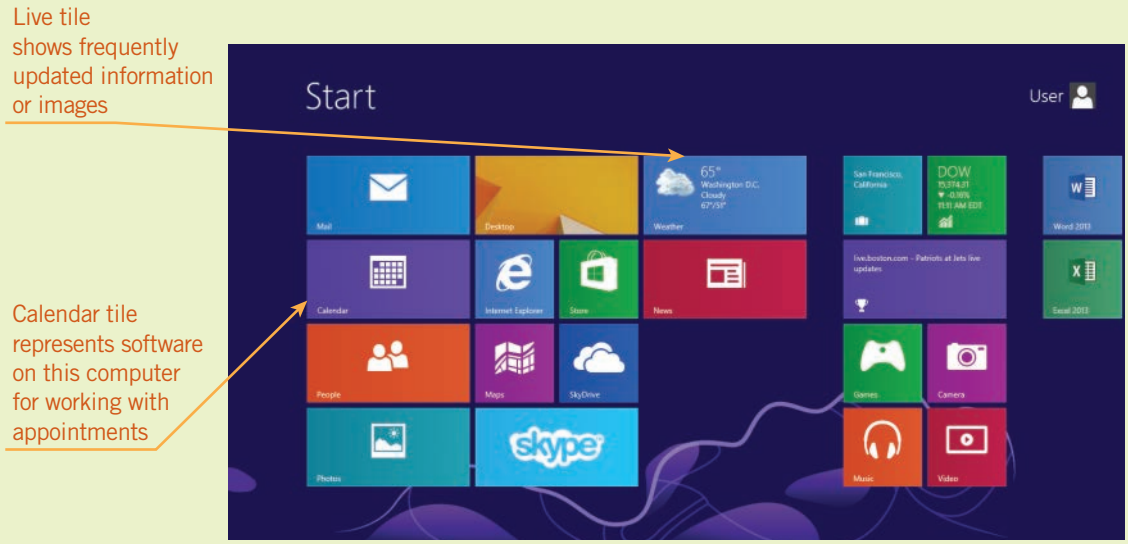


FIGURE 1–13
Windows 8 Start screen

4. Move the mouse to display a scroll bar at the bottom of the Start screen. (A ***scroll bar*** contains arrow buttons and a box you can use to scroll the screen right and left or up and down.)

5. On the scroll bar, click the **right scroll arrow** to scroll the Start screen to the right and display additional tiles.
6. Click the **left scroll arrow** on the scroll bar to scroll the Start screen to the left.
7. Leave the computer running with the Start screen displayed for the next Step-by-Step.

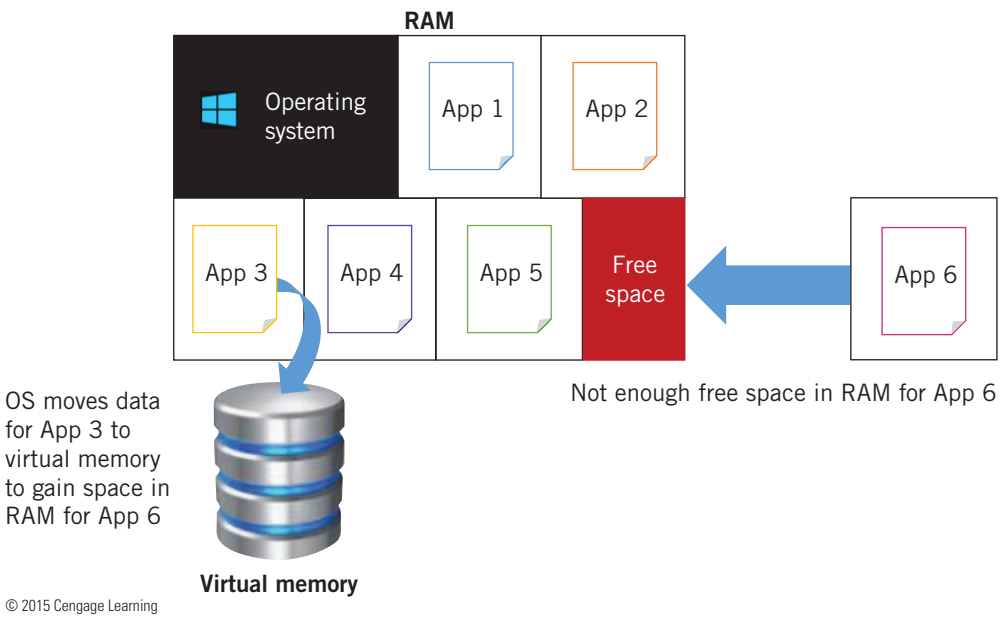
Managing Memory

VOCABULARY
resource
virtual memory
swapping

After starting up, one of the main tasks an operating system performs is managing computer resources. In a computer system, a ***resource*** is any component the system requires to do work. The main resources are memory, processing components, storage space, and peripherals.

An operating system manages memory so that it uses RAM efficiently. RAM is a critical resource because computers have only a limited amount, and every program—applications, utility programs, even the operating system itself—needs space in RAM to run. When you start an application, the operating system allocates RAM to that application. When you close an application, the operating system reclaims the RAM to assign it to another program.

If you run more than one application at the same time, the computer can run out of RAM. In that case, the operating system might close an application or shut down the computer unexpectedly (this is called a crash). To prevent crashes and gain memory, operating systems take advantage of ***virtual memory***, which is part of a computer's hard disk that can work as additional RAM. For example, suppose you have five applications running and then start a sixth application. Windows might have enough RAM to display the user interface for the application, but not enough to allow you to complete any tasks in the application. To gain memory to start the sixth application, Windows moves data from one of the other running applications out of RAM and into virtual memory. This processing is called ***swapping*** and continues until you close one of the open applications. See **Figure 1–14**.



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FIGURE 1–14 Managing memory

In general, as the operating system runs out of RAM for programs, it swaps pages of data from RAM to virtual memory. (A ***page*** is the amount of data and instructions the operating system can swap at one time.) The part of a computer's storage space dedicated to virtual memory is also called the page file or swap file.

Although using virtual memory means the operating system can access more memory than is available in RAM, swapping is slower than using RAM alone. If you notice an application responding more slowly than usual to your commands, the operating system is probably using virtual memory.

VOCABULARY

page

buffer

spooling

Processing Input and Output

Another major task for the operating system is processing input and output. When you type text on the keyboard to provide input to a software application, the operating system accepts and processes the data so the computer can display the text as output on the monitor.

Often, the operating system must handle many input and output tasks at the same time, such as when you click buttons and enter text to create a document, or when you have more than one application running at once. To keep your computer running smoothly, the operating system sets a sequence for processing input and output tasks. For example, if you want to print a large document containing text and graphics, the printer must receive the entire document before it starts printing. Instead of waiting for the printer and slowing down processing, the operating system places the document data into a ***buffer***, part of memory or storage where data waits until it can be transferred to a device. In the meantime, you can continue working with the computer without interruption. When the printer has received the entire document, the operating system removes the data from the buffer. Sending print data to a buffer before printing it is called ***spooling***. See **Figure 1–15**.



OS stores a document to be printed in a buffer

When the printer is ready, the OS releases the document from the buffer

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FIGURE 1–15 Coordinating input and output

In Step-by-Step 1.2, you use two techniques to start and close Windows applications. First, you start the Weather application from the Start screen. When you do, the Weather application takes up the entire screen and provides a clean, uncluttered workspace for viewing weather information. Because of these two characteristics, the Weather application is considered a Windows 8 application, or ***app*** for short. You use a different technique to start Microsoft Word, which is an example of a ***desktop application***, a program that opens and runs in a window on the desktop. The ***desktop*** is the main work area for running productivity applications, especially those created for earlier versions of Windows, such as Windows 7. A ***window*** is a rectangular work area that contains tools for performing work and interacting with the application.

VOCABULARY

app

desktop application

desktop

window

Step-by-Step 1.2

1. If the computer screen is blank or displaying an animated design (called a *screen saver*), move the mouse or press a key to display the Start screen again. You might have to close the lock screen and sign in to Windows as you did in Step-by-Step 1.1.
2. Click the **Weather** tile on the Start screen. The Weather app briefly displays a startup screen (a sun graphic), followed by a full screen of current weather information.
3. If an Enter Location box appears, type **New** to display a list of location names that start with "New," and then click **New York, United States** in the list to display weather information for that location. If an Enter Location box does not appear, your Weather app is already set up to show the weather in a specific location. See **Figure 1–16**.

QUICK TIP

If a message appears asking if you want to allow Weather to use your location, click the Block button.



FIGURE 1–16
Weather app showing information for New York

4. Press the **Windows** key on the keyboard to return to the Start screen. The Weather app is still running though it does not appear on the screen.
5. On the Start screen, type **word** to display a screen similar to the one shown in **Figure 1–17**.

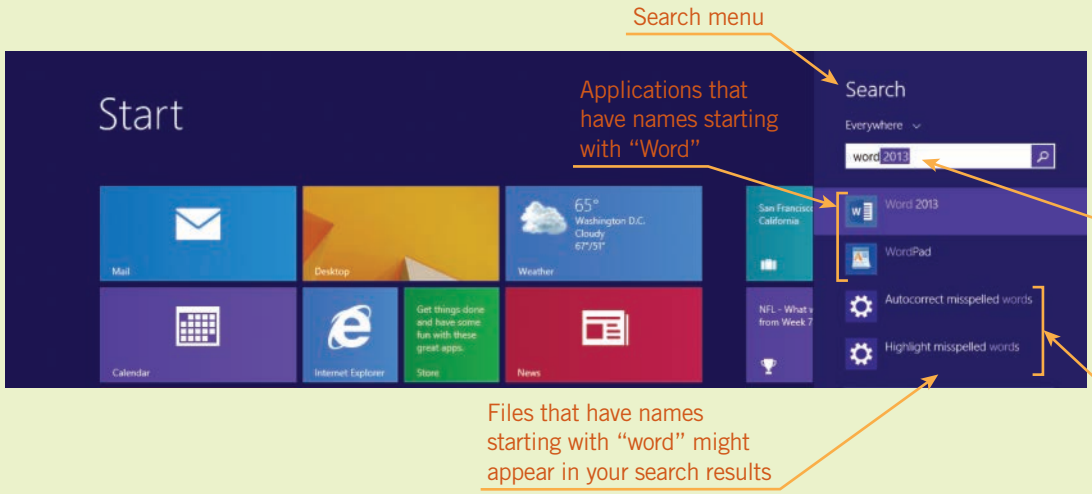


FIGURE 1–17
Using the Search menu to start an application

The panel on the right is called the Search menu, which includes a Search box displaying the text you typed. Below the Search box are the search results, including all types of applications, settings, and files on your computer that have names starting with "word," including Word 2013.

6. Click **Word 2013** in the search results to open the Microsoft Word application on the desktop. See **Figure 1–18**. You explore Word thoroughly in Module 2.

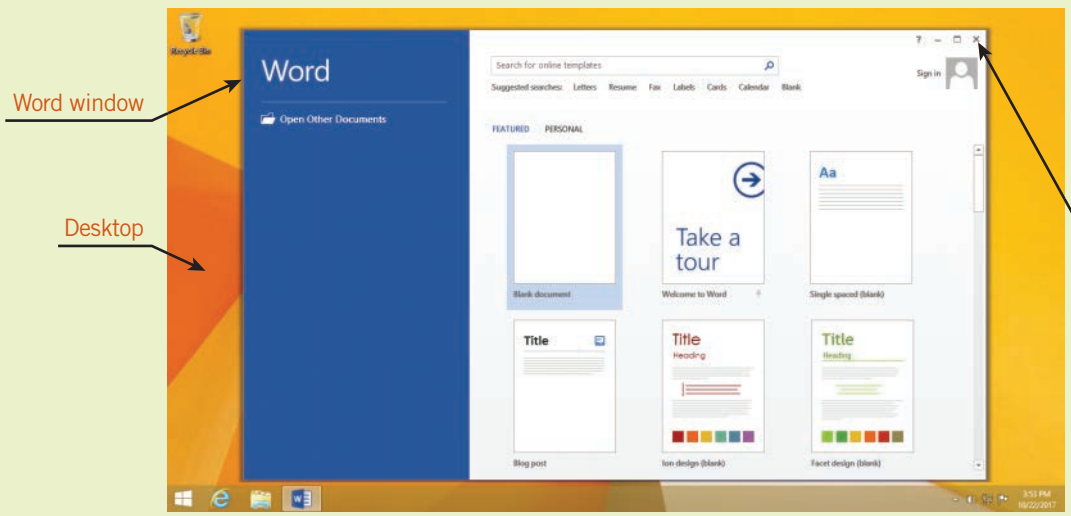


FIGURE 1–18
Word open on the desktop

7. Click the **Close** button in the upper-right corner of the Word window to close the application.
8. Press the **Windows** key to return to the Start screen.

Controlling Hardware

The operating system considers every hardware device connected to the computer as an input or output resource. For example, a microphone is an input resource and a speaker is an output resource, both for audio data such as music and spoken words. To control a hardware resource, the operating system communicates with a ***driver***, also called a device driver, which is a small program that enables the operating system to interact with the device. Each device must have a driver, which is typically provided by the device manufacturer. One of the operating system's setup tasks is to activate the driver for each device connected to the computer so the device works as you expect it to work.

If you install new hardware, such as speakers that plug into your computer, the operating system usually recognizes the device immediately or the next time you start the computer. Because the operating system includes drivers for common devices, it searches for the correct driver on the computer and then installs it so you can use the new hardware right away. This feature is called ***Plug and Play***. If the operating system can't find the right driver on the computer, it typically displays instructions for acquiring and installing the driver software.

VOCABULARY

driver

Plug and Play

Ending a Computer Session



1-1.3.4

A personal operating system needs to know when you're finished working with a computer so it can protect itself and other software and keep your information private while you are away. Although you select an option to end a session, the operating system takes care of the tasks, which range from shutting down, to restarting, signing out (also called logging off), switching users, and locking the computer. The options for signing out and switching users apply only if a computer has more than one user. Shutting down is the only option that turns off the power to the computer. To work with the computer again, you turn on the power and wait for the computer to complete the boot process. So that you can avoid this delay while the computer reboots, operating systems provide alternatives to shutting down such as sleep and hibernate. These are low-power states that the operating system triggers automatically and let you quickly resume work without rebooting. (Lesson 4 discusses these power-saving states in more detail.) **Table 1–2** summarizes the ways to end a computer session.

TABLE 1–2 Ending a computer session

OPTION	DESCRIPTION	WHEN TO USE
Shut down	Completely turns off the computer	You plan to be away from the computer for more than a day or your computer is vulnerable to electrical damage (such as during a lightning storm).
Restart	Closes applications and resets the operating system	You need to reboot the operating system, such as when you install new applications or hardware.
Sign out	Closes applications but keeps the operating system running so another user can sign in without restarting the computer	You share your computer with someone else who wants to use it when you are finished and you are planning to be away for an hour or more.
Switch users	Applications and the operating system continue to run while another user signs in; the other user is not allowed to access your applications or data	You share your computer with someone else who wants to use it briefly.
Lock	Applications and the operating system continue to run, though you cannot access them until you sign in	You are leaving the computer but plan to return to it soon, and want to keep your work and data private.
Sleep/Hibernate	Applications and the operating system continue to run, though in a low-power state	You are leaving the computer but want it to quickly resume working when you return.

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As with the boot process during startup, an operating system follows a procedure to completely shut down. It completes the following steps to make sure all users have saved their data, all applications and system software are stable, and the operating system itself has not developed a problem.

1. *Checks users*—If the computer has more than one user, the operating system checks whether any others are signed in to use the computer. If they are, they might be required to end their sessions before the operating system can shut down.

2. *Closes applications*—The operating system sends a shutdown signal to each running application. If you have not saved data in an application, the operating system gives you a chance to save it before it sends a shutdown signal to the next application. The operating system also clears application data from virtual memory and swaps it to RAM.

QUICK TIP

If you want to turn off the power to a computer, use the operating system's shutdown option to do so. Abruptly cutting off the power by pressing the power button or unplugging a computer can lead to serious system problems.

3. *Closes system software*—The operating system ends the running programs and processes that are part of the system software, making sure they close properly. If the operating system detects a problem, it displays a message now or during the next startup. The operating system also clears data from RAM and buffers.

4. *Turns off the power*—The operating system signals the computer's power management hardware to turn off the power.

VOCABULARY
account

In Step-by-Step 1.3, you explore the Lock, Sign out, and (if possible) Switch account options in Windows 8. In Windows, an ***account*** is a collection of your applications, preferences, and other settings. You can create more than one account on a single computer. Other personal operating systems have similar options for ending a computer session.

Step-by-Step 1.3

1. Point to the upper-left corner of the Start screen to display a thumbnail image of the desktop, and then move the mouse pointer down to display a thumbnail of the Weather app, which verifies the app is still running.
2. Click your **user icon** in the upper-right corner of the Start screen to display a list, or menu, of options. See **Figure 1–19**. Your list might differ.

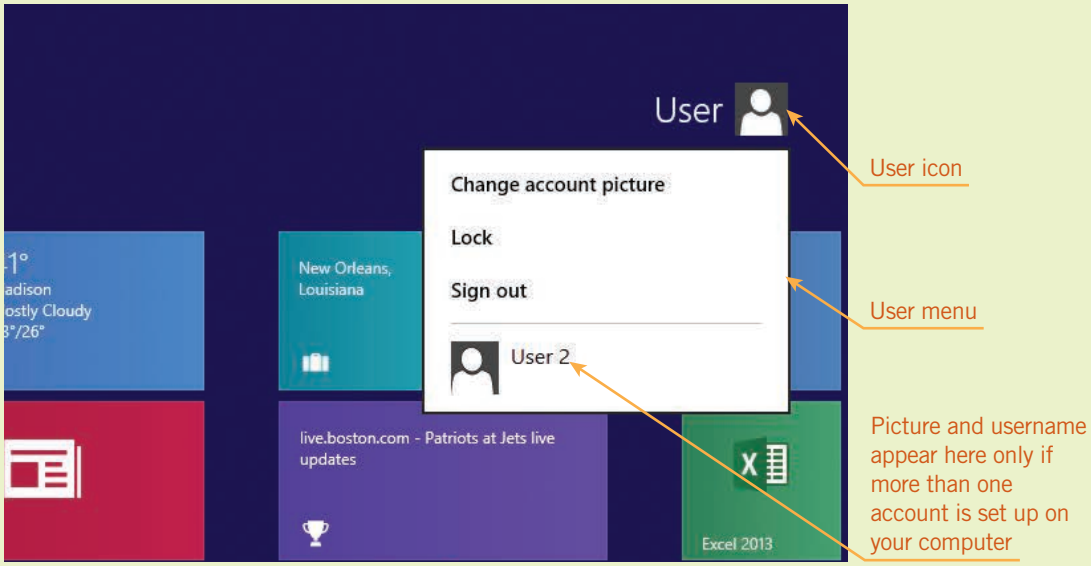


FIGURE 1–19
User icon options

3. Click **Lock** to lock your account and display the lock screen.
4. If necessary, press any key to close the lock screen and display the Welcome screen, and then sign in as you usually do, if necessary.
5. Point to the upper-left corner of the Start screen to display a thumbnail image of the desktop, and then move the mouse pointer down to display a thumbnail of the Weather app, which verifies the app is still running.
6. Click your **user icon** on the Start screen and then click **Sign out**.
7. If necessary, press any key to close the lock screen and display the Welcome screen, and then sign in as you usually do.
8. Point to the upper-left corner of the screen and note that the thumbnails of the desktop and the Weather screen no longer appear, which verifies that Windows closed the Weather app when you signed out.
9. Click your **user icon** again. If the name of another user appears on the list of options (as shown in Figure 1–19), click the **username** to switch users. Windows keeps you signed in to your account, but displays the Welcome screen so you can sign in to a different account.
10. Sign in to a different account, if possible. On the Start screen for the new account, click the **user icon**, and then click **Sign out**. Sign in to your original account to return to the Start screen as you left it in Step 9.

    If you cannot sign in to the new account (because you do not know the password, for example), sign in to your original account.

In Step-by-Step 1.4, you use the Windows 8 shutdown options to put your computer to sleep, wake it up, and then shut it down. To display the shutdown options, you work with the ***Charms bar***, which appears when you point to the upper-right or lower-right corner of the screen. The Charms bar contains buttons called ***charms***. To shut down the computer, you use the Settings charm.

VOCABULARY
Charms bar
charm

Step-by-Step 1.4

1. Point to the lower-right corner of the Start screen to display the Charms bar, and then point to the *Settings* charm. See **Figure 1–20**.

FIGURE 1–20
Charms bar



2. Click the **Settings** charm to display the Settings menu.
3. Click the **Power** button to display the shutdown options on the Power menu. See **Figure 1–21**.

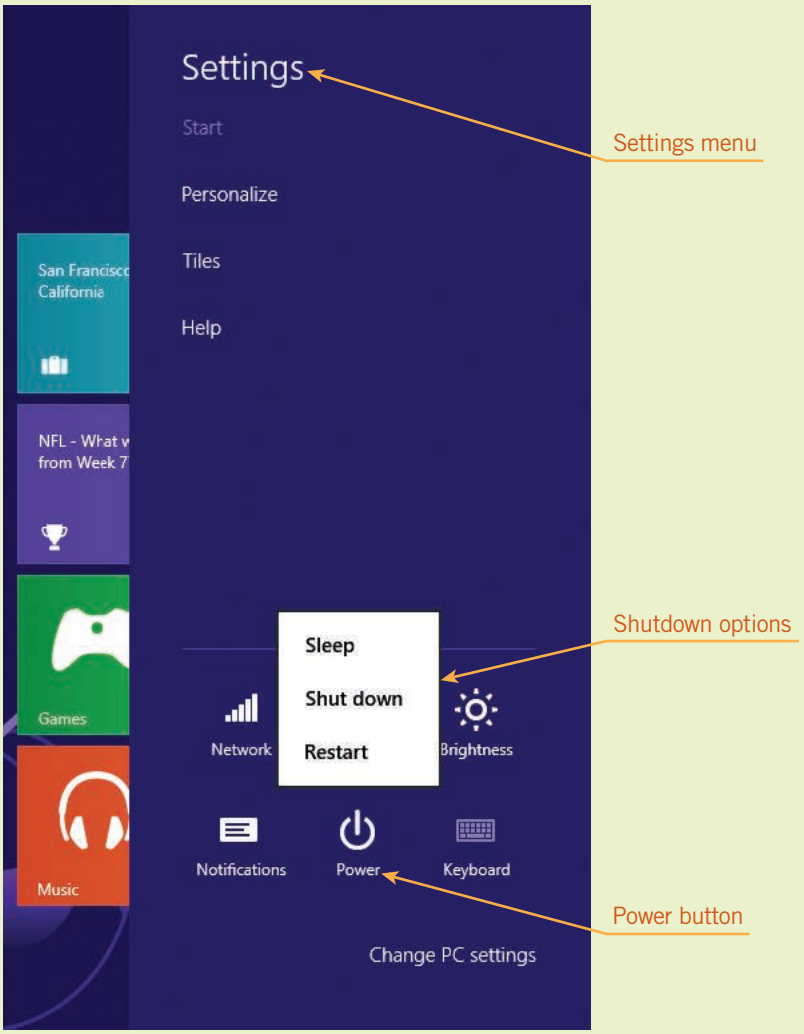


FIGURE 1–21
Windows 8 Power menu

4. Click **Sleep**. Windows 8 puts the computer to sleep. The light in the hardware power button changes color or blinks to indicate the computer is in a sleep state.
5. Move the mouse to wake the computer. If the screen does not change, press the hardware power button to wake the computer. If necessary, close the lock screen and enter your password to display the Start screen.
6. Display the Charms bar again, and then click **Settings** to display the Settings menu.
7. Click the **Power** button, and then click **Shut down**. Windows 8 turns off the computer. If the Power menu includes an option called Update and shut down instead of Shut down, click Update and shut down.

QUICK TIP

If the Sleep option does not appear on the Power menu, your computer might be set to go to sleep only automatically. Click a blank area of the Settings menu, and skip Steps 4–6.



SUMMARY

In this lesson, you learned:

- A computer is an electronic device that receives data (input), processes data, stores data, and produces a result (output).
- A computer includes hardware—physical equipment such as wires and circuits—and software—instructions or programs for controlling the computer.
- To keep up with the changes in computer technology, you need to be computer literate, which means that you can use today's computer hardware and software efficiently to enhance your life and the lives of those around you.
- You interact with software through its user interface, which allows you to enter and receive information. Most contemporary software has a graphical user interface (GUI), which uses icons and other graphics to accept data and commands. Other software uses a command-line interface, which requires you to type text commands to interact with the computer.
- A computer runs two main types of software: system software and application software. System software is the software that runs a computer, and includes the operating system and utility programs. A utility program helps the operating system set up, maintain, and protect a computer.
- An operating system is software that coordinates the resources and activities on a computer.
- Application software is software you use to carry out your work or personal tasks.
- Personal computer operating systems run on personal computers. Mobile operating systems are designed for handheld computers such as tablets and smartphones. Embedded operating systems are part of an electronic device or system other than a computer. Server operating systems run servers, the computers that coordinate networks.
- Single-user, single-tasking operating systems let only one user perform a single task at one time. Most mobile and embedded operating systems fall into this category. Single-user multitasking operating systems let one user run many programs at the same time, and include all personal computer operating systems. Multiuser operating systems such as server operating systems let many users run programs and take advantage of the computer's resources at the same time.
- The technical tasks an operating system performs include completing start-up steps, managing memory, processing input and output, controlling hardware, and ending a computer session.
- The boot process is a series of steps the computer and operating system must complete before you can interact with the operating system.
- The resources an operating system manages include memory (RAM), processing components, storage space, and peripheral devices.
- To supplement RAM, operating systems take advantage of virtual memory, which is part of a computer's storage space that can work as additional memory.
- To keep your computer running smoothly, the operating system sets a sequence for processing input and output tasks and uses buffers, which are parts of memory or storage where data waits until it can be transferred to a device.
- To control a hardware resource, the operating system communicates with a device driver, a small program that tells the operating system how to interact with the device.
- A personal operating system needs to know when you're finished working with a computer so it can protect itself and other software and keep your information private while you are away. Although you select an option to end a session, the operating system takes care of the tasks, which range from shutting down, to restarting, signing out (also called logging off), switching users, and locking the computer.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The information processing cycle includes steps for handling input, processing, output, and storage.

T F 2. Hardware is what makes a computer useful, not the software.

T F 3. The purpose of application software is to operate and control computer hardware by running utility programs.

T F 4. One step in the boot process is to perform the power-on self-test (POST), which makes sure critical system components are working properly.

T F 5. All personal computer operating systems are considered multiuser operating systems.

MULTIPLE CHOICE

Select the best response for the following statements.

1. Four popular _____ operating systems include iOS, Android, Windows Phone, and Windows RT.
   - A. personal
   - B. mobile
   - C. server
   - D. network
2. In a computer system, a _____ is any component the system requires to do work.
   - A. user interface
   - B. utility program
   - C. resource
   - D. platform
3. A _____ operating system lets you work with more than one program at the same time.
   - A. multitasking
   - B. multiuser
   - C. single-user
   - D. command-line
4. _____ is the only way to end a computer session by turning off the power to the computer.
   - A. Signing out
   - B. Shutting down
   - C. Locking
   - D. Restarting
5. When data is processed into a meaningful form, it becomes _____.
   - A. information
   - B. input
   - C. storage
   - D. memory

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. How does a computer follow the information processing cycle to perform tasks?

2. What does it mean to be computer literate?

3. What is the purpose of an operating system?

4. What is the difference between system software and application software?

5. Why is managing memory one of an operating system's most important tasks?

6. How does an operating system's Plug and Play feature work?

7. What is the difference between signing out and locking the computer?

8. What is the difference between a command-line interface and a graphical user interface?

9. What does it mean that Linux is open-source software?

10. What is an embedded operating system and where would you find one?

PROJECTS

PROJECT 1–1



1-1.1.1

In this project, you start Windows 8, explore the Start screen, and answer questions about what you find. Submit the written answers as your instructor requests.

1. Start Windows 8 and sign in, if necessary.
2. Examine the tiles on the Start screen, and then scroll the Start screen as far as possible to the right. What differences do you notice between the tiles on the far-left and far-right sides of the Start screen?
3. Scroll back to the far left side of the Start screen, and then click the **Desktop** tile. Describe what happens.
4. Return to the Start screen. What technique did you use?
5. Scroll the Start screen to the right until a Word 2013 tile appears. (If a Word 2013 tile does not appear, continue with the step.) Start Word 2013. What technique did you use?
6. Return to the Start screen, and then click the **Desktop** tile. How is the desktop different from the one that appeared when you performed Step 3?
7. Start the Weather app. Describe the steps you performed.
8. Return to the Start screen, and then switch between the Start screen and the desktop a few times. What is the purpose of each location in the Windows 8 operating system?
9. Close Word 2013. Describe the steps you performed.
10. Return to the Weather app, and then close it by pressing the Alt+F4 keys.
11. In Step-by-Step 1.4, you shut down Windows. How is shutting down an operating system different from closing an application?

PROJECT 1–2



1-1.1.1

In this project, you start Windows 8 apps and desktop applications, and then answer questions about your activities. Submit the written answers as your instructor requests. Some steps require you to perform new tasks or solve problems independently.

1. Start Windows 8 and sign in, if necessary.
2. Examine the tiles on the Start screen and use one to start an app that lets you track appointments and display current, future, and past dates. Which app did you start?
3. Describe the app you started.
4. Experiment with the app and try to discover how to enter information. What did you learn?
5. Start another app that displays a map of the United States or other location. What app did you start?
6. Describe the app you started.
7. Experiment with the app and try to discover how to interact with it. What did you learn?
8. Start Word 2013. How does this application differ from the two apps you started?
9. Close Word, and then close the two other apps you started using the Alt+F4 keys.

PROJECT 1–3



1-1.1.2

Windows includes a feature called Windows Help and Support that provides instructions, demos, and other information to help you perform operating system tasks. In this project, you use Windows Help and Support to learn more about the Windows 8 shutdown options, and then answer questions about what you learned. Submit the written answers as your instructor requests.

1. Start Windows 8 and sign in, if necessary.
2. On the Start screen, type **help** to open the Search menu with "help" already entered in the Search box.
3. Click **Help and Support** in the search results. The Windows Help and Support window opens on the desktop.
4. Click the **Search** box at the top of the window. Type **shut down**, and then press the **Enter** key. A list of Help topics containing the words "shut down" appears in the Windows Help and Support window.
5. Click the **How do I shut down (turn off) my PC?** topic. (If this topic does not appear in the list, click a topic with a similar title.) Watch the video and then read the steps and explanations. Describe the information covered in this topic.
6. Click the **Search** box at the top of the window. Type **lock** and then press the **Enter** key.
7. Click the **How do I lock or unlock my PC?** topic. Read the steps and explanations. Describe the information covered in this topic.

TEAMWORK PROJECT

You work at a small graphic design company as a project assistant. The company uses old computers running Windows XP. Your manager wants to purchase new computers for the company, and is willing to buy personal computers running the latest versions of Windows, Mac OS X, or Linux. She asks you and two team members to help her make the decision. Work as a team of three to complete the following steps.

1. Develop a checklist of features to evaluate for each operating system, such as price, ease of use, application software availability, security, and built-in tools.
2. Assign an operating system to each team member.

1-1.1.2

3. Use the Internet and other resources to research your operating system, focusing on the features you identified in your checklist.
4. Collaborate as a team to create a table or report summarizing your findings for the three operating systems. Submit the document as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 1–1

1-1.1.1

This lesson emphasizes that the operating system is mainly concerned with system tasks, while application software helps you perform your work or personal tasks. How often do you interact directly with the operating system? How much do you use application software?

1. During a period of 2–5 days, keep a log of your computer activities. Record what you are doing on the computer and for how long. Note whether you are using the operating system or application software to perform these tasks.
2. Review and edit your log to make it as accurate as possible. Estimate the percentage of time you spent using the operating system and using application software.
3. Submit the log as your instructor requests.

CRITICAL THINKING 1–2

1-1.1.2

In this lesson, you explored several ways to end a computer session, including signing out, locking the computer, switching users, letting the computer go to sleep, restarting, and shutting down. Which method would you choose in the following situations?

1. For each of the following situations, indicate how you would end a Windows session and why.
   - You are going on vacation for five days.
   - You are using a computer in a café to work on a project you want to keep private. You want to leave the computer for a few minutes while you order a hot beverage.
   - You installed a new application and are instructed to reboot.
   - You share a computer with your roommate, who wants to briefly check her e-mail while you are working on the computer.
   - You share a laptop with your brother and are finishing an assignment before you head off to your part-time job.
   - You are finished working on your computer for the day, but want it to resume quickly when you use it again in the morning.
2. Submit the answers as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 1–1

Android is currently the most widely used operating system for smartphones. Research Android on at least two Web sites and then answer the following questions. Submit the written answers as your instructor requests.

1. When was the first Android smartphone sold?
2. Android is open-source software released under the Apache License. What exactly does this mean?
3. What is the main location for downloading apps that run on Android? Give a few examples of Android apps you can download.
4. Instead of a Start screen or desktop, Android has a home screen. What typically appears on an Android home screen?
5. Describe the naming convention for Android versions.

ONLINE DISCOVERY 1–2

Shortly before Apple released the first Macintosh computer running Mac OS, Apple designed and released a similar computer called the Lisa. Research the Apple Lisa on at least two Web sites, and then answer the following questions. Submit the written answers as your instructor requests.

1. When did Apple begin to sell the Lisa computer? What types of customers did Apple want the Lisa to attract?
2. What operating system did the Lisa run?
3. The operating system on the Lisa was advanced for its time, but had some major drawbacks. Describe at least one of these drawbacks.
4. Was the Lisa a commercial success or failure? Explain why.
5. What kind of user interface did the operating system run?
6. Eventually, Apple reintroduced the Lisa as the Macintosh XL. What operating system did the Macintosh XL run?

JOB SKILLS

If you like working with operating systems, you can work as a computer support specialist to help people use personal and mobile computers. Working as a computer support specialist is a good way to start a career in the technology field. However, this position demands a special blend of skills to be successful and earn promotions. Work with a group or on your own to research this job and then answer the following questions. Submit the written answers as your instructor requests.

1. What do computer support specialists do?
2. List the skills needed to be an excellent computer support specialist.
3. In which areas are your skills the strongest? Where do you need to improve?
4. What parts of this job do you find attractive and why?

EXPLORE AND SOLVE

Did you know?

- You can change the appearance of the Windows lock screen, user icon, and Start screen.
- The user icon is also called the account picture.

1. From the Start screen, display the Settings menu, and then click **Change PC settings**.
2. On the right, click **Lock screen**, examine the settings, click the **Back** button (next to "PC and devices" on the left), click **Account picture**, and then examine the settings.
3. Press the **Alt+F4** keys to close the PC settings screen. Display the Settings menu, and then click **Personalize** to display options for personalizing the Start screen. Click a blank area of the Start screen to close the Personalize menu.
4. In a written document, describe how you can customize each of these features.
5. Submit the document as your instructor requests.



Estimated Time:
1 hour

LESSON 2

Software and Hardware Interaction

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Identify hardware components that affect computer performance.
- Explain how the central processing unit (CPU) processes software instructions.
- Describe types of computer memory.
- Explain how to use system requirements.
- Explain the purpose of software updates.
- Use Windows Update to keep the operating system up to date.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

arithmetic/logic unit (ALU)
byte
cache
central processing unit (CPU)
circuit board
clock speed
control unit
execution cycle (E-cycle)
gigahertz (GHz)
instruction cycle (I-cycle)
machine cycle
megahertz (MHz)
motherboard
multicore processor
multiprocessing
multithreading
nonvolatile memory
read-only memory (ROM)
register
system unit
thrashing
volatile memory

Microsoft product screenshots used with permission from Microsoft Corporation.

As you use a computer, you are probably aware of how quickly it responds to your commands and performs other software tasks. How efficiently a computer performs is determined by its internal hardware components. This lesson explores the interactions between hardware and software to process data and perform other basic tasks. You'll start by identifying the major hardware components that affect performance, and learn how a component's characteristics determine the software you can use on your system. You'll also examine how to keep your operating system up to date, ensuring your computer and its devices work smoothly together.

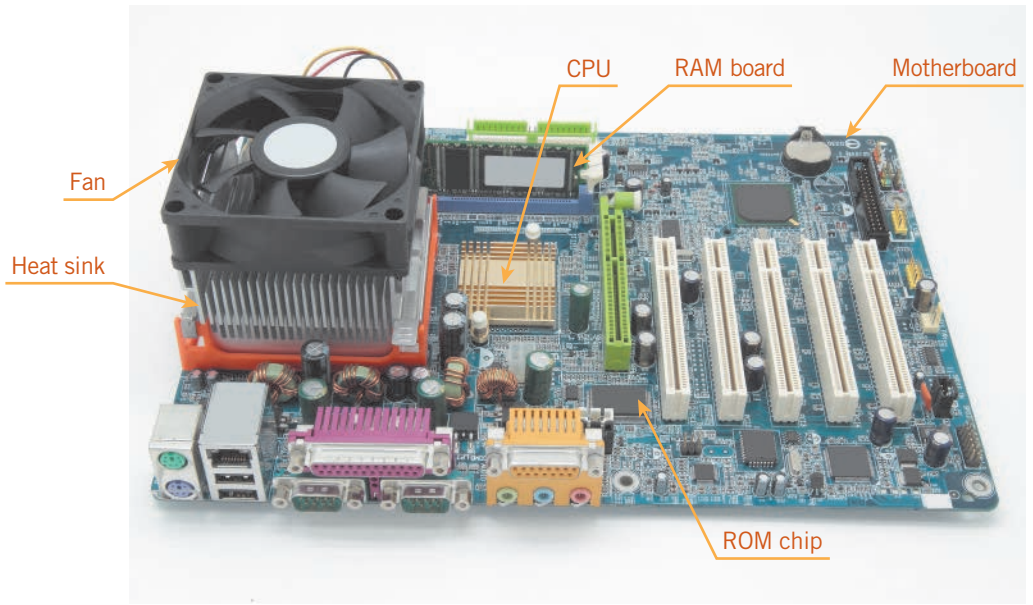
IC3
1-1.1.3
1-2.1.1
1-2.1.2
1-3.3.1

Identifying Hardware Components in a Computer

VOCABULARY
performance
system unit
motherboard
circuit board

At the most fundamental levels of a computer, the operating system interacts with internal hardware components to perform its computing tasks. How efficiently hardware and software complete these tasks is called ***performance***. Because a computer's internal hardware components directly influence its performance, you should be familiar with these components and how they work together to process instructions from software.

The ***system unit*** is the case that contains a computer's main system components, including the processor, memory, and the computer's main circuit board, which is called the ***motherboard***. A ***circuit board*** is a thin metal plate or board with an extensive electronic circuit. All of the essential chips and the circuitry that connects them are on the motherboard. See **Figure 2–1**.



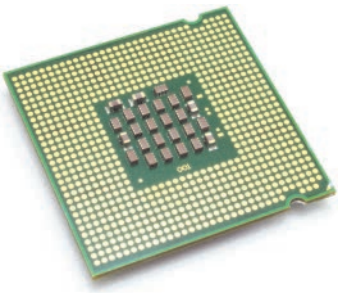
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FIGURE 2–1 Motherboard in the system unit

Central Processing Unit

1-2.1.1

The main processing device in a computer is the ***processor***, also called the microprocessor, and the ***central processing unit (CPU)***, a single computer chip that contains all the electronic circuitry a computer needs to process data, making it the most important hardware component in a computer. A ***chip*** is a small, thin piece of silicon containing electronic circuits, which is why a chip is also called an integrated circuit (IC). The processor has a significant effect on a computer's performance and computing power. **Figure 2–2** shows a typical CPU.



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FIGURE 2–2 CPU

VOCABULARY

processor

central processing unit (CPU)

chip

arithmetic/logic unit (ALU)

control unit

register

ABOVE AND BEYOND

In 1971, Intel Corporation introduced a portable calculator that contained the first commercially available processor. Called the 4004, the processor could add and subtract numbers, but it could not do much else. Even so, the 4004 signaled a revolution in computing because on a single chip, it integrated all the electronic circuitry necessary to process data. Rather than reconfiguring an entire circuit board, engineers could easily customize a single-chip processor with software to perform tasks on a wide range of electronic devices.

Parts of a CPU

The CPU has two primary sections: the arithmetic/logic unit and the control unit. The ***arithmetic/logic unit (ALU)*** performs arithmetic calculations and logical operations. The calculations include addition, subtraction, multiplication, and division. The logical operations involve comparisons, such as determining if two numbers are equal or if one number is greater than or less than another number. These might seem like simple operations. However, by combining them, the ALU can execute complex tasks. For example, if you are playing a video game on your computer and earn points when you complete an action, the game software instructs the ALU to add those points to your previous score to compute your new score. The game software might also instruct the ALU to compare that score to other scores you recorded to determine whether your new score is the highest one you achieved.

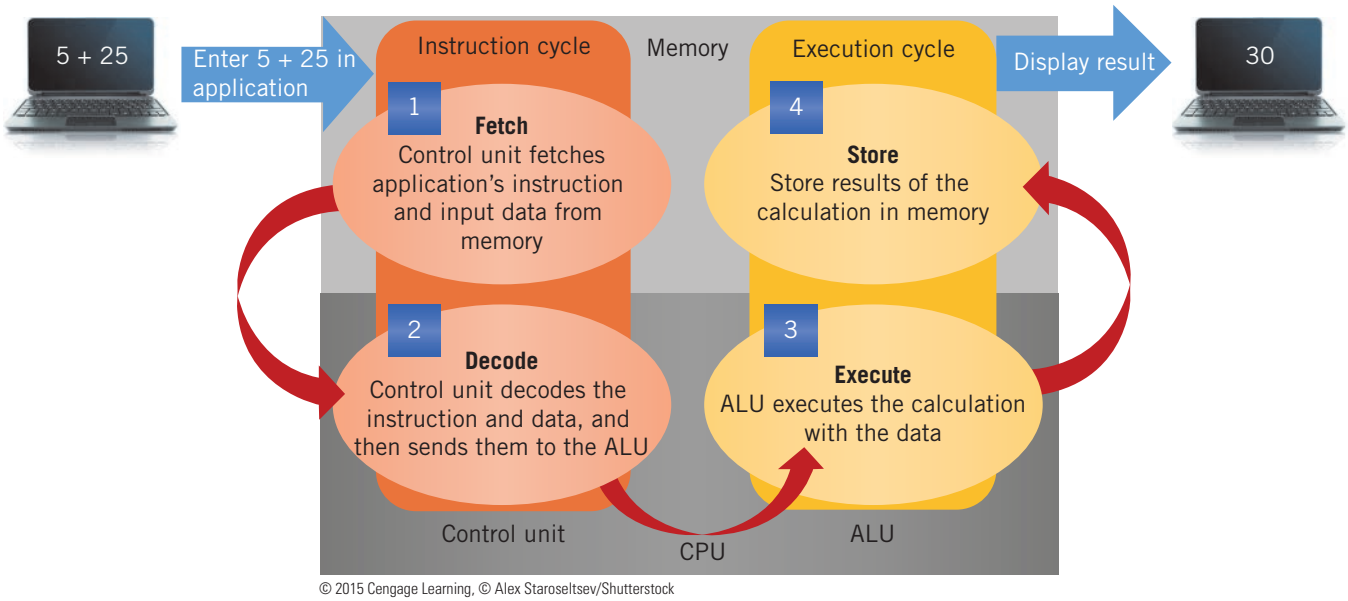
The ***control unit*** coordinates all of the processor's activities and manages the flow of information through the processor. The control unit interprets each instruction it receives from software, and then triggers the appropriate action to carry out the instruction. For example, if an application includes an instruction to multiply two numbers, the control unit directs the task to the ALU, which performs the calculation.

The CPU also contains memory cells for temporarily storing data, including the ***registers***, which mainly store the basic data the ALU needs to perform its calculations and the results of those calculations.

Machine Cycle

VOCABULARY
machine cycle
instruction cycle (I-cycle)
execution cycle (E-cycle)
clock speed

When software sends an instruction to the CPU, the CPU carries out the instruction by repeating four basic operations in the ***machine cycle***: (1) fetching, (2) decoding, (3) executing, and (4) storing. Fetching retrieves an instruction or data item from memory, and decoding translates the instruction into a form the computer can execute. The fetching and decoding operations make up the ***instruction cycle (I-cycle)***. Executing carries out the commands in the instruction, while storing, in this context, means writing the result to memory (not to a storage medium). The executing and storing operations make up the ***execution cycle (E-cycle)***. See **Figure 2–3**.



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FIGURE 2–3 Machine cycle

For example, if software needs to add two numbers, as shown in Figure 2–3, it sends that instruction (add two numbers) and the input data (5 + 25) to memory, where the control unit in the CPU fetches them. The control unit completes the instruction cycle by decoding the instruction and data, and then passing them to the ALU. When the ALU receives the instruction and data, it executes the calculation, and then completes the execution cycle by storing the result (30) in memory. The software can retrieve the result and use it, such as by displaying it on the screen.

Clock Speed

Machine cycles are measured in microseconds (millionths of a second), nanoseconds (billionths of a second), and even picoseconds (trillionths of a second) on some large computers. The faster the machine cycle, the faster your computer processes data. The speed of the processor directly influences the speed of the machine cycle, and therefore, the overall performance of the computer. The processor's speed is also called the ***clock speed***, which indicates the number of instructions the CPU can process per second.

Every computer has a system clock that generates a regular electronic beat to set the pace and timing of system operations. Each beat of the system clock is called a cycle. For contemporary CPUs, clock speed is stated in ***megahertz (MHz)***, or a million cycles per second, and ***gigahertz (GHz)***, or a billion cycles per second. (A *hertz* is one cycle per second.) A CPU that runs at 2 GHz completes 2 billion clock cycles in one second.

Bit Size

CPU clock speed is only one measure of CPU performance. Another measure is ***bit size***, which indicates how many bytes of data the CPU can retrieve from RAM at once. A ***byte*** of data is roughly equivalent to one character, such as x. An 8-bit CPU can process 1 byte at a time, while a 16-bit CPU can process 2 bytes at a time. Modern CPUs are 32-bit (4 bytes at once) and 64-bit (8 bytes at once) processors.

Types of Processors

The type of processor also significantly affects its performance and the performance of the computer overall because it determines how quickly the computer can accept and carry out instructions from software. Different types of processors can use different techniques to process data and instructions as they complete the machine cycle.

A ***multicore processor*** is a single chip that contains more than one processor, and includes dual-core processors (two processors on one chip) and quad-core processors (four processors on one chip). If your operating system is designed to run with a multicore processor, its processors can boost the speed of the software so that it responds more quickly to your commands, especially when you are running multiple programs at the same time.

If a computer has a multicore processor, the operating system can use ***multiprocessing*** to split tasks among the processors. With multiprocessing, each processor can work on a different task at the same time, which improves performance. In contrast, older computers and mobile computers often have a single-core processor, so they cannot use multiprocessing. To enhance performance using a single-core processor, the operating system can use two other techniques: multitasking and multithreading. Recall from Lesson 1 that a multitasking operating system can run more than one program at the same time. With ***multithreading***, the operating system handles many parts, or threads, of a single program. For example, displaying a document and printing it are two threads in a word-processing program. Although the operating system still performs tasks in sequence rather than simultaneously, multitasking and multithreading are the most efficient processing techniques an operating system can use with a single-core processor.

In short, on a computer with a multicore processor, the operating system can use multiprocessing, multitasking, and multithreading to improve performance. On a computer with a single-core processor, the operating system can use only multitasking and multithreading.

VOCABULARY

megahertz (MHz)

gigahertz (GHz)

bit size

byte

multicore processor

multiprocessing

multithreading

ABOVE AND BEYOND

The International System of Units established the hertz (Hz) as a unit that measures frequency and named it after Heinrich Hertz, a German physicist. As with all units named after a person, the first letter of the symbol is always uppercase. The hertz replaces the older term "cycles per second."

ABOVE AND BEYOND

Although most personal computers with multicore processors can improve performance through multiprocessing, very large, powerful computers called *supercomputers* use a similar technique called *parallel processing*. Rather than dividing tasks among processors, parallel processing assigns independent parts of the same task to different processors, which work on each part simultaneously. Of all the processing techniques, parallel processing can provide the greatest boost to performance.

Suppose you are using your computer to work on a presentation and you begin by starting a presentation application, such as Microsoft PowerPoint. You want to check some information online, so you open a Web browser (an application for visiting Web sites and displaying Web pages), and then navigate to the page you need. As you review the Web page, you check your e-mail, and then return to the presentation application to enter information based on what you learned. This typical scenario involves five major tasks: start a presentation application, open a Web browser, navigate to a Web page, check e-mail, and then enter information in the presentation. **Figure 2–4** compares how these tasks are accomplished with an operating system using a single-core processor versus a multicore processor. With a single-core processor, shown at the top of Figure 2–4, the operating system completes the five tasks in five steps, performing one task in each step. With a multicore processor, shown at the bottom of Figure 2–4, the operating system can complete the five tasks in only three steps by working on some tasks at the same time. Processor 1 begins to open the presentation application, and then Processor 2 begins to open the Web browser. When both applications are open, Processor 1 checks e-mail while Processor 2 displays Web pages. When Processor 1 is finished checking e-mail, it accepts information from the user and enters it in the presentation while Processor 2 is still displaying Web pages. When Processor 2 finishes displaying Web pages, it is ready for the next task, which it can start while Processor 1 is busy entering information in the presentation.

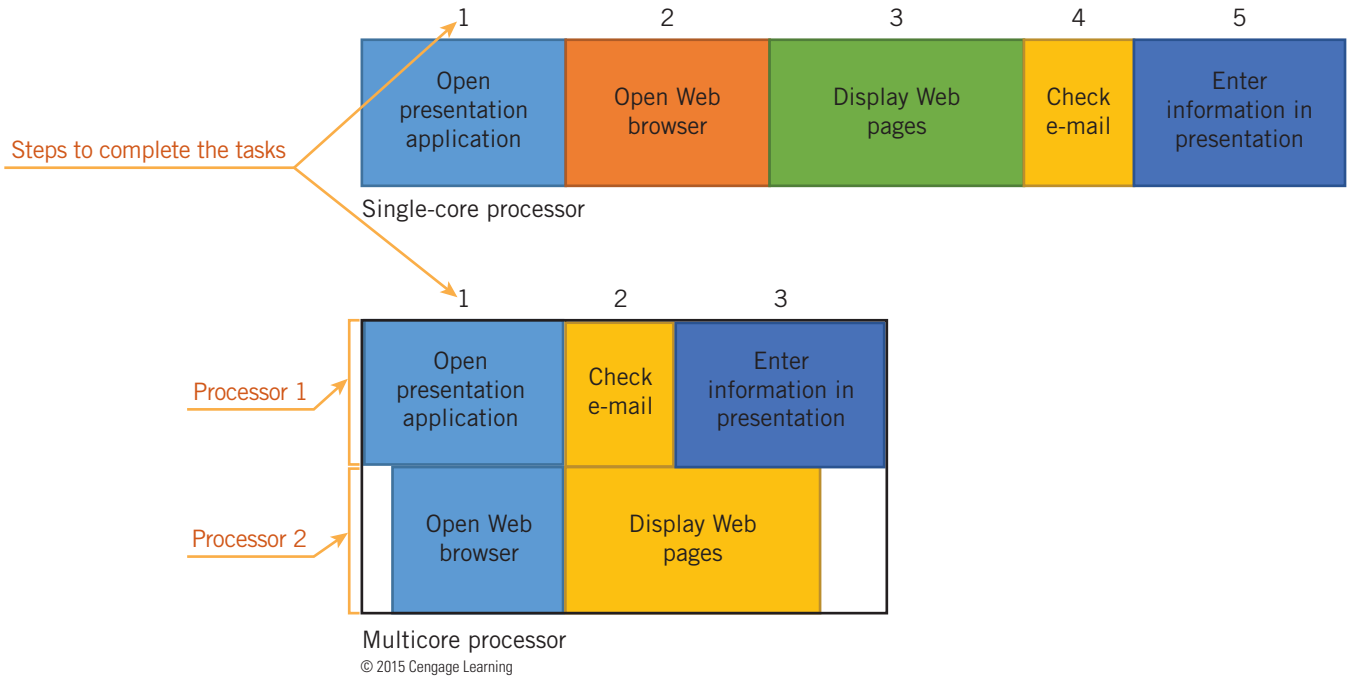


FIGURE 2–4 Performing tasks with a single-core and a multicore processor

Currently, three major companies produce most of the CPUs for computers, including servers, personal, and mobile computers. Intel and AMD manufacture processors for computers ranging from powerful servers to lightweight tablets. ARM Holdings produces ARM processors, which are exclusively for mobile computers.

The processor manufacturer also defines a computer's platform. For example, a PC platform is a personal computer that includes a processor made by Intel or AMD and runs the Windows operating system. For this reason, the PC platform is sometimes called the Windows platform.

Many Macs now have an Intel processor, which allows you to run some Windows and Linux software. The Linux platform uses a standard PC or Mac and does not require a certain type of processor, though it runs only software designed for the Linux operating system.

Memory



1-2.1.2

To store data and instructions, the CPU, operating system, and applications use memory, which consists of chips inside the system unit. A computer has two major types of memory: volatile and nonvolatile. RAM is the most common type of ***volatile memory***, which loses its contents when you turn off the power to the computer. ROM is an example of ***nonvolatile memory*** because it is permanent; it does not lose its contents when you turn off the power to the computer.

VOCABULARY

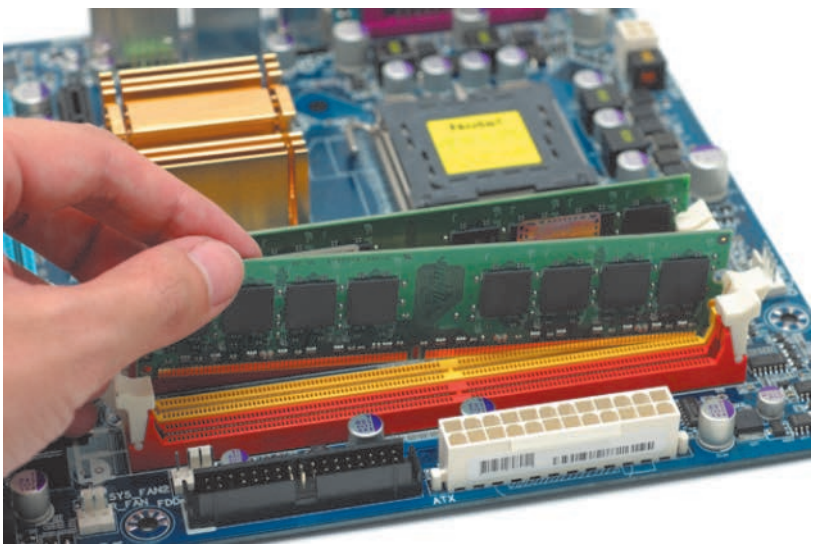
volatile memory

nonvolatile memory

thrashing

RAM

RAM is short-term memory, also called main memory and primary memory. Data, information, and instructions from applications and the operating system are stored temporarily in RAM, which is usually several chips on a circuit board called a memory module that is plugged into the motherboard. **Figure 2–5** shows a person installing a set of RAM chips on the motherboard.



© Norman Chan/Shutterstock

FIGURE 2–5 Installing RAM chips

The amount of RAM in your computer has a significant effect on performance. If you have plenty of RAM, the operating system can manage memory easily and provide RAM as the CPU and applications request it. If you do not have enough RAM, the operating system must move data in and out of RAM frequently, which slows performance. The operating system can even spend more time swapping data between RAM and virtual memory than running software, a condition called ***thrashing***. A computer with a thrashing operating system is sluggish or completely unresponsive.

ABOVE AND BEYOND

You can tell that an operating system is thrashing if the computer does not respond when you press keys or move the mouse. You might also hear a soft grinding sound or the computer fan running constantly. To stop the thrashing, restart the computer by pressing the Ctrl+Alt+Del keys at the same time. If that doesn't work, press the power button to turn the computer off. If the operating system continues to thrash, you probably need to purchase and install additional RAM.

ROM

VOCABULARY

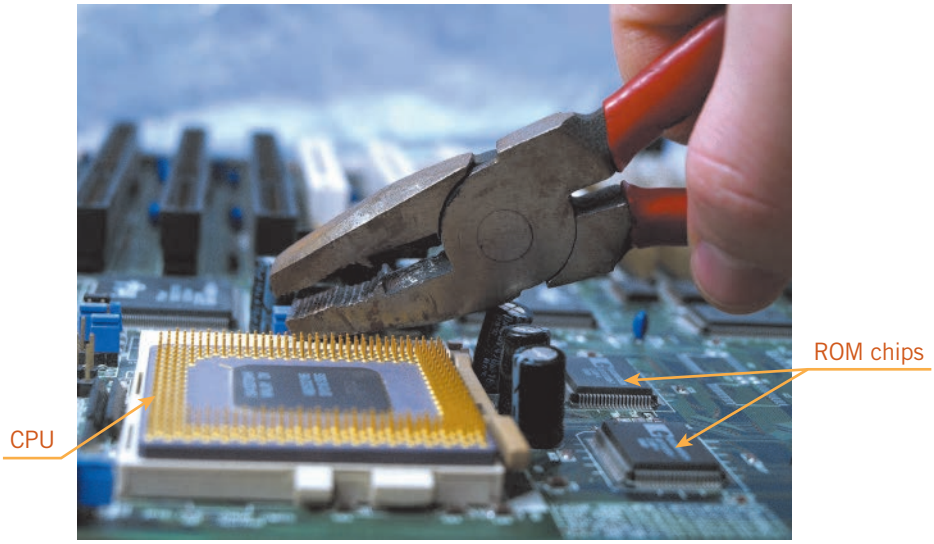
read-only memory (ROM)

electrically erasable programmable read-only memory (EEPROM)

flash memory

firmware

In contrast to RAM is ***read-only memory (ROM)***, which is stored on single chips on the motherboard, as shown in **Figure 2–6**. The operating system retrieves the data or programs stored in ROM when it needs them, such as when the computer starts up. Unlike RAM, however, the operating system does not regularly write over the contents of ROM, which is why this type of memory is called read-only memory.



© Andrr/Shutterstock

FIGURE 2–6 ROM chips on the motherboard

Electrically erasable programmable read-only memory (EEPROM) is a type of ROM that is nonvolatile, but can be modified. ***Flash memory*** is a type of ROM that can be updated much more quickly than EEPROM and has largely replaced standard ROM in current computers, though all are sometimes called ROM. Because flash memory is so much faster than ROM or EEPROM, it is now being used on mobile computers and peripheral devices to store data such as songs and phone numbers.

Recall from Lesson 1 that the BIOS is stored on a ROM chip, and it contains instructions for starting the computer before the operating system is loaded. Because the ROM chip stores these instructions permanently, the chip is often called ***firmware***, a hybrid of hardware and software.

If you change system components on your computer, by adding RAM, for example, the BIOS must be updated to take the configuration changes into account. Some operating systems update the BIOS on the ROM chip automatically when you install the new hardware. In other cases, you or a computer technician can use the BIOS setup utility to make the changes, though you should do so cautiously. Selecting an incorrect setting could mean that your computer can no longer start.

Caches

In addition to RAM, the CPU accesses memory ***caches*** (pronounced *cashes*) to speed processing. Because it takes longer to transfer data stored in RAM to the CPU than it takes the CPU to actually process the data, the CPU bypasses this bottleneck by storing a small amount of memory on the CPU itself, apart from the registers, where it is almost instantly available. This small amount of memory is called ***level 1 cache*** memory.

Instead of waiting for data from RAM, the CPU also uses a larger amount of memory called ***level 2 cache*** memory. This memory can reside on the CPU itself or on a chip that has a direct connection to the CPU.

So far, you've learned about RAM, ROM, registers, and caches, which are types of memory for storing data. All of these elements fit together in a hierarchy, as shown in **Figure 2–7**. The closer instructions and data are to the CPU, the faster the CPU can process them.

VOCABULARY

cache

level 1 cache

level 2 cache

heat sink

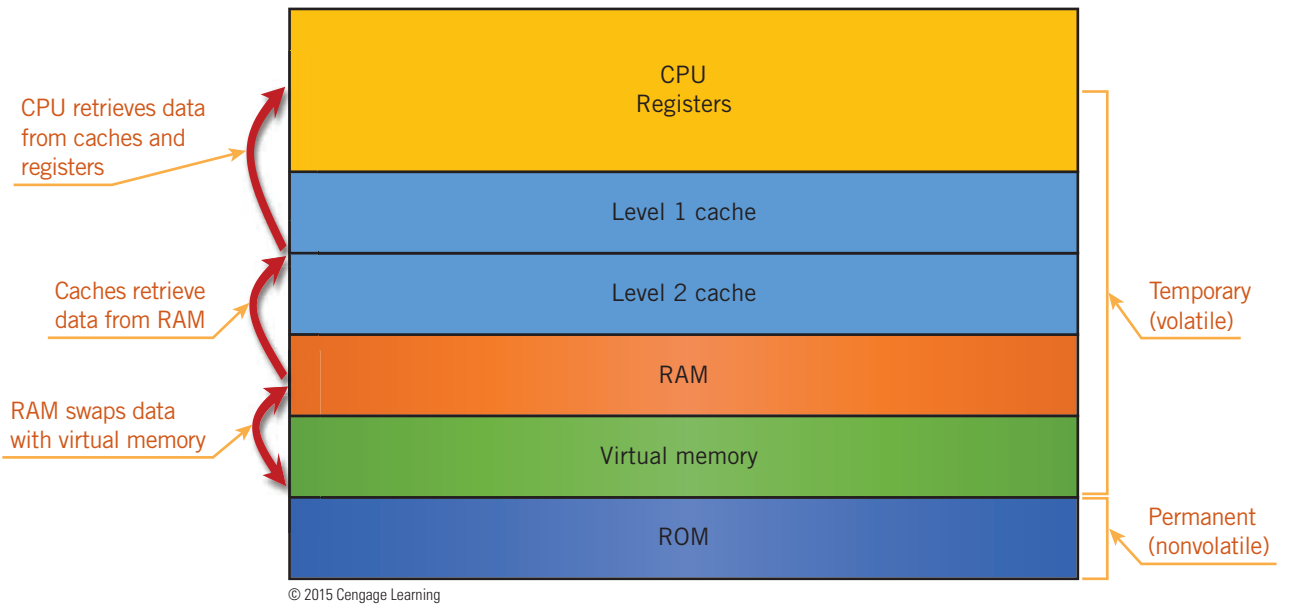


FIGURE 2–7 Making data available to the CPU

Heat Sinks and Fans

Other hardware that indirectly affects computer performance are those that keep a computer cool. As components in the system unit receive power, they heat up. Processors in laptops, desktops, and servers generate a lot of heat. If these electronic components get too hot, they can cause damage to the component and instability to the system. As the temperature increases, the system slows down to avoid overheating, which severely impairs performance. To prevent overheating, one or more fans in the system unit draw cooler air into the case from the outside and expel warm air from the inside to keep the temperature within an ideal range. In many instances, such as the motherboard shown in Figure 2–1, the fan moves air across a ***heat sink***, which collects heat from an electronic component so the fan can cool it quickly.

QUICK TIP

Most tablets do not include fans because they have low-voltage components and no moving parts that are designed to remain cool as the computer runs.

Performance Indicators

1-1.1.3

You can tell how efficiently a computer is working by tracking its CPU and RAM usage. The lower the usage, the more efficiently the operating system is performing tasks. You can track CPU and RAM usage in Windows by using Task Manager, which is a tool that advanced Windows users work with to diagnose computer problems. Much of the information it provides is very technical and useful only to computer technicians. However, Task Manager also gives you a behind-the-scenes glimpse at how Windows is interacting with hardware resources and other software. In Task Manager, the tasks the processor handles are called processes. In Step-by-Step 2.1, you start Microsoft Word and Internet Explorer (the Web browser provided with Windows), and then open Task Manager to display the current processes and determine how many CPU and RAM resources Word and Internet Explorer are using.

Make sure the computer is turned on and you are signed in to Windows (if necessary) before you complete any of the Step-by-Steps in this lesson. In the following steps, you right-click the taskbar to display a shortcut menu. If you are using a mouse, point to the taskbar and then press the right mouse button to right-click. If you are using a touchscreen, press and hold the taskbar until the shortcut menu appears.

QUICK TIP

In Mac OS X, you use a tool called Activity Monitor to display CPU and RAM usage. In Linux, you enter the top command at the command line to display the same information.

Step-by-Step 2.1

1. On the Start screen, begin to type **Word** to search for Microsoft Word, and then click the **Word 2013** icon in the search results to start Word.
2. Click the **Internet Explorer** button on the taskbar to start Internet Explorer.
3. Right-click the **taskbar**, and then click **Show windows side by side**. See **Figure 2–8**.

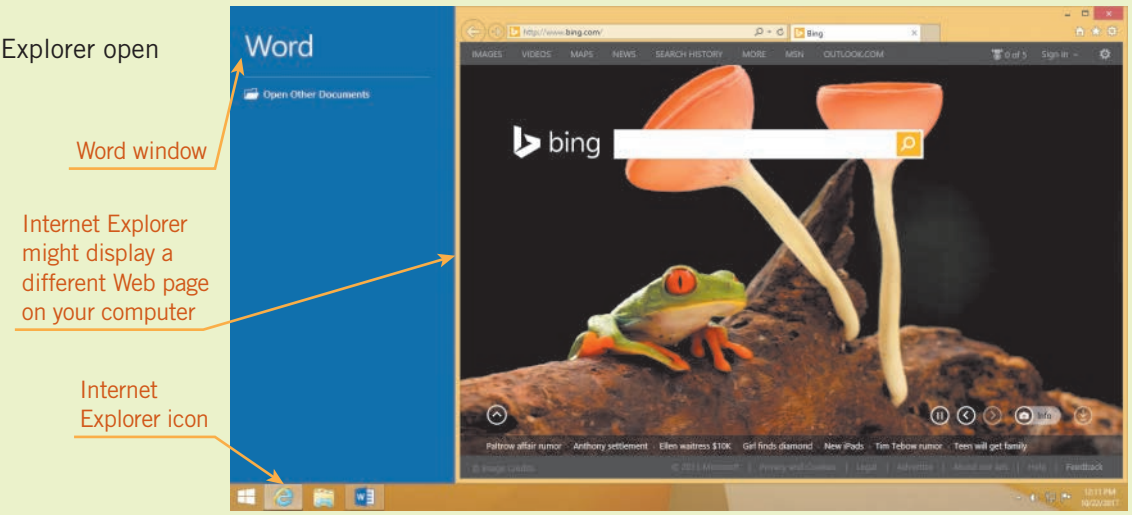


FIGURE 2–8
Word and Internet Explorer open on the desktop

4. Right-click the **taskbar**, and then click **Task Manager** on the shortcut menu to open the Task Manager window. The first time you start Task Manager, it lists only the applications running on your computer, as shown in **Figure 2–9**. Your Task Manager window might list different software or might be expanded to show more information.

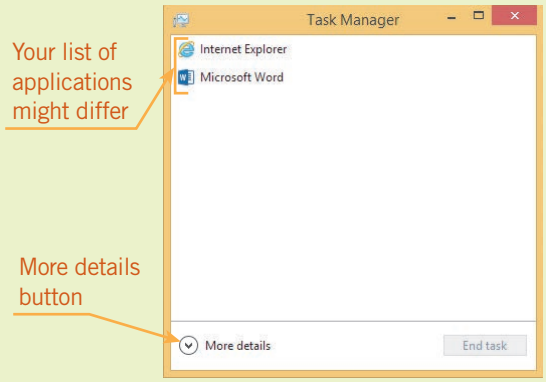


FIGURE 2–9
Task Manager in a condensed window

QUICK TIP

You can also start Task Manager from the Start screen as you do other applications. On the desktop, you can display the Charms bar, click the Search charm, search for Task Manager, and then click its icon in the search results.

5. If your Task Manager window is condensed as it is in Figure 2–9, click the **More details** button to expand the window and show more information. If necessary, click the **Processes** tab to display the processes Windows is managing. See **Figure 2–10**. Task Manager might show different information on your computer.

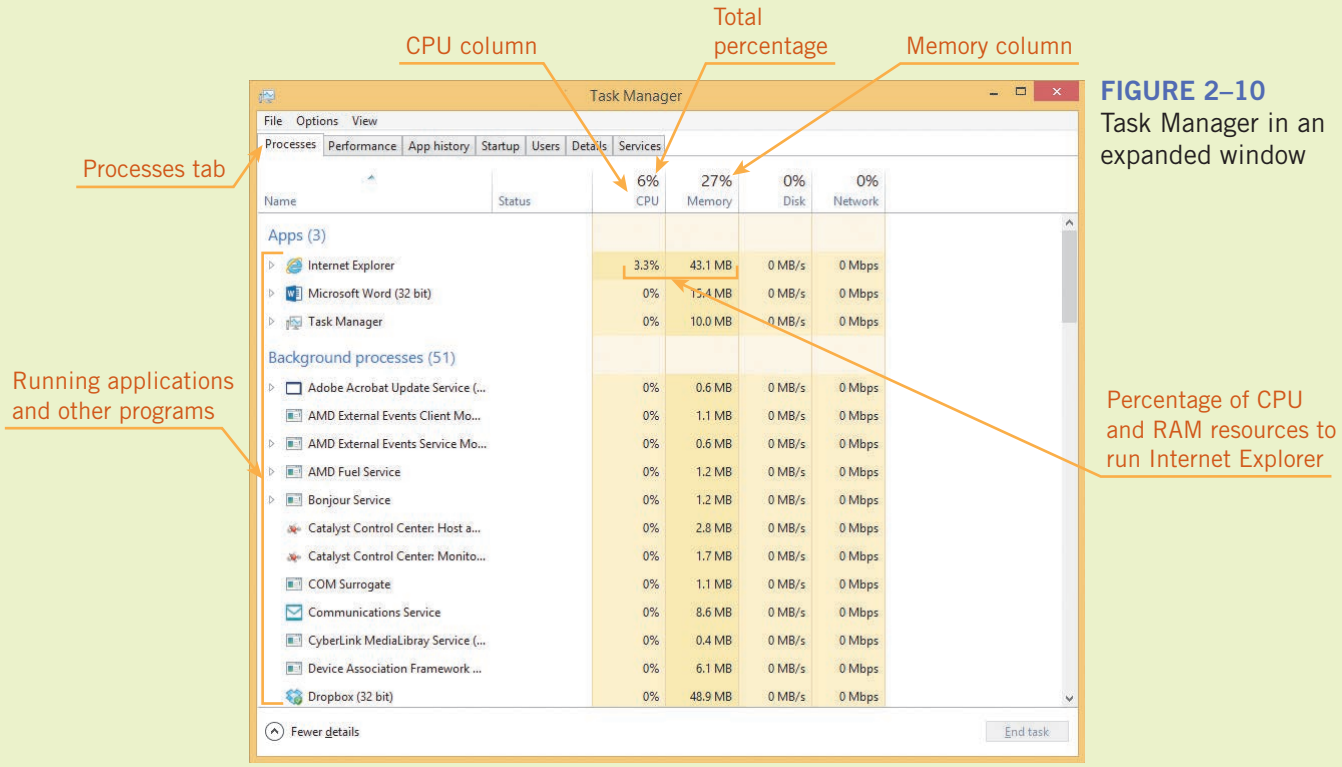


FIGURE 2–10
Task Manager in an expanded window

On the left, the Processes tab lists running applications in the Apps section and other programs in the Background processes section. The Apps section lists the two applications you started—Internet Explorer and Microsoft Word—and Task Manager itself. The Background processes section lists programs the operating system started and is running in the background; you do not need to interact with the background processes.

The columns on the right show usage information for the CPU, memory, disk, and network. The CPU column shows the percentage of processing resources each application and background process requires from the CPU to run, with the total percentage at the top of the column. For example, on the computer shown in Figure 2–10, the CPU is expending 3.3 percent of its resources to run Internet Explorer. All of the running processes combined require only 6 percent of the CPU's resources, which means the CPU can handle many more tasks efficiently.

The Memory column shows the amount of RAM each item is using as it runs, with the total percentage at the top of the column. For example, on the computer shown in Figure 2–10, Internet Explorer requires the most RAM to run. However, applications and background processes are using only 27 percent of RAM, which means plenty of RAM is available for other tasks.

6. Click the **Performance** tab to display performance information as line charts. If necessary, click **CPU** in the left pane to graph how the running processes on the computer are using CPU resources. See **Figure 2–11**. Every few seconds, the chart changes as a new process begins to use CPU resources.

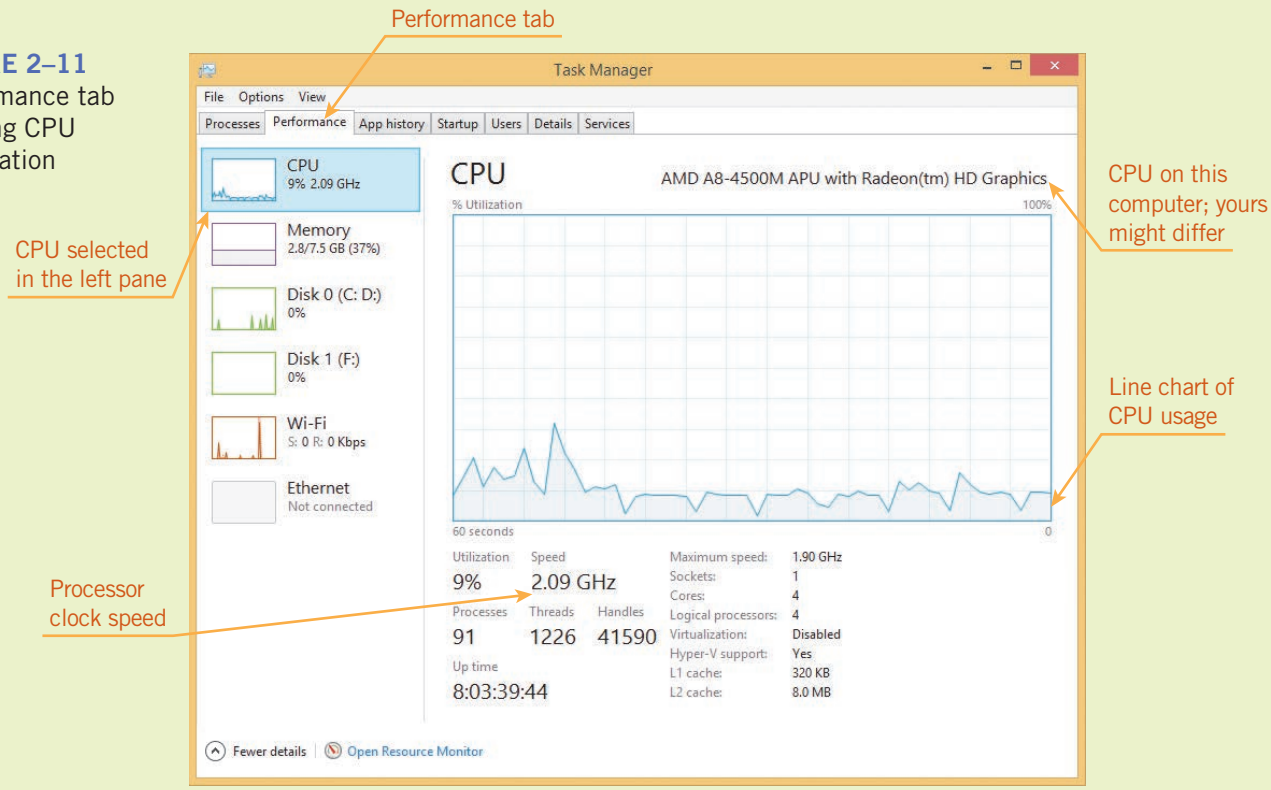


FIGURE 2–11
Performance tab showing CPU information

7. Click **Memory** in the left pane to graph how the running processes on the computer are using RAM. See **Figure 2–12**. Unless your computer is performing many background tasks, the graph of memory usage should be fairly constant.

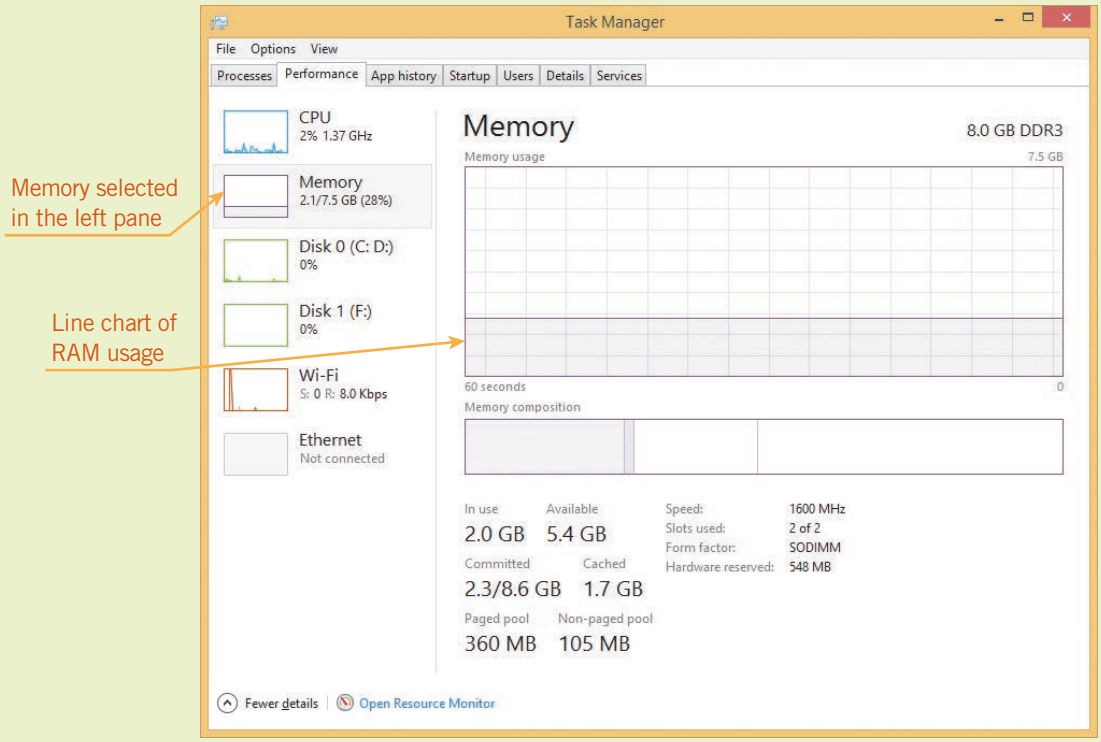


FIGURE 2–12
Performance tab showing memory information

8. Click the **Close** button in the upper-right corner of the window to close Task Manager.
9. Close Internet Explorer, but leave Word running for the next Step-by-Step.

Understanding System Requirements

1-1.1.3

When you purchase a computer, it comes with system software and application software. You add other applications to perform tasks and get the most out of the computer. If you can identify the characteristics and functions of the hardware components in your computer, you can select the right software for your system. To do that, you need to compare an application's system requirements to the computer system you are using. ***System requirements*** are hardware characteristics such as the amount of memory and speed of the processor. An application lists these hardware specifications on the product's box or Web site. Consider the specifications as minimum requirements. In other words, your computer should have the same or better characteristics as those listed in the system requirements. **Figure 2–13** shows the system requirements for Microsoft Office, a group of applications that works similarly and provides a variety of capabilities that allows you to create and work with documents, spreadsheets, databases, and presentations.

VOCABULARY
system requirements

Office Home & Student 2013

COMPONENT	REQUIREMENT
Computer and processor	1 gigahertz (GHz) or faster x86-bit or x64-bit processor with SSE2
Memory	1 GB RAM (32-bit); 2 GB RAM (64-bit)
Hard disk	3.0 GB available disk space
Display	1366 x 768 screen resolution
Graphics	Graphics hardware acceleration requires a DirectX 10 graphics card.
Operating system	Windows 7, Windows 8, Windows Server 2008 R2, or Windows Server 2012
Browser	Supported browsers for Office 2013 and Office 365 (includes browser requirements for using Apps for Office and Word video playback)
Other	Internet functionality requires an Internet connection. Fees may apply.
	Multi-touch features require a touch-enabled device. All features and functionality are always available by using a keyboard, mouse, or other standard or accessible input device. New touch features are optimized for use with Windows 8.
	Certain online functionality requires a Microsoft account.
	Certain features require a Skype account.
	Product functionality and graphics may vary based on your system configuration. Some features may require additional or advanced hardware or server connectivity; www.office.com/products.

Processor speed and bit size

Amount of RAM

FIGURE 2–13 System requirements for Microsoft Office

ABOVE AND BEYOND

If you want to use the same applications or external devices on different computers, you need to make sure the computers are compatible, which means that they operate in the same way and run the same software. If computers have the same platform, they are compatible.

If your computer does not meet the application's system requirements, the application will not be able to run or will run ineffectively. For example, one system requirement is the version of the operating system. If the application requires Windows 7 or 8, you might not be able to run it on a computer with an earlier version of Windows, such as Windows XP. Another requirement is RAM. If your computer has less than the specified amount of RAM, you most likely cannot run the application at all.

Optional Hardware Requirements

1-1.1.3

Some applications include features designed for particular hardware. For example, word-processing software might include a feature that accepts voice input from a microphone so you can speak commands instead of clicking buttons or narrate text instead of typing it. Many popular applications now include features that accept input from touchscreens so you can use a fingertip to select commands or handwrite text input. These are optional hardware requirements. You can use the software without the hardware, but having the hardware extends the features of the software.

In Step-by-Step 2.1, you started Microsoft Word, which provides most of its buttons on the Ribbon, a banner that stretches across the top of the Word window. (You thoroughly explore the Ribbon in Module 2.) You can display the Ribbon in one of two modes. The default ***Mouse Mode*** places the buttons close together on the Ribbon because you can move the pointer to a precise location and click a button when you use a mouse. The other mode is ***Touch Mode***, which adapts the Ribbon for users of touchscreens. In Touch Mode, Word expands the space between buttons so you can use a fingertip to tap one button without touching another. To switch from one mode to another, you use the Quick Access Toolbar, a bar of buttons providing easy access to commands you use frequently.

VOCABULARY

Mouse Mode

Touch Mode

In Step-by-Step 2.2, you turn Touch Mode on and off to see how application software can change depending on hardware settings.

Step-by-Step 2.2

1. Maximize the Word window, if necessary, and then click **Blank document** in the right pane to open a new blank document. Take a moment to review the buttons on the Ribbon, which appears in Mouse Mode by default. You use the Quick Access Toolbar to turn on Touch Mode. See **Figure 2–14**.

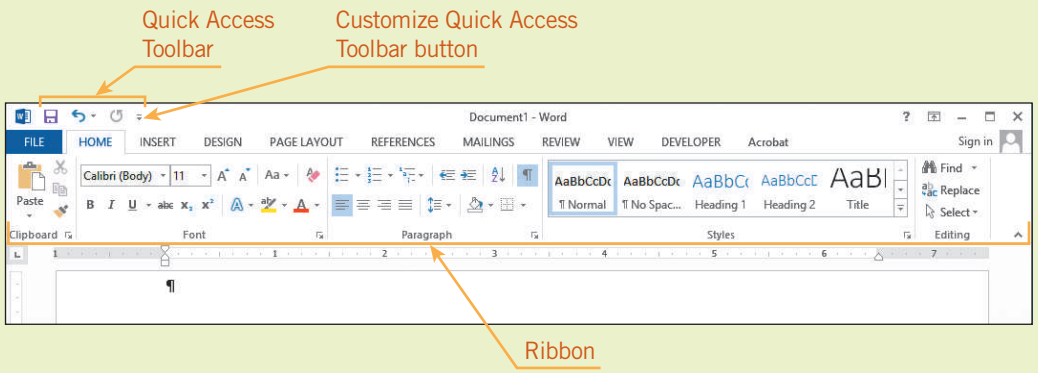
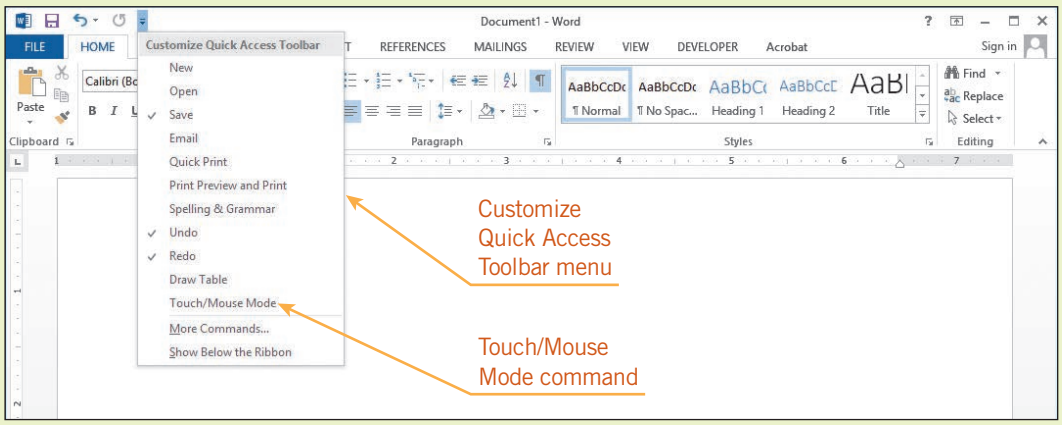


FIGURE 2–14
Quick Access Toolbar in Word

2. On the Quick Access Toolbar, click the **Customize Quick Access Toolbar** button to display the menu. See **Figure 2–15**.

FIGURE 2–15
Customize Quick Access Toolbar menu

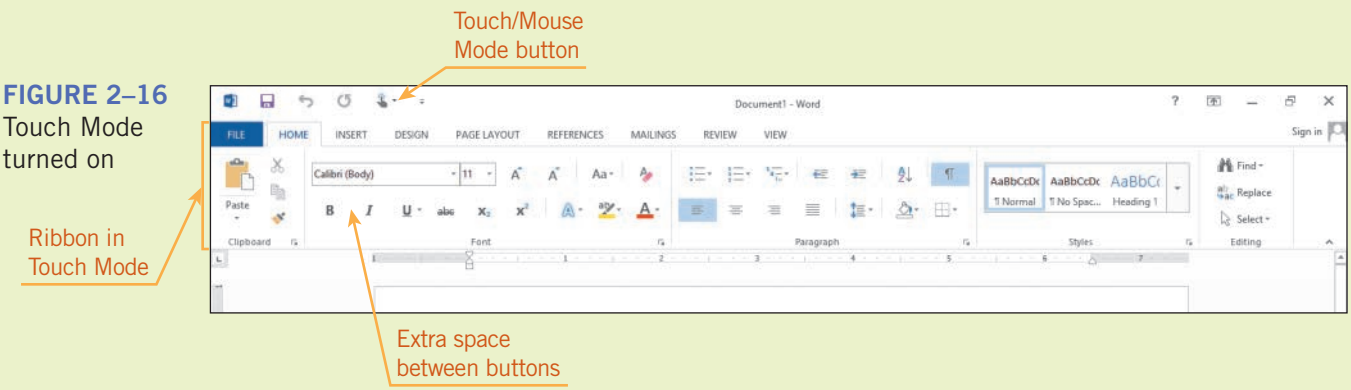


QUICK TIP

If the Touch/Mouse Mode command appears with a check mark, the Touch/Mouse Mode is button already appears on the Quick Access Toolbar. Skip Step 3.

3. If the Touch/Mouse Mode command appears without a check mark (as it does in Figure 2–15), click **Touch/Mouse Mode** to display the Touch/Mouse Mode button on the Quick Access Toolbar.
4. On the Quick Access Toolbar, click the **Touch/Mouse Mode** button and then click **Touch** to turn on Touch Mode. The Ribbon is now slightly taller and includes more space between each button. See **Figure 2–16**. If you are using a computer with a touchscreen, you can now use your fingertip to tap buttons on the Ribbon to select them.

FIGURE 2–16
Touch Mode turned on



5. To switch back to Mouse Mode, click the **Touch/Mouse Mode** button on the Quick Access Toolbar, and then click **Mouse** to return the Ribbon to its default setting.
6. To remove the Touch/Mouse Mode button from the Quick Access Toolbar, click the **Customize Quick Access Toolbar** button, and then click **Touch/Mouse Mode**.
7. Click the **Close** button in the upper-right corner of the window to close Word.

Updating Software

1-1.1.4

The software development organizations that create and distribute system and application software are constantly changing their software to keep up with hardware developments and user requests. For example, if the manufacturer of a digital media device such as an iPod upgrades the device or releases a new model, the operating system needs a new copy of the driver so it can properly control the device. In addition, software users might report problems, or bugs, when using the software with a certain type of hardware or under certain conditions. Users or developers might also discover problems with security that could allow unauthorized users to access your computer and its data. In these cases, the software is revised to address the problems. If you purchased the original version of the software, or if it came preinstalled on your computer, you can download a ***patch***, ***update***, or ***service pack*** from the Internet to include the latest revisions in your copy of the software. **Table 2–1** describes each of these, which are collectively called software updates.

VOCABULARY

patch

update

service pack

upgrade

install

automatic update

TABLE 2–1 Types of software updates

TYPE	DESCRIPTION
Patch	Small program that corrects or enhances existing software
Update	Collection of files (larger than a patch) that revises software to fix problems or provide enhancements
Service pack	Collection of updates, fixes, or enhancements to software delivered as a single file

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Software developers use version numbers to keep track of the software they release. The original software is assigned version 1.0. In general, the first version of the software revised to include a patch or update is version 1.1, the next is version 1.2, and so on. When developers make major improvements, add new features, or change the software design, the new version is called an ***upgrade***. The first upgrade is assigned version number 2.0, the next is version 3.0, and so on, with each subsequent upgrade numbered in sequence. Although developers provide software updates free of charge, you need to purchase a software upgrade. If you own a version of the software, you can usually purchase the upgrade for less than the price charged to new users.

You can download most software—whether the original version, an update, or an upgrade—from the software developer's Web site. Instructions for installing the software are provided on the Web site or included with the files you download. ***Installing*** means to move a copy of the software from its distribution location (such as a Web site) to your computer. As you install software, it sends requests to the operating system to change system settings as necessary to make sure the new software runs with the current hardware and software on your computer.

System and application software often include tools for managing updates. Most provide an ***automatic update*** feature, which automatically checks for software updates and then downloads them when they are available. For operating system updates, Microsoft, Apple, and other developers recommend that you use the automatic update feature to ensure that your computer has the software it needs to run smoothly and reliably.

ABOVE AND BEYOND

A Web application, also called a *Web app*, is an application stored on a server connected to the Internet that you access using a browser. Web apps designed for business are also called Software as a Service (SaaS). Because you work with Web apps directly on a Web site, you do not need to update them; the software developers keep them up to date. In addition, you do not need to check the platform or system requirements or install the software. If your browser can access the Web site, and you pay a subscription fee or sign in, you can use the application. You can find Web apps for word processing, creating and editing graphics, sharing photos and videos, and much more.

Most automatic updates take place in the background, so you can continue working on the computer without interruption as the update is downloaded and installed. However, many updates, especially those to the operating system, require you to restart the computer after installing the update. To avoid restarting, you can turn off the automatic installation feature for noncritical updates and install them yourself. (You'll learn how to turn off this feature in Windows in Step-by-Step 2.3.) Windows and other operating systems remind you to install the updates you've downloaded. For software other than operating systems, you can turn off automatic updating altogether and use the manual update feature instead. When performing a ***manual update***, you download and install the updates yourself. In some cases, you must visit the software developer's Web site, and then search for the update. More common is to set the update feature to notify you when updates are available so you don't miss any important updates. **Figure 2–17** shows part of an iPhone screen with applications ready to be updated. The red circle on the App Store icon represents eight software updates that are ready to be downloaded.

VOCABULARY
manual update

ABOVE AND BEYOND

Operating system updates often include updates to device drivers. However, if you are having trouble with a piece of hardware, you can update the driver on your own. To do so, visit the device manufacturer's Web site. Typically, you can enter the model number of the device in a Search box to display technical support information about the device, including information about updates. Look for an update created for your operating system, and then click a button to download the software and installation instructions to your computer. Follow the instructions to install the driver on your system.



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FIGURE 2–17 iPhone software ready to be updated

Updating Operating Systems

IC3 1-1.1.4

Personal and mobile operating systems provide tools to keep the operating system up to date by contacting a server and then downloading the files containing the updates. The tools let you select settings for how and when to update the operating system. After configuring the update tool, you update the operating system in one of the following ways depending on the settings you selected:

- If you choose to download and install updates automatically, your updating tasks are complete—the operating system takes care of updates as they become available.
- If you choose to download the updates automatically, but install them yourself, the operating system notifies you that it downloaded updates and reminds you to install them.

- If you choose to check for updates automatically and then download and install them on your own, the operating system notifies you that the updates are available and reminds you to download and install them.
- If you choose not to check for updates automatically, you can use the updating tool to contact the appropriate server to check for and download updates manually.

As it installs an update, a personal operating system provides tools to reverse the update in case it causes unforeseen problems. In Windows, this tool is called a system restore point; in Mac OS X, it is called the Time Machine.

In Windows, you use ***Windows Update*** to check for the latest updates to Windows and to review your update settings. Windows Update can download three types of updates, which are described in **Table 2–2**.

VOCABULARY
Windows Update
Control Panel

TABLE 2–2 Windows updates

TYPE	DESCRIPTION
Important	Updates you should install to maintain the security and reliability of Windows
Recommended	Updates that enhance your computing experience or repair problems that are not considered critical
Optional	Updates that are not critical and do not apply to all Windows users

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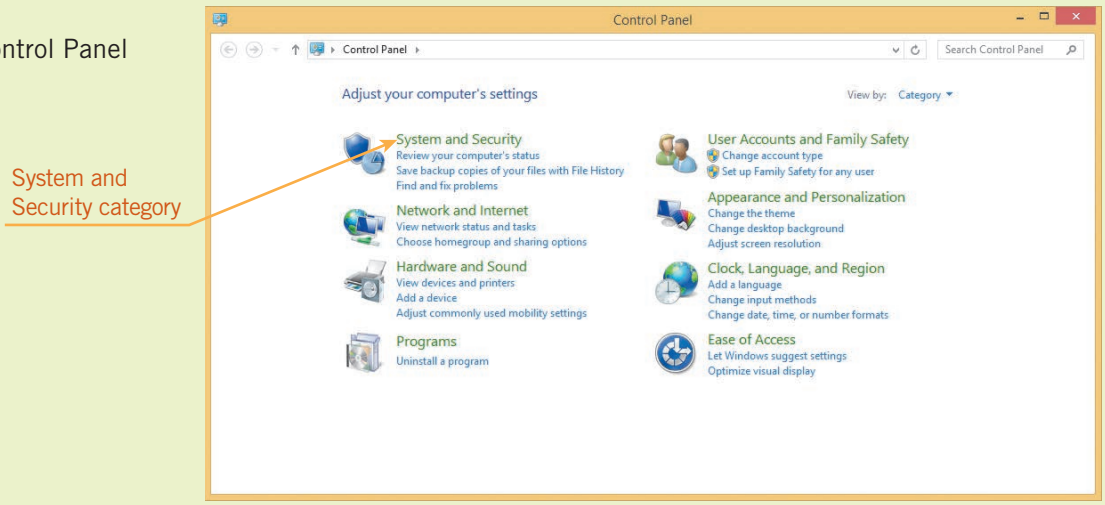
You can set Windows to download and install important and recommended updates automatically. (You can only download and install optional updates manually.) You can also indicate when Windows should install the updates. To let you know that updates are available or that Windows is ready to download or install updates, a message appears on the Welcome screen indicating that updates are available or will be installed within a set timeframe. If you've set up automatic updating, Windows will download and install the update as you work on your computer. If restarting your computer is necessary to complete the update, Windows waits until you're finished with your work before restarting your computer. If your computer task takes up the entire screen, such as when you're watching a movie, Windows waits until you are finished with that task.

In Step-by-Step 2.3, you open Windows Update and review its options without changing any settings. Windows Update is a tool provided in the ***Control Panel***, a window containing specialized tools you use to change the way Windows looks and behaves. If you are working in a computer lab and are not allowed to use the Control Panel, read but do not perform the following steps.

Step-by-Step 2.3

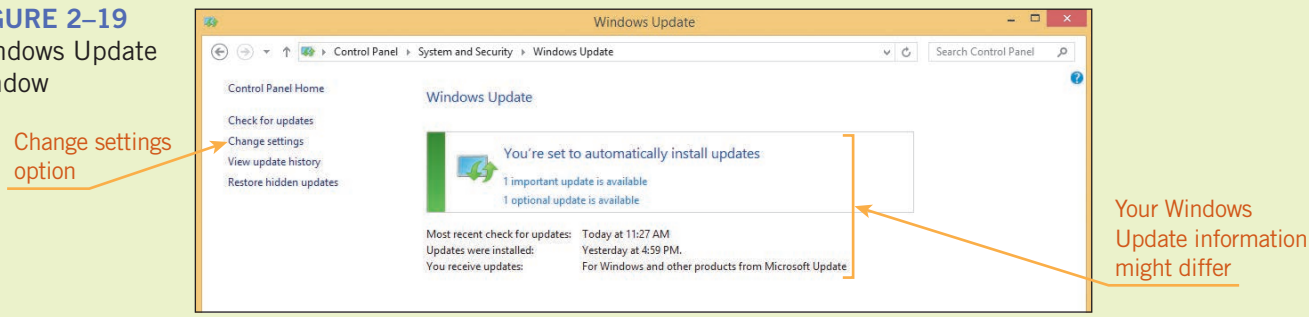
1. On the desktop, point to the lower-right corner of the screen to display the Charms bar, and then click the **Settings** charm to display the Settings menu.
2. Click **Control Panel** to open the Control Panel window. See **Figure 2–18**. The main window of the Control Panel is called the Home page. By default, this page displays categories of Control Panel tools. Windows Update is in the System and Security category.

FIGURE 2–18
Home page in the Control Panel window



3. Click **System and Security** to display the System and Security window.
4. Click **Windows Update** to display the Windows Update window. See **Figure 2–19**. Your update settings might differ.

FIGURE 2–19
Windows Update window



QUICK TIP

To quickly check for Windows updates, display the Charms bar, click the Settings charm, click Change PC settings, click Windows Update in the left pane, and then click the Check for updates now button.

5. In the left pane, click **Change settings** to open the Change settings window. See **Figure 2–20**. You use this window to set how you want to receive important and recommended updates and whether you want to receive updates for other Microsoft products, such as Microsoft Office applications.

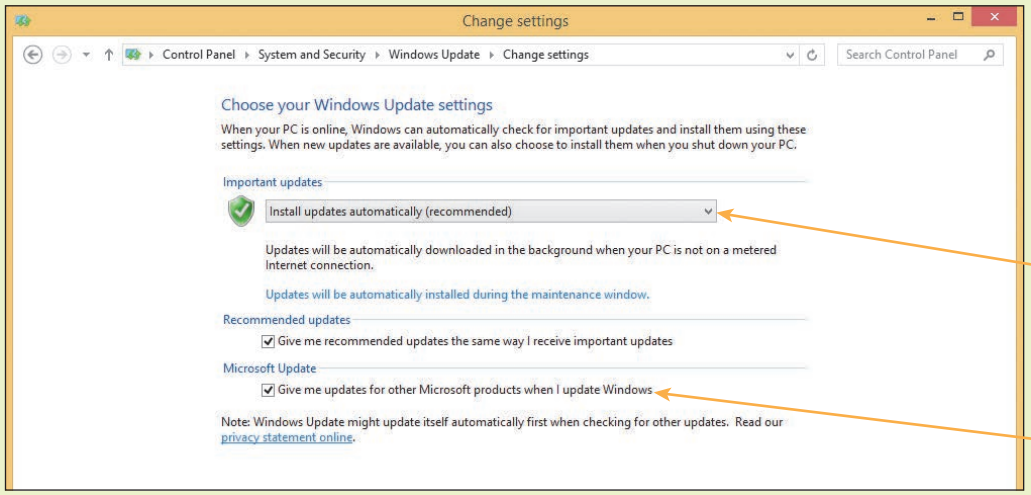


FIGURE 2–20
Change settings window

6. Click the first button in the Important updates section, which is labeled "Install updates automatically (recommended)" as shown in **Figure 2–20**. A list of update options appears. See **Figure 2–21**. These options are similar to the ones described before you started this Step-by-Step. To use automatic updates, you would select the Install updates automatically (recommended) option, if necessary. To use manual updates, you would select the Never check for updates (not recommended) option, though this option is not suitable for operating system updates.

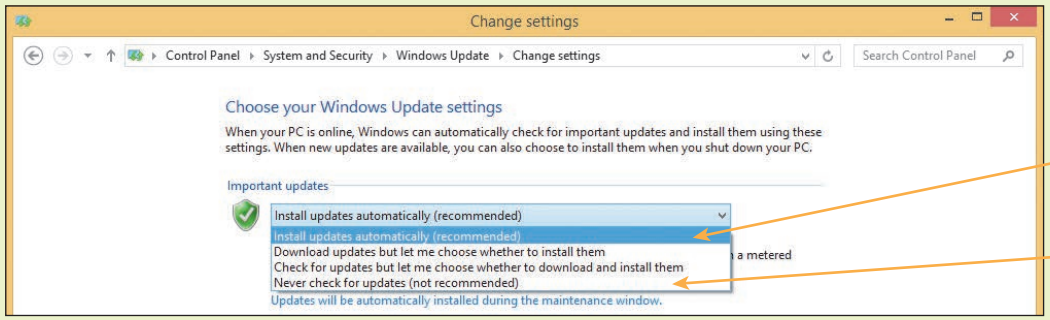


FIGURE 2–21
Update options

7. Click a blank area of the window to close the list of options, and then click the **OK** button to return to the Windows Update window.
8. In the left pane of the Windows Update window, click **Check for updates** to check for any important, recommended, or optional updates. For the computer shown in **Figure 2–22**, Windows found 16 important updates and 2 optional updates. Your results might differ.

QUICK TIP

If a message appears indicating that you need to restart your PC to finish installing previous updates, continue with the steps.

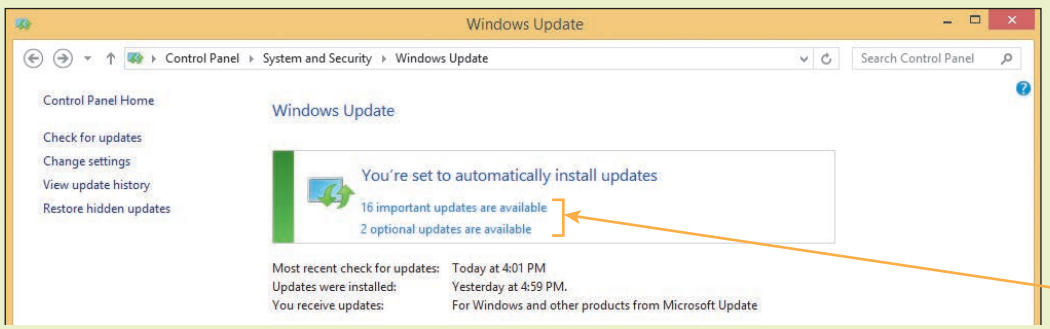


FIGURE 2–22
Results of checking for updates

9. If one or more updates are available, click the notification. For example, click **2 optional updates are available** or a similar notification. The Select updates to install window lists the available updates. See **Figure 2–23**.

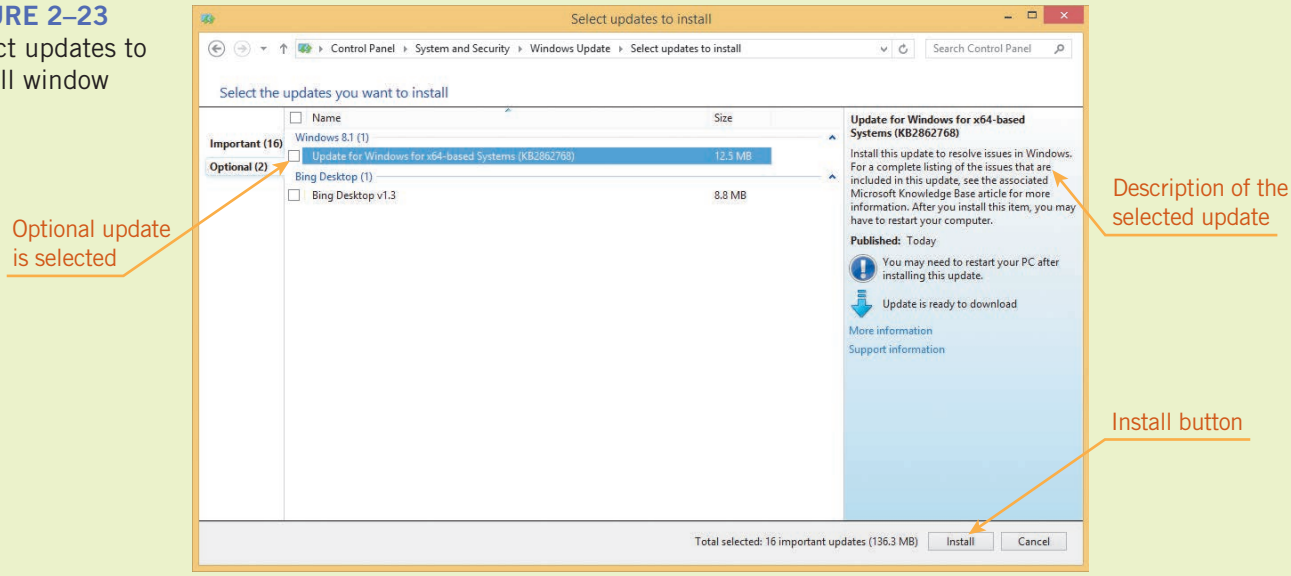


FIGURE 2–23
Select updates to install window

Read the description of the update to determine whether you want to download and install it. If you wanted to download and install the update, you could click the check box next to the update's name, and then click the Install button.

10. Click the **Close** button in the upper-right corner of the window to close the window.

ETHICS IN TECHNOLOGY

Malware

One of the most important reasons to keep an operating system up to date is to protect it from malicious software, or malware. Especially when you connect to the Internet, your computer is vulnerable to harm from people who might try to steal your personal information, damage your data, or interrupt your work. Malware includes viruses, programs that copy themselves onto your computer, typically from a Web site, and then run to infect your computer. The damage a virus can cause ranges from changing your settings to corrupting your operating system. In addition to keeping your operating system up to date, you should install an antivirus application, software designed to block and remove viruses from your computer before it can become infected, and keep it up to date.

People who create and send malware are called hackers, and includes anyone who intends to access a computer system without permission. Hackers with illegal intent are called crackers or black-hat hackers. Others are actually hired by organizations who want to protect their systems from malware and data theft. These types of hackers are called white-hat or ethical hackers, and their aim is to find and fix security vulnerabilities before black-hat hackers can exploit them.

SUMMARY



In this lesson, you learned:

- The characteristics and capabilities of a computer's internal hardware components directly influence computer performance.
- The system unit is the case that contains a computer's main system components, including the motherboard, the processor, and memory. All of the essential chips and the circuitry that connects them are on the motherboard.
- The internal hardware that processes data is the processor, also called the microprocessor and the central processing unit (CPU), a single computer chip that contains all the electronic circuitry for performing a personal computer's processing tasks. The processor has a significant effect on a computer's performance and computing power.
- The CPU has two primary sections: the arithmetic/logic unit (ALU) and the control unit. The ALU performs arithmetic calculations and logical operations. The control unit coordinates all of the processor's activities and manages the flow of information through the processor.
- The CPU carries out each instruction it receives from software by repeating four basic operations, which comprise the machine cycle: fetching, decoding, executing, and storing. The fetching and decoding operations make up the instruction cycle. The executing and storing operations make up the execution cycle.
- The clock speed indicates the number of instructions the CPU can process per second. The clock speed directly influences the speed of the machine cycle, and therefore, the overall performance of the computer.
- The type of processor in a computer affects how quickly the computer can accept and carry out instructions from software. A multicore processor is a single chip that contains more than one processor, such as dual-core processors and quad-core processors.
- If a computer has a multicore processor, the operating system can use multiprocessing to split tasks among the processors. With multiprocessing, each processor can work on a different task at the same time.
- On a computer with a single-core processor, the operating system can use multitasking and multithreading. A multitasking operating system can run more than one program at the same time. A multithreading operating system handles many parts, or threads, of a single program.
- To store data and instructions, the CPU, operating system, and applications use memory, which consists of chips inside the system unit. A computer has two major types of memory: volatile memory such as RAM and nonvolatile memory such as ROM. Volatile memory loses its contents when you turn off the power to the computer, while nonvolatile memory is permanent and does not lose its contents when you turn off the power to the computer.
- The amount of RAM in your computer has a significant effect on performance. If you do not have enough RAM, the operating system must move data in and out of RAM frequently, which slows performance. If the operating system spends more time swapping data between RAM and virtual memory than running software, it is said to be thrashing, which makes the computer sluggish or completely unresponsive.
- ROM is stored on single chips attached to the motherboard. The operating system retrieves the data or programs stored in ROM when it needs them, such as when the computer starts up. ROM is read-only memory because the operating system does not regularly write over its contents.
- EEPROM and flash memory are types of ROM that are nonvolatile, but can be modified.
- If you change system components on your computer, by adding RAM, for example, the BIOS stored on a ROM chip must be updated to take these configuration changes into account.
- In addition to RAM, the CPU accesses memory caches to speed processing. The small amount of memory stored on the CPU itself, apart from the registers, is called level 1 cache memory. Level 2 cache memory is a larger amount of memory that can reside on the CPU or on a chip that has a direct connection to the CPU.
- You can tell how efficiently a computer is working by tracking its CPU and RAM usage. The lower the usage, the more efficiently the operating system is performing tasks. In Windows, you use Task Manager to track CPU and RAM usage.
- Applications have system requirements, which are hardware specifications such as the amount of memory and speed of the processor. If your computer does not meet the application's system requirements, the application will not be able to run or will run ineffectively.
- Some applications include features designed for special hardware such as touchscreens, which allow you to use a fingertip to select commands or handwrite text input. Microsoft Word includes a button that lets you switch to Touch Mode, which adapts the Ribbon for users of touchscreens.
- Software developers are constantly updating system and application software to keep up with hardware innovations and changes, user requests, and security threats. They release updated software as a patch, update, or service pack.
- When developers make major improvements to software, add new features, or change the design, the new version is called an upgrade. The first upgrade is assigned version number 2.0, the next is version 3.0, and so on.

- You can download software, including new versions and updates, and installation instructions from a Web site. When you install software, you move a copy from its distribution location to your computer. During installation, the operating system changes its settings to make sure the software runs with your hardware.
- To update system and application software, you can use the software's automatic update feature, which automatically checks for software updates and then downloads them when they are available, or you can perform a manual update, where you download and install the updates yourself.
- You use Windows Update to check for the latest updates to Windows and to review your update settings. Windows Update can download important, recommended, and optional updates. Windows Update is a tool provided in the Control Panel, a window containing specialized tools you use to change the way Windows looks and behaves.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The CPU has two primary sections: the arithmetic/logic unit and the control unit.

T F 2. Flash memory is the most common type of volatile memory, which loses its contents when you turn off the power to the computer.

T F 3. A memory chip is the most important hardware component in a computer.

T F 4. You can tell how efficiently a computer is working by tracking its CPU and RAM usage.

T F 5. One reason to update your operating system is to keep up with changes in hardware.

MULTIPLE CHOICE

Select the best response for the following statements.

1. Applications have specific _____, which are hardware characteristics such as the amount of memory and speed of the processor.
   A. device drivers
   B. multitasking requirements
   C. system requirements
   D. version numbers
2. A(n) _____ is a small program that corrects or enhances existing software.
   A. patch
   B. update
   C. service pack
   D. Web app
3. The _____ is a single computer chip that contains all the electronic circuitry for performing a personal computer's processing tasks.
   A. RAM
   B. OSU
   C. CPU
   D. PCU
4. The type of _____ in a computer affects how quickly the computer can accept and carry out instructions from software.
   A. motherboard
   B. device drivers
   C. buffer
   D. processor
5. When developers make major improvements to software, add new features, or change the design, the new version is called a(n) _____.
   A. service pack
   B. upgrade
   C. platform
   D. optional update

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What does the CPU do in a computer?

2. If a computer has a multicore processor, what can the operating system do to improve performance? How does this technique work?

3. If a computer has a single processor, what two techniques can the operating system use to improve performance? How do these techniques work?

4. Describe thrashing and how it affects a computer.

5. What are the operations in the machine cycle? What happens during each operation as the CPU processes instructions and data?

6. What is an example of an application feature designed for particular hardware?

7. What is an automatic update and when should you use it?

8. How can you download and install optional Windows updates?

9. What could you do on a Windows computer to determine whether an application was affecting system performance?

10. Give two reasons you should be aware of your computer's system components and their characteristics.

PROJECTS

PROJECT 2–1

1-1.1.3

In this project, you start two applications, open the Task Manager, and then answer questions about what you find. Submit the written answers as your instructor requests.

1. Start any two applications on your computer, such as Weather and Microsoft Word.
2. Start Task Manager and expand the window, if necessary.
3. On the Processes tab, examine the information in the Memory column. How much total memory are the apps and other processes using?
4. Which process is using the most memory?
5. Scroll down to review the processes listed in the Background processes and Windows processes sections. Name a process in each section that is using the most CPU resources.
6. Name a process in each section that is using the most memory.
7. Click the **Performance** tab. Display and review a chart of CPU performance for about a minute. Next, display and review a chart of memory performance. Describe the differences.

PROJECT 2–2

1-1.1.4

In this project, you learn how to set a schedule and explore other features in Windows Update, and then answer questions about your activities. Submit the written answers as your instructor requests. Some steps require you to perform new tasks or solve problems independently.

1. Open the Control Panel. On the Home page, click **System and Security**. In the System and Security window, click **Windows Update**.
2. In the left pane, click **Change settings**. Note the current settings in this window in case you need to restore them at the end of the project.
3. Click the button in the Important updates section, and then click **Install updates automatically (recommended)** if necessary to select this option.
4. Click **Updates will be automatically installed during the maintenance window.** to open the Automatic Maintenance window. How can you use the Automatic Maintenance window to set a schedule for automatic updates?
5. Click the **Cancel** button to return to the Change settings window. How can you also automatically download and install recommended updates?
6. Click the **Cancel** button to return to the Windows Update window, and then click **View update history** in the left pane. Has your computer installed any optional updates? If so, how many? Has your computer installed any recommended updates? If so, give an example.
7. When did your computer install the most recent important update?
8. Click the **OK** button to return to the Windows Update window. What types of updates is your computer set to receive?
9. If you changed any settings in this project, return them to their original selections.
10. Close the Windows Update window.

PROJECT 2–3

1-1.1.3

In this project, you use Windows Help and Support to learn more about features for touchscreen users, and then answer questions about what you learned. Submit the written answers as your instructor requests.

1. Display the Charms bar, and then click the **Settings** charm.
2. On the Settings menu, click **Help** to open the Windows Help and Support window.
3. Click **Get started** on the Help home page.
4. Click the **Touch: swipe, tap, and beyond** topic. Describe the information covered in this topic.
5. What are the hardware requirements for using the techniques described in this topic?
6. At the bottom of the window, click the **Mouse and keyboard: What's new in Windows** topic. Describe how to display the Charms bar (all charms) using the keyboard.
7. Close the Windows Help and Support window.

TEAMWORK PROJECT

1-1.1.3

You are starting a new job for an insurance company that allows you to work from home, provided your computer is powerful enough to handle the workload. Your new manager advises you to be prepared to add RAM to your computer. You have $50 to spend on RAM. Work as a team of two to complete the following steps:

1. Assign one of the following tasks to each team member: selecting the amount of RAM and installing the RAM.
2. Use the Internet and other resources to research your task, focusing on how much RAM you need and can purchase with your budget and how to physically install the RAM.
3. Collaborate as a team to create a document summarizing your findings. Submit the document as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 2–1

1-1.1.3
1-2.1.1
1-2.1.2

Compare the system requirements for software to the hardware specifications listed on a Web site that offers computers for sale.

1. Suppose someone in your family offers to purchase software for you. Which software would you request? Visit the Web site of the appropriate software developer and find the system requirements for the software.
2. Visit a Web site that offers computers for sale, such as hp.com, dell.com, or store.apple.com. Find a laptop computer that meets the system requirements of the software you researched.
3. Create a table that lists the system requirements for the software in one column, and the corresponding hardware characteristics on the computer you found. Also provide the following information:
   - Name and version of the software you researched
   - Web site where you researched the software
   - Name and model of the computer you selected
   - Web site where you researched the computer
4. Submit the table as your instructor requests.

CRITICAL THINKING 2–2

1-1.1.4

In this lesson, you explored how to update Windows using Windows Update. Microsoft recommends that you use the automatic update feature to download and install operating system updates. Based on the information you learned in this lesson and information you can find in Help and Support, answer the following questions, and then submit the answers as your instructor requests.

1. Why does Microsoft recommend that you update Windows automatically?
2. If you don't use automatic updating, how often should you check for updates?
3. When does Microsoft typically release important updates?
4. Do you see any disadvantages to updating Windows automatically?

ONLINE DISCOVERY

ONLINE DISCOVERY 2–1

Intel and AMD manufacture the most popular processors for PCs, but what types of processors do Macintosh computers use? Research processors for the Mac on at least two Web sites and then answer the following questions. Submit the written answers as your instructor requests.

1. What processor did the first Macintosh computer use?
2. What type of processor does the current Mac Pro use? What is the maximum number of cores this processor can have?
3. Around 2005, Macintosh computers began a transition from one type of processor to another. Name these two types of processors.
4. What type of processor does the most recent version of the iPad have? What company manufactures this processor?

ONLINE DISCOVERY 2–2

Because memory is so important to a computer's performance, researchers are constantly looking for new technologies and techniques for increasing memory inexpensively and without consuming extra power. Research the future of computer memory on at least two Web sites to answer the following questions. Submit the written answers as your instructor requests.

1. What is the Hybrid Memory Cube?
2. What type of material could engineers use to produce a new type of flash memory?
3. What advantages could this type of flash memory offer?
4. What do nanomagnetic computers use to store and process data?
5. What is o-RAM? What benefits does it have compared to current RAM technology?

JOB SKILLS

No matter what field you choose for your career, it involves computers in some way. Work as a group or on your own to research how computers are used in a field that interests you. As part of your research, answer the following questions. Submit the written answers as your instructor requests.

1. What professional field interests you?
2. What type of computer hardware do people in this field use?
3. What types of applications do people in this field use?
4. What other types of technology do people in this field use?

EXPLORE AND SOLVE

Did you know?

- You can display a list of the hardware components installed in your computer.
- The Windows Experience Index is a rating that assesses these components on your computer.

1. Open the Control Panel, and then click **System and Security**.
2. Click **System**. Based on the information in the System section, answer the following questions:
   - What is your Windows Experience Index?
   - What type of processor do you have?
   - How much RAM is installed on your computer?
   - Can you use pen and touch input?
3. Submit the document as your instructor requests.



Estimated Time:
2 hours

LESSON 3

Windows File Management

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe how Windows stores files.
- Identify parts of the File Explorer window.
- Use File Explorer to navigate folders on your computer.
- Copy, move, delete, and rename files.
- Create and use shortcuts.
- Search for files.
- Identify file types.

DATA FILES

To complete this lesson, you will need these data files:

Basics.docx
Earth.png
Flower.png
Harmony.png
Notes.docx
Organize.pptx
Sample.pptx
Welcome.pptx

WORDS TO KNOW

application file
Clipboard
contextual tab
data file
disk
drive
executable file
file attribute
file path
file system
file type (file format)
folder
library
pin
Recycle Bin
removable media
root directory
shortcut
subfolder
system file
tag
USB drive

Microsoft product screenshots used with permission from Microsoft Corporation.

To work productively with a computer, you need to know how to organize and find files. Because Windows is the most popular operating system on personal computers, this lesson explains how to use Windows tools to manage files. You'll learn how to navigate the Windows file structure and change settings for viewing files. You'll also learn how to copy, move, delete, and rename files. To make sure you can find the files you need, you'll also create shortcuts and search for files. Finally, you'll identify file types so you are prepared for what happens when you open a file.

Understanding How Windows Stores Files

VOCABULARY

file

folder

drive

disk

removable media

USB drive

external hard disk

A ***file*** is a collection of data stored together. A report document, a photo of your pet, a recording of your favorite band singing "Happy Birthday," and a video demonstrating how to bake a cake from scratch—all of these are files. You store files in ***folders***, which are containers for related files, and on ***drives***, which are storage devices. You use folders to organize your files on a drive.

Drives contain certain types of ***disks***, which are storage media, including removable media and hard disks. ***Removable media*** are disks that you insert or attach to a computer, such as ***USB drives*** (also called flash drives and thumb drives) and digital video discs (DVDs). The term *hard disk* refers to a disk installed in the system unit that can store many gigabytes of data economically.

Before your computer can access a removable disk, you must insert the disk into a drive. A hard disk is housed in a drive inside the computer, so you don't need to insert a hard disk before a computer can access it. An ***external hard disk***, however, is contained in a removable drive that you can attach to your computer.

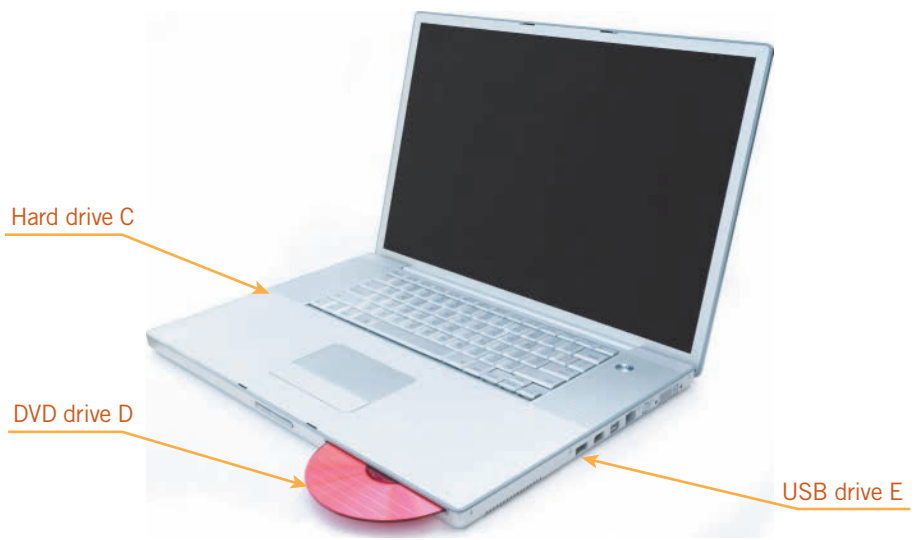
Windows names the drives on the computer by assigning each a drive letter. The hard drive containing the operating system is named drive C by default. The remaining drives can have any other letter from D to Z, but are usually assigned in the order that the drives were installed on the computer. For example, the DVD drive might be drive D and USB drives might be drive E, drive F, and drive G. See **Figure 3–1**.

QUICK TIP

You learn more about storage devices and media in Lesson 5.

ABOVE AND BEYOND

Why does Windows start assigning drive letters with drive C? Early PCs had a drive A and a drive B, both for floppy disks, which originally were 5.25-inch removable disks in a coated paper sleeve that were actually flexible, hence the name "floppy disks." They were replaced by 3.5-inch removable disks encased in hard plastic, but they still were called floppy disks. Although computers no longer have floppy disk drives, Windows continues to follow the convention of assigning the first hard disk to drive C.



© iStockphoto/Colonel

FIGURE 3–1 Drives on a computer

By convention, Windows includes a colon (:) after each drive letter. For example, your hard drive might be named Local Disk (C:).

Windows stores thousands of files in many folders on the hard disk of your computer. These are system files that Windows needs to display the Start screen and desktop, access drives, and perform other operating system tasks. To keep the system stable and to find files quickly, Windows organizes the folders and files in a structure, or hierarchy, called a ***file system***. At the top of the file system is the ***root directory***, which is where Windows stores folders and important files that it needs when you turn on the computer. These folders contain other folders, also called ***subfolders***, in which you can store your own files. See **Figure 3–2**.

VOCABULARY

file system

root directory

subfolder

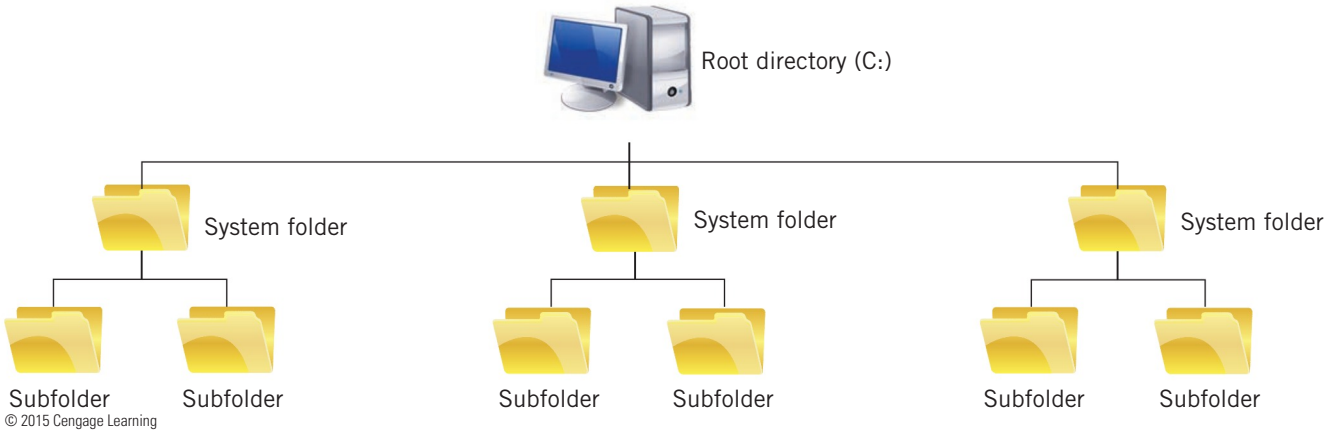


FIGURE 3–2 Basic file system

Although you can access almost any folder on your computer, including the root directory, you should store your documents, music, videos, and other files in subfolders, not in the root directory or other folder containing system files. In fact, most operating systems, including Windows, limit your access to critical files and folders in the root directory so you cannot inadvertently corrupt the file system.

1-1.2.1

Using File Explorer

VOCABULARY
File Explorer

Most operating systems include a file management tool that you use to organize your files. In Windows 8, this tool is ***File Explorer***. (In previous versions of Windows, this tool was called Windows Explorer.) As shown in **Figure 3–3**, File Explorer displays the contents of your computer, using icons to represent drives, folders, and files. You use File Explorer to display files and folders, navigate the Windows file system, and perform other file management tasks.

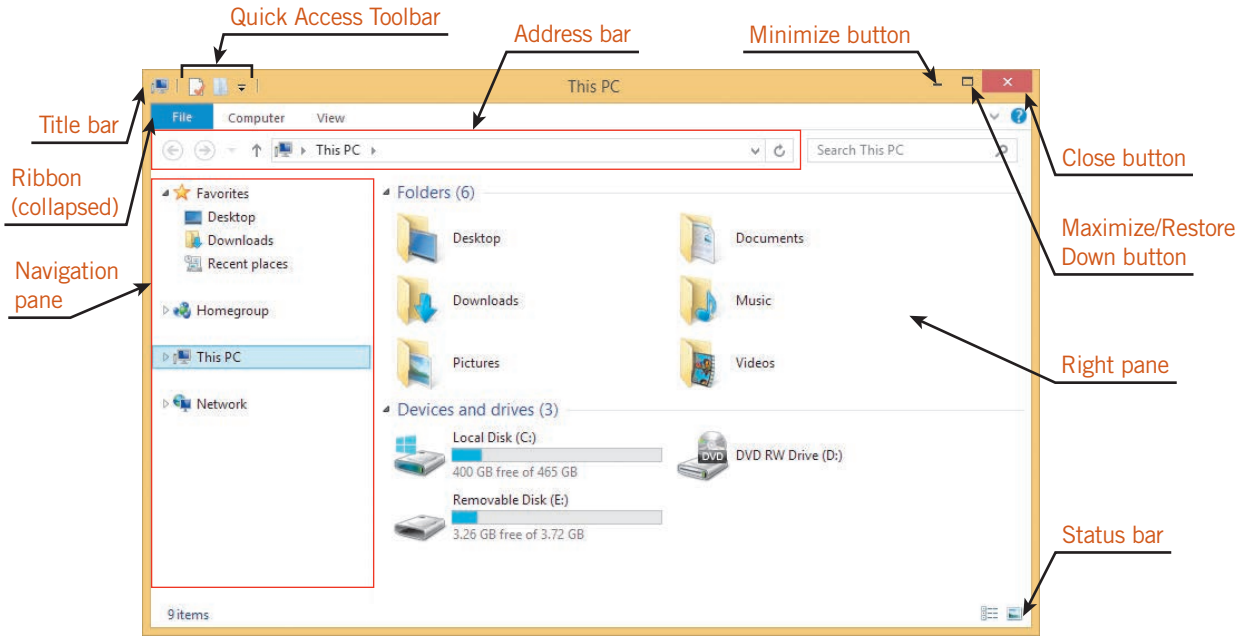


FIGURE 3–3 File Explorer

Table 3–1 describes the parts of the File Explorer window.

TABLE 3–1 Parts of the File Explorer window

PART	DESCRIPTION	USE TO
Title bar	Displays the name of the location shown in the right pane; also includes the Quick Access Toolbar and the Minimize, Maximize/Restore Down, and Close buttons	Identify the contents in the right pane and manipulate the window
Ribbon	Contains tabs with buttons and other tools for managing files; by default, the Ribbon is collapsed, though you can expand it	Organize, share, and view files and folders
Address bar	Includes tools for displaying folder contents and finding files	Navigate to previously opened folders and search for files
Navigation pane	Lists drive and folder icons and links to locations you use often	Navigate to any folder or other location your computer can access
Right pane	Displays the files and folders in the selected location	View and work with files and folders
Status bar	Provides information about the selected location and lets you display its contents in two views	Switch between two views of the selected location

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When you start File Explorer, it opens to show folders, devices, and drives on your computer as in Figure 3–3. Windows provides four of these folders for your personal files: the Documents, Music, Pictures, and Videos folders. The Desktop folder provides access to system resources such as the Recycle Bin, which you use later in this lesson when deleting files. The Downloads folder is for files you download, or copy, from the Internet and other networks. Devices and drives include the drives installed in your computer and any devices or drives attached to your computer.

ABOVE AND BEYOND

The file management tool in Mac OS X is named Finder. Each distribution of Linux comes with a file manager, such as Nautilus for Ubuntu and Dolphin for KDE. All are similar to File Explorer.

Folder Navigation

IC3 1-1.2.1

To work with files and folders, you must first display them in the File Explorer window. An easy way to do so is to use the Navigation pane. When you select an icon in the Navigation pane, its contents are displayed in the right pane. For example, when you select the This PC icon in the Navigation pane, the right pane displays the folders, devices, and drives on your computer. When you select a folder in the Navigation pane, the contents of that folder appear in the right pane.

The Navigation pane does not have enough space to show all the folders and subfolders on your computer at the same time. Instead, you open drives and folders only when you want to see what they contain. If a folder contains undisplayed subfolders, an expand icon appears to the left of the folder icon. The same is true for drives. To view the subfolders contained in a folder, you click the expand icon. A collapse icon then appears next to the folder icon; click the collapse icon to hide the folder's subfolders. To view the files contained in a folder, you click the folder icon, and the files appear in the right pane. You can also double-click any device, drive, or folder in the right pane to display its contents.

In addition to the Navigation pane, the Address bar in File Explorer provides the following shortcuts for navigating to locations on your computer:

- *Back button*—After you navigate to a folder, click the Back button to return to your previous location.
- *Forward button*—The Forward button becomes available only after you click the Back button. If you navigate first to the Pictures folder, for example, and then to a folder named Grand Canyon, you can click the Back button to return to the Pictures folder. When you do, you can click the Forward button to open the next location in the sequence of folders, which is the Grand Canyon folder.
- *Recent locations button*—Click the Recent locations button to navigate to a location you've visited since you opened File Explorer.
- *Up one level button*—Click the Up one level button to navigate up to the folder containing the current folder. The ScreenTip for this button changes to reflect the folder to which you can navigate. For example, when you are working in the Pictures folder, the ScreenTip is Up to "This PC".
- *Address box*—The Address box displays your current folder as a series of locations separated by arrow buttons. Click a folder name such as Pictures or an arrow button to quickly navigate to a different location.

You use the Navigation pane and the Address bar in Step-by-Step 3.1 to explore your computer. First, you open File Explorer on the Windows desktop, and then display the contents of the Pictures folder, which is designed to contain your photos and other pictures. You compare that location to the Pictures library. A ***library*** displays similar types of files together, no matter where they are stored, so you can access them easily. In contrast, a folder stores files in a specific location. In the case of the Pictures folder, this location is usually a folder on Local Disk (C:).

VOCABULARY

library

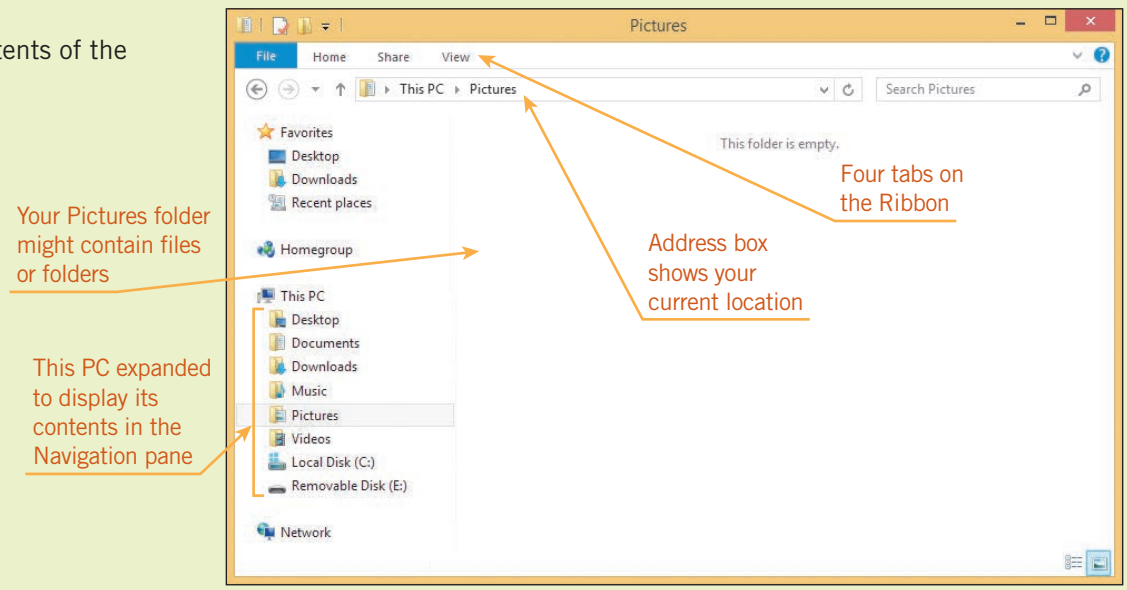
Like the Pictures folder, the Pictures library displays various folders and files containing images, such as photos. In addition, the Pictures library always provides special tools for working with pictures. When you navigate to the Pictures library, the Picture Tools Manage tab and the Library Tools Manage tab appear to the right of the standard Ribbon tabs (named File, Home, Share, and View). This type of tab is called a ***contextual tab***, and it contains options related to your current task or location. The Pictures Tools Manage tab also appears when you select an image file in the Pictures folder.

VOCABULARY
contextual tab

Step-by-Step 3.1

1. If necessary, click the **Desktop** tile on the Start screen to display the Windows desktop.
2. Click the **File Explorer** button on the taskbar. File Explorer starts with This PC selected in the Navigation pane and the label "This PC" displayed in its title bar.
3. If the contents of This PC do not appear in the Navigation pane, move the pointer into the Navigation pane to display expand icons, and then click the **expand** icon next to This PC.
4. In the Navigation pane, click the **Pictures** icon to display the contents of the Pictures folder. As shown in **Figure 3–4**, your Pictures folder might not contain any files.

FIGURE 3–4
Displaying the contents of the Pictures folder



5. In the Navigation pane, click the **Desktop** icon to display system resources your computer can access from the desktop.
6. In the right pane, double-click the **Libraries** icon to display the Documents, Music, Pictures, and Videos libraries, and then double-click the **Pictures** library to display its files. If any files or folders appeared in the Pictures folder when you performed Step 4, the same files and folders appear in the Pictures library.

7. If the Ribbon is collapsed, click the **Expand the Ribbon** button to expand it. If any folders or files appear in the right pane, click a file or folder to select it.
8. Click the **Picture Tools Manage** tab to display its buttons on the Ribbon, which you use to work with picture files. See **Figure 3–5**. For example, you could play the pictures as a slide show.

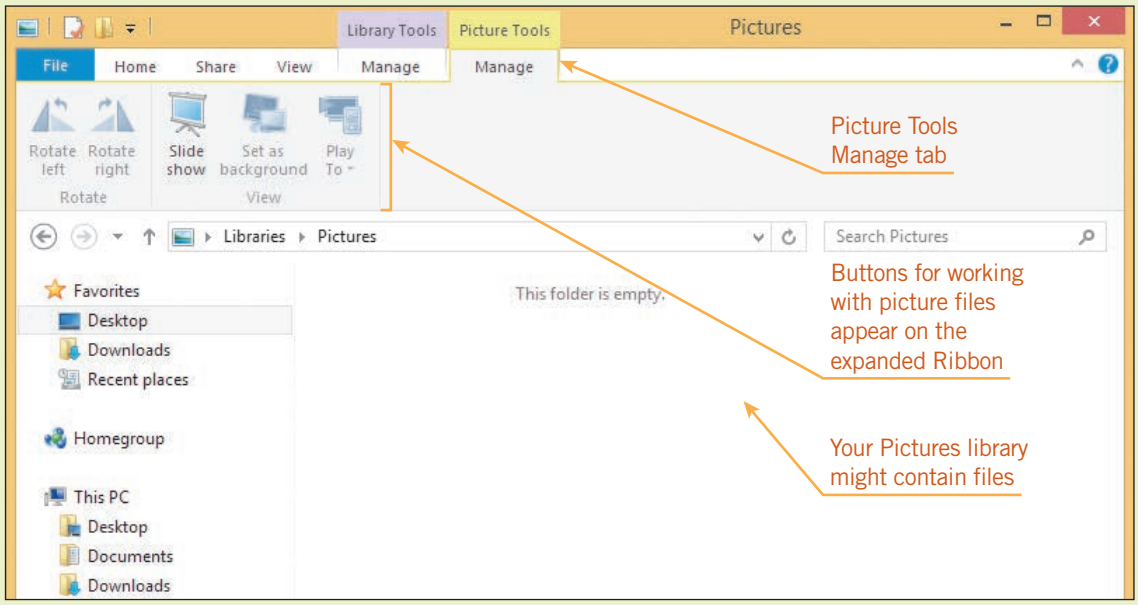


FIGURE 3–5
Picture Tools Manage tab in File Explorer

9. To practice navigating with buttons on the Address bar, click the **Back** button on the Address bar to again display the Libraries in the right pane. The Forward button is now active. Click the **Forward** button to display the Pictures library.
10. Click the **Home** tab on the Ribbon to display its buttons, and then leave File Explorer open for the next Step-by-Step.

Knowing how to use File Explorer to navigate the folders, devices, and drives on your computer will be useful as you access and work with your data files.

Navigating to Your Data Files

IC3 1-1.2.1

Many of the lessons in this book involve data files, which are files you use in the Step-by-Steps and the exercises at the end of each lesson. Typically, your instructor gives you the data files, often on a USB drive, or asks you to obtain the data files on your own from a location such as a drive on the school's network. The data files for this lesson are provided in a subfolder named Lesson 3, which is contained in a folder named Module 1. One of the files in the Lesson 3 folder is named Basics.docx. If the Module 1 folder is stored on a USB drive named Removable Disk E:, you could refer to the Basics.docx data file using the following notation:

Removable Disk (E:) ▶ Module 1 ▶ Lesson 3 ▶ Basics.docx

VOCABULARY
file path

This notation is called the ***file path***, and it indicates where a file is stored on your computer by leading you through the folder and file organization to your file. This file path has the following parts:

- *Removable Disk E:*—The drive name followed by a colon, which indicates a drive rather than a folder
- *Module 1*—A top-level folder on drive E
- *Lesson 3*—A subfolder in the Module 1 folder
- *Basics.docx*—The full filename of the file

A full filename includes three parts: the main part of the filename, which is provided by the creator of the file; the dot, or period, which separates the main part from the file extension; and the file extension, which is usually three or four characters that identify the file type. In the Basics.docx filename, the .docx extension identifies the file as one created in Microsoft Word.

In Step-by-Step 3.2, you use your folder navigation skills to navigate to the data files for this lesson. The following steps assume these files are stored on a USB drive named Removable Disk E:. If your files are stored in another location or on a drive with a different name, substitute that location or name for "Removable Disk E:" in the steps.

Step-by-Step 3.2

QUICK TIP

If you cannot access the data files for this lesson, see your instructor or technical support person for help.

1. If necessary, insert the USB drive containing your data files into the USB port on your computer. If your data files are stored on a different drive, make sure your computer can access that drive.
2. If the drives on your computer are not displayed in the Navigation pane in File Explorer, click the **expand** icon next to the This PC icon to display the drives.
3. Click the **expand** icon next to the drive containing your data files, such as Removable Disk (E:). Below the drive name, a list appears showing the folders on that drive.
4. If the list of folders does not include the Module 1 folder, continue clicking the **expand** icon to navigate to the folder that contains the Module 1 folder.

QUICK TIP

The filenames shown in Figure 3–6 display the main part of the filename only. Windows hides file extensions by default to make the names easier to read.

5. Click the **expand** icon next to the Module 1 folder to expand the folder, which contains folders for the lessons in Module 1.
6. In the Navigation pane, click the **Lesson 3** folder. The files it contains appear in the right pane. See **Figure 3–6**. The filenames shown in the figure display the main part of the filename only. Windows hides file extensions by default to make the names easier to read.

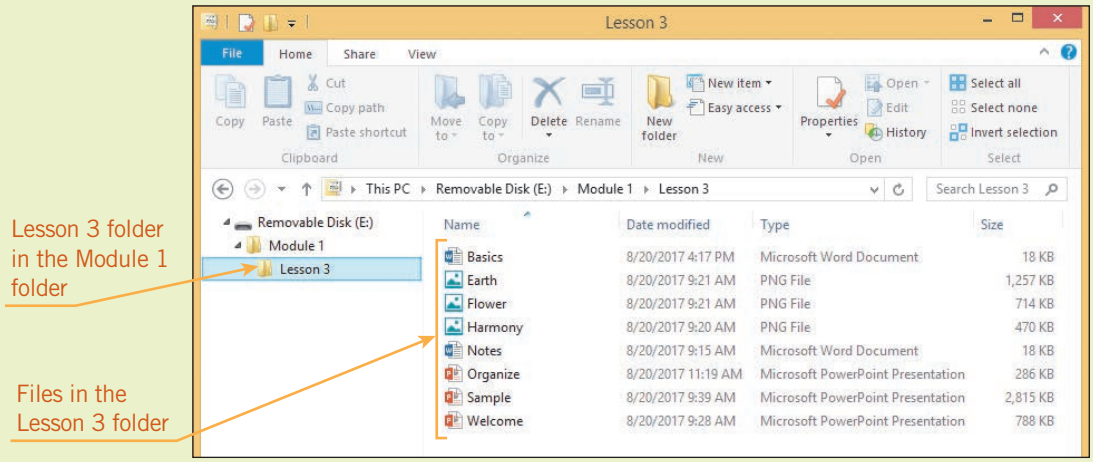


FIGURE 3–6
Navigating to the Lesson 3 folder

7. Leave File Explorer open for the next Step-by-Step.

Changing View Settings

1-1.2.1

Using File Explorer, you can view the contents of a folder in eight ways: Extra large icons, Large icons, Medium icons, Small icons, List, Details, Tiles, and Content. The default view for the Pictures folder is Large icons view, which provides a thumbnail image of the file contents for files containing graphics. When you display files containing graphics in Medium icons view or larger, the icon displays a preview of the file's content. For other folders, the default view is Details view, which displays a small icon instead of a thumbnail and lists details about each file.

Windows and other operating systems keep track of file details, which typically include the filename, file type, size, and date the file was created or modified. These file details can be seen in different views in File Explorer. In addition to the filename, the ***file type***, or ***file format***, indicates the type of data in the file. For example, a file with a PNG (for Portable Network Graphics) or JPG (for Joint Photographic Expert Graphics) file type contains graphics such as an illustration or photo. Some file types reflect the application used to create the file. For example, a file with a Microsoft Word Document file type was created using Microsoft Word. The file size indicates how much data the file contains. The data is measured in kilobytes (KB). One KB contains 1,024 characters, which is fairly small. For example, this paragraph contains about 1,000 characters. Graphics files usually contain much more data than a text file.

To change the File Explorer view setting to any of the eight views, you use the View tab on the Ribbon. To switch to Details view or Large icons view, you can use the view buttons on the status bar. You'll use both methods in Step-by-Step 3.3.

VOCABULARY
file type (file format)

QUICK TIP
The "Understanding File Types" section later in this lesson provides more information about file types.

Step-by-Step 3.3

1. In File Explorer, click the **Large icons view** button on the status bar. The view of the files changes from Details view to Large icons view, which shows the files as large icons or thumbnails and no file details except the filename. See **Figure 3–7**. Six of the icons display a preview of the contents because those files contain graphics. File icons depend on the applications installed on your computer, so the icons that appear in your window might differ.

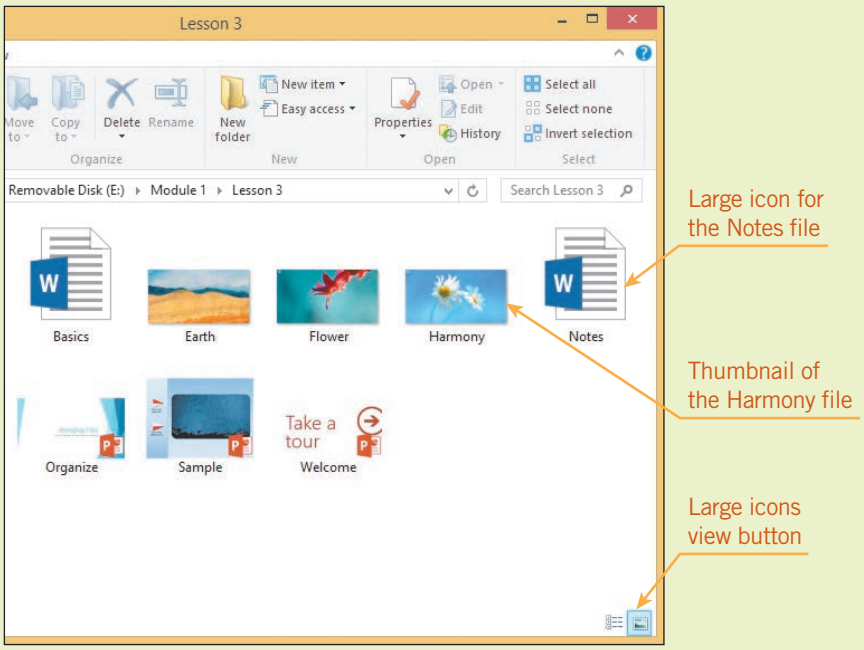


FIGURE 3–7
Files in the Lesson 3 folder in Large icons view

2. Click the **View** tab on the Ribbon to display buttons and other tools for changing the view of the window.
3. In the Layout group, click the **More** button to display the eight views, and then click **Tiles**. The file icons and thumbnails are now smaller and a few file details appear, including the filename, file type, and file size.
4. On the status bar, click the **Details view** button to switch to Details view. See **Figure 3–8**. Now small file icons appear along with the file-name, date modified, type, and size organized into columns.

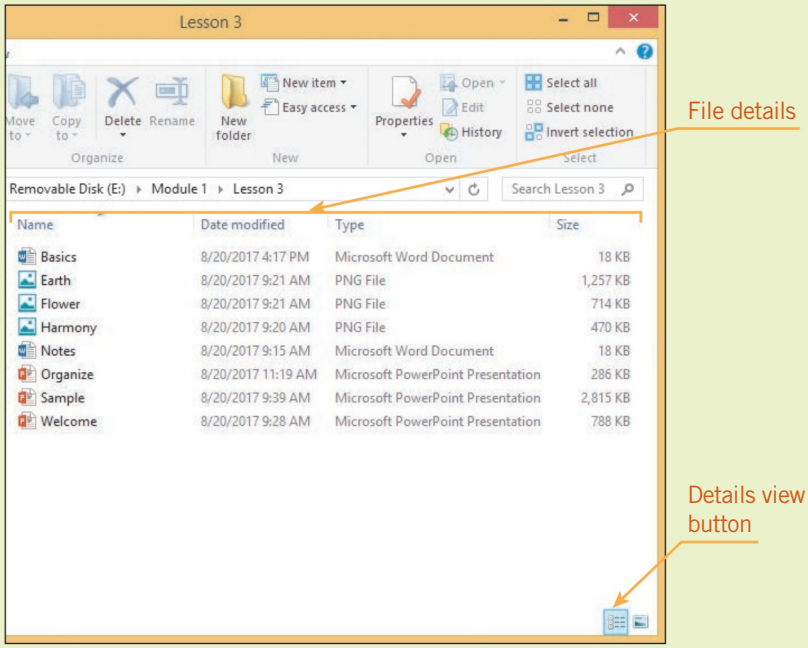


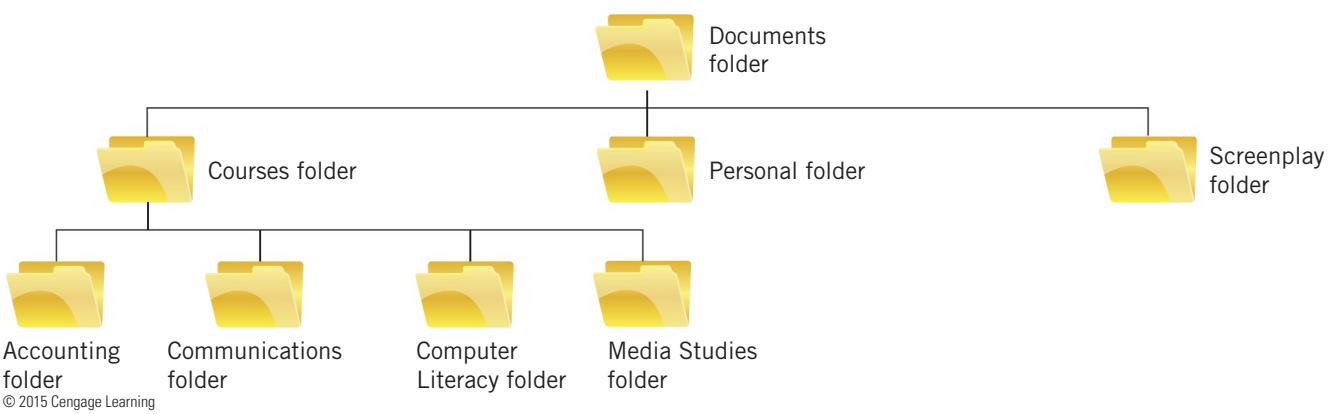
FIGURE 3–8
Files in the Lesson 3 folder in Details view

5. On the status bar, click the **Large icons view** button to return to Large icons view. Leave File Explorer open for the next Step-by-Step.

Managing Files

1-1.2.2

Managing files involves tasks that help you find files when you need them. These tasks include organizing the files into folders, deleting unnecessary files, and naming or renaming files so you can easily recognize their contents. To organize files, you group similar files together in a folder, preferably a subfolder in one of the Windows default folders, such as Pictures for graphics and Documents for text files. You should separate the files into subfolders depending on the purpose or subject matter of the files, and organize the subfolders from the top down. For example, a Courses folder might be a subfolder in the Documents folder. Within the Courses folder is a subfolder for each course you are taking, similar to the organization in **Figure 3–9**.



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FIGURE 3–9 Typical folder organization

Windows creates default folders only on the hard drive, not on removable media. If you are working with files on removable media, such as a USB drive, you can use folders stored in the root directory of the removable drive. For example, instead of using the Courses folder stored in the Documents folder on Local Disk (C:), you could use the Courses folder stored on Removable Disk (E:).

Do not store your files in the root directory of the hard disk, a folder containing system files (usually named Windows), or a folder containing software files (any folder in the Program Files or Program Files (x86) folder). Windows expects to find system files and the files for specific applications within certain folders. If you reorganize or change these folders, Windows can't locate and start the applications stored in those folders.

Creating Folders

Before you organize files, you must create folders to contain the files. You use File Explorer to create folders. (You use applications to create files.) Consider the data files for this lesson that are stored in the Lesson 3 folder. *Basics* and *Notes* are Microsoft Word files containing information about managing files. *Earth*, *Flower*, and *Harmony* are graphics files displaying Windows desktop backgrounds. *Welcome* and *Sample* are Microsoft PowerPoint files that show how to use some features of PowerPoint, an application you use to create presentations and slide shows. *Organize* is a PowerPoint file that explains how to organize files and folders in Windows.

One way to organize these files is to create three folders—one for file management, one for desktop background graphics, and another for learning PowerPoint. When you create a folder, you give it a name, preferably one that describes its contents. A folder name can have up to 255 characters. Any character is allowed, except / \ : * ? " < > and |. Considering these rules, you could create three folders containing files as follows:

- Backgrounds folder—Earth, Flower, and Harmony files
- File Management folder—Basics, Notes, and Organize files
- Learning PowerPoint folder—Sample and Welcome files

If you were organizing these files on a hard disk, you could create the Backgrounds subfolder in the Pictures folder. However, in Step-by-Step 3.4, you create folders on a removable disk, so you will create the three folders in the Lesson 3 folder. You will use File Explorer to create these folders using three methods: the Home tab on the Ribbon, a shortcut menu, and the Quick Access Toolbar. A ***shortcut menu*** is a menu that appears when you right-click an object on the screen. Shortcut menus list commands you can use with the object you right-clicked. For example, when you right-click the File Explorer window, the shortcut menu includes commands for working with files, such as changing the view of the window and creating a folder.

VOCABULARY
shortcut menu

Step-by-Step 3.4

1. Click the **Home** tab, and then in the New group, click the **New folder** button. A folder icon appears in the right pane. See **Figure 3–10**. The label "New folder" is selected below the folder so you can type to replace the text and give the folder a new name.

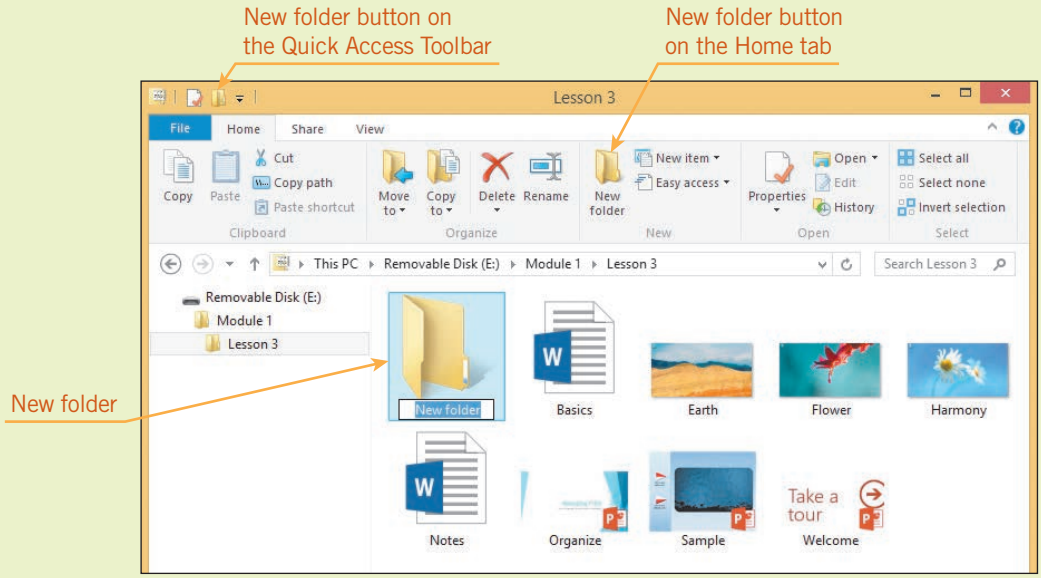


FIGURE 3–10
Creating a folder

2. Type **Backgrounds** as the folder name, and then press the **Enter** key. The new folder is now named Backgrounds and is stored in the Lesson 3 folder. To create the next folder, you will use a shortcut menu.
3. Right-click any blank area in the right pane, point to *New* on the shortcut menu, and then click **Folder**. As in Step 1, a folder icon appears in the right pane with the "New folder" text selected.
4. Type **File Management** as the folder name, and then press the **Enter** key. You will create the final folder using the Quick Access Toolbar.
5. On the Quick Access Toolbar, click the **New folder** button, type **Learning PowerPoint**, and then press the **Enter** key to create and name the folder. The Lesson 3 folder now contains three subfolders.

1-1.2.2

Copying and Moving Files and Folders

VOCABULARY

copy

move

Clipboard

To organize files into folders, you can copy or move the files. ***Copying*** places a duplicate of a file in a new location that you specify, which is the destination folder. ***Moving*** removes a file from its current location and places it in the destination folder.

As with creating folders, File Explorer provides several methods for copying and moving files and folders. Some methods use the ***Clipboard***, a temporary storage area for files and information that you copy or move from one place and plan to use somewhere else. **Table 3–2** summarizes the methods for copying and moving files and folders.

TABLE 3–2 Copying and moving files and folders

METHOD	TO COPY	TO MOVE
Shortcut menu	Right-click a file or folder, click Copy on the shortcut menu, right-click the destination folder, and then click Paste.	Right-click a file or folder, click Cut on the shortcut menu, right-click the destination folder, and then click Paste.
Keyboard shortcut	Click a file or folder, press the Ctrl+C keys, click the destination folder, and then press the Ctrl+V keys.	Click a file or folder, press the Ctrl+X keys, click the destination folder, and then press the Ctrl+V keys.
Home tab	On the Home tab, in the Organize group, click the Copy to button, and then click a location or click Choose location to open the Copy Items dialog box and navigate to the destination folder.	On the Home tab, in the Organize group, click the Move to button, and then click a location or click Choose location to open the Move Items dialog box and navigate to the destination folder.
Drag	If the destination folder is on a different drive, drag a file or folder to the destination folder.	If the destination folder is on the same drive, drag a file or folder to the destination folder.
Right-drag	Using a mouse, point to a file or folder, press and hold the right mouse button, and then drag the file or folder to a new location. Release the mouse button, and then click Copy here on the shortcut menu. (You cannot use this method on a touchscreen.)	Using a mouse, point to a file or folder, press and hold the right mouse button, and then drag the file or folder to a new location. Release the mouse button, and then click Move here on the shortcut menu. (You cannot use this method on a touchscreen.)

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In Step-by-Step 3.5, you use these methods to move and copy files as you organize them into the three folders you created in Step-by-Step 3.4.

Step-by-Step 3.5

1. In File Explorer, click the **Basics** file to select it, press and hold the **Ctrl** key, and then click the **Notes** file to select both files.
2. Position the pointer on one of the selected files, press and hold the mouse button, and then drag the files to the **File Management** folder. See **Figure 3–11**.

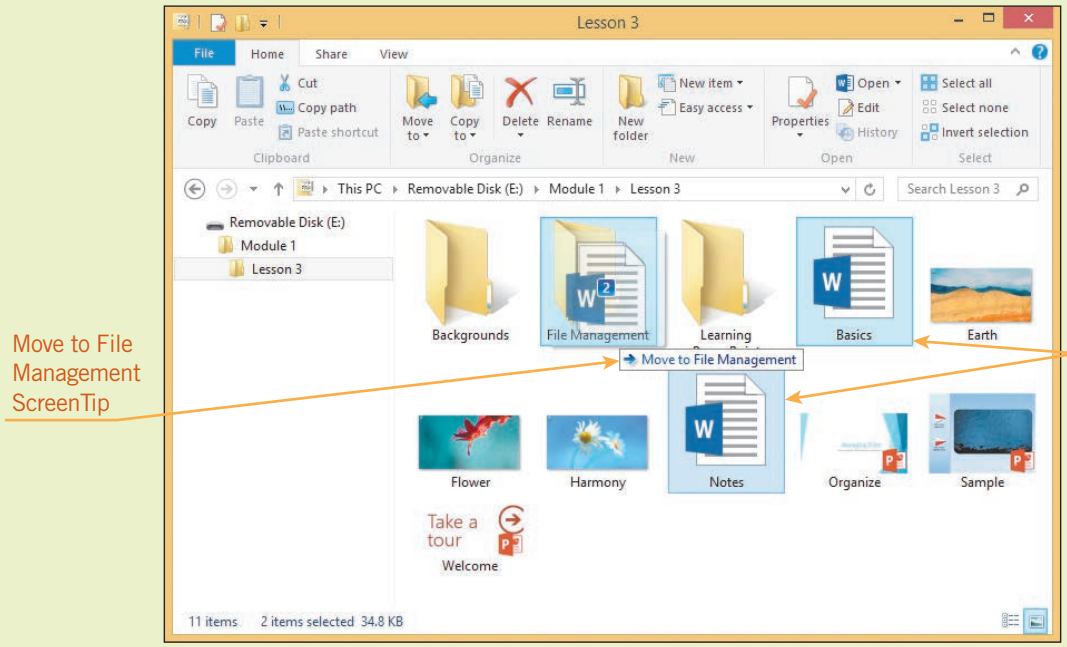
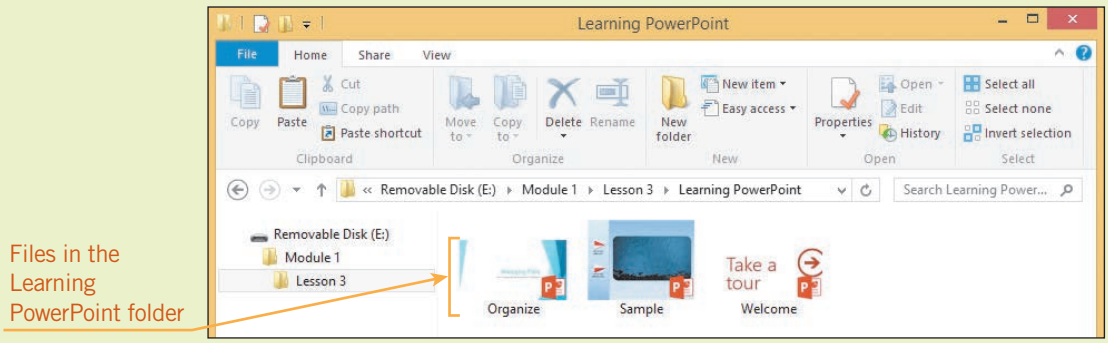


FIGURE 3–11
Dragging to move files

3. When the Move to File Management ScreenTip appears, release the mouse button. The files are moved into the File Management folder.
4. Click the **Earth** file to select it, press and hold the **Shift** key, and then click the **Harmony** file to select the three graphics files.
5. Right-click a selected file, and then click **Cut** on the shortcut menu.
6. Right-click the **Backgrounds** folder, and then click **Paste** on the shortcut menu to move the three graphics files to the Backgrounds folder.
7. Select the **Sample** and **Welcome** files, press the **Ctrl+X** keys, double-click the **Learning PowerPoint** folder, and then press the **Ctrl+V** keys to move the files.
8. Verify that the folders contain the files you moved by opening each folder in the Lesson 3 folder. Use the Navigation pane or click the **Back** button on the Address bar to navigate back to the Lesson 3 folder. Next, you can copy the Organize file to the File Management folder and to the Learning PowerPoint folder.
9. Click the **Organize** file to select it, press and hold the right mouse button, drag the **Organize** file to the **File Management** folder, release the mouse button, and then click **Copy here** on the shortcut menu.

10. Click the **Organize** file to select it (if necessary), click the **Copy to** button in the Organize group, and then click **Choose location** to open the Copy Items dialog box.
11. Scroll as necessary to the Lesson 3 folder, click the **Learning PowerPoint** folder, and then click the **Copy** button to copy the file.
12. Open the **Learning PowerPoint** folder to display its contents. See **Figure 3–12**.

FIGURE 3–12
Files moved and copied to a folder



IC3 1-1.2.2

Deleting Files and Folders

VOCABULARY
Recycle Bin

QUICK TIP
Some removable disks have Recycle Bins, but many do not. In most cases, a file you delete on a USB drive does not go into a Recycle Bin. Instead, Windows deletes the file when it removes the file icon, and you cannot recover the file.

You should periodically delete files and folders you no longer need to stay organized and reduce the clutter on your disks. You delete a file or folder in File Explorer by deleting its icon. When you delete a file from a hard disk, Windows removes the file from the folder but stores the file contents in the Recycle Bin. The ***Recycle Bin*** is an area on your hard disk that holds deleted files until you remove them permanently. When you delete a folder from the hard disk, the folder and all of its files are stored in the Recycle Bin. If you change your mind and want to retrieve a deleted file or folder, you can double-click the Recycle Bin icon on the desktop to display deleted files in File Explorer, right-click the file or folder you want to retrieve, and then click Restore on the shortcut menu. However, after you empty the Recycle Bin, you can no longer recover the files it contained.

In Step-by-Step 3.6, you delete the extra copies of the Organize file from the Learning PowerPoint folder and the Lesson 3 folder. (The File Management folder also contains a copy of the Organize file.) You'll delete the file using a shortcut menu and using the Delete key. At this point, File Explorer should display the contents of the Learning PowerPoint folder. If it does not, navigate to the Learning PowerPoint folder before performing the following steps.

Step-by-Step 3.6

1. In File Explorer, click the **Organize** file to select it, right-click the **Organize** file, and then click **Delete** on the shortcut menu to delete the file. If a dialog box appears asking if you're sure you want to delete the file, click the **Yes** button.
2. Navigate to the **Lesson 3** folder, and then click the **Organize** file to select it.
3. Press the **Delete** key to delete the file, and then click the **Yes** button, if necessary, to confirm you want to delete the file.

Renaming Files

1-1.2.2

Like folder names, filenames should reflect the contents of the file. The main part of a filename can have up to 255 characters, which is plenty of characters for a descriptive filename. You should be able to recognize the contents of a file by looking at the filename. You can use spaces and certain punctuation symbols in your filenames, but not the symbols / \ : * ? " < > or | because these characters have special meanings in Windows.

Keep the following guidelines in mind as you name files:

- *Use descriptive names*—Avoid names that might make sense now but could cause confusion later, such as MyFile or Info. Use filenames that are long enough to be meaningful, but short enough to be read easily on the screen.
- *Do not change the file extension*—If you change the file extension when naming a file, Windows might not be able to find a program that can open it.
- *Follow a pattern*—If possible, use a consistent naming scheme that is clear to you. For example, if you store many assignments in the same folder, the first assignment file could be named Assignment01, the next Assignment02, and so on.

Be sure to give your files meaningful names that will help you remember their purpose and contents. The easiest way to rename a file is to use the Rename command on the file's shortcut menu. You can also use the Rename button in the Organize group on the Home tab. In Step-by-Step 3.7, you rename the files in the File Management folder so the filenames are more descriptive.

Step-by-Step 3.7

1. Open the **File Management** folder to display its contents, and make sure you are in Large icons view so you have more room for renaming files.
2. Right-click the **Basics** file, and then click **Rename** on the shortcut menu. The filename is selected in a text box as shown in **Figure 3–13** so you can type to enter a new name.

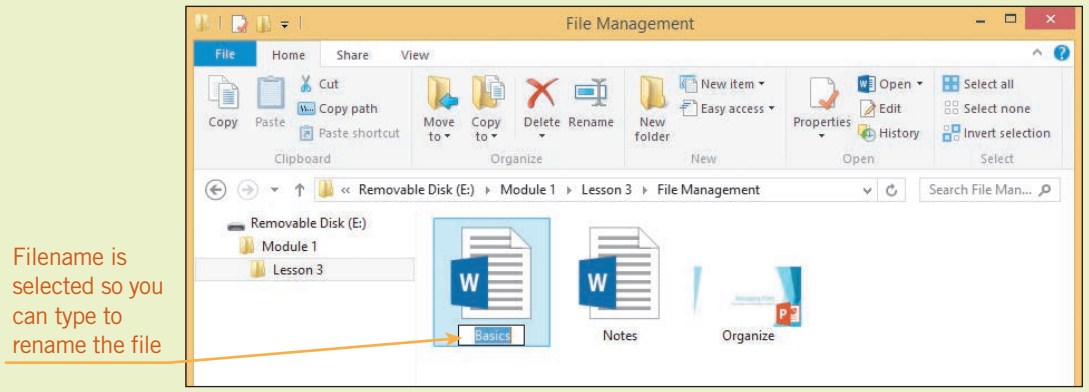


FIGURE 3–13
Renaming a file

3. Type **File Explorer Basics** and then press the **Enter** key to rename the file.
4. Click the **Notes** file to select it. On the Home tab, in the Organize group, click the **Rename** button.
5. Type **File Management Notes** and then press the **Enter** key.
6. Use either technique to rename the Organize file to **Organizing Files**.

1-1.2.2

Creating Shortcuts

VOCABULARY
shortcut
pin

In Windows, a ***shortcut*** is an icon or tile that provides a quick way to perform an action such as opening a folder or a file. You can create shortcuts in two places: on the Start screen and on the desktop. If you often use a folder soon after you sign in to Windows, you can add, or ***pin***, the folder to the Start screen, where it appears as a tile. Instead of displaying the desktop, starting File Explorer, and then navigating to the folder you want, you can click the folder's tile on the Start screen to immediately open the folder on the desktop.

In Step-by-Step 3.8, you pin the Backgrounds folder to the Start screen. You can pin folders located on the hard disk to the Start screen, but not folders on removable media such as a USB drive. Before you can pin the Backgrounds folder to the Start screen, you'll copy it to the Pictures folder on your hard disk. If you are working in a computer lab and are not allowed to access the Pictures folder, read but do not perform the following steps.

Step-by-Step 3.8

1. Navigate to the **Lesson 3** folder to display its contents.
2. Click the **Backgrounds** folder, and then press the **Ctrl+C** keys to copy the folder.
3. In the Navigation pane, click the **Pictures** folder to open the folder.
4. Press the **Ctrl+V** keys to paste the Backgrounds folder in the Pictures folder.
5. Right-click the **Backgrounds** folder, and then click the **Pin to Start** on the shortcut menu to pin the folder to the Start screen.
6. Click the **Start** button on the taskbar to display to the Start screen, and then scroll to the right to display the tile for the Backgrounds folder. See **Figure 3–14**. Your Start screen might look different.

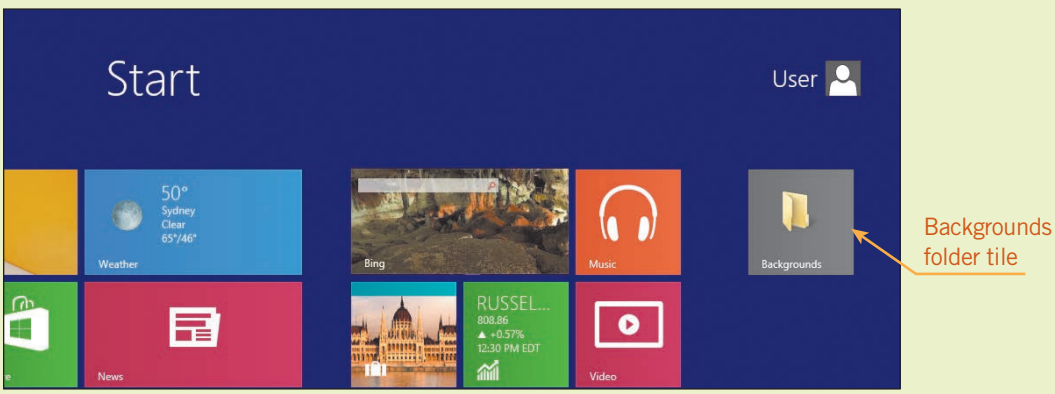


FIGURE 3–14
Folder pinned to the Start screen

7. To test the shortcut, click the **Backgrounds** tile on the Start screen. The folder opens in a new File Explorer window on the desktop.
8. Close the File Explorer window displaying the Backgrounds folder.

In addition to creating shortcuts on the Start screen by pinning folders, you can create shortcuts on the desktop to access drives, folders, files, Web pages, applications, or other computer resources, such as a network location. For example, you can open a folder directly from the desktop by creating a shortcut icon for the folder. You can double-click the shortcut icon on the desktop to open the folder, the same way that you double-click a folder icon in File Explorer. However, a shortcut icon is only a link to the actual folder. If you move the icon, you move only the shortcut, not the folder itself. If your desktop becomes cluttered, you can delete the shortcut icons without affecting the original folders, files, or other items. You can tell the difference between shortcut icons and other icons because shortcut icons include a curved arrow in the lower-left part of the icon.

An easy way to create a shortcut is to use the Send to command on the shortcut menu for a file, folder, or drive. In Step-by-Step 3.9, you use this technique to create a shortcut to the Learning PowerPoint folder on the desktop.

Step-by-Step 3.9

1. Open the **Lesson 3** folder to display its contents.
2. Right-click the **Learning PowerPoint** folder, point to *Send to*, and then click **Desktop (create shortcut)**.
3. If necessary, click the **Minimize** button in any open window to display the shortcut on the desktop. See **Figure 3–15**.

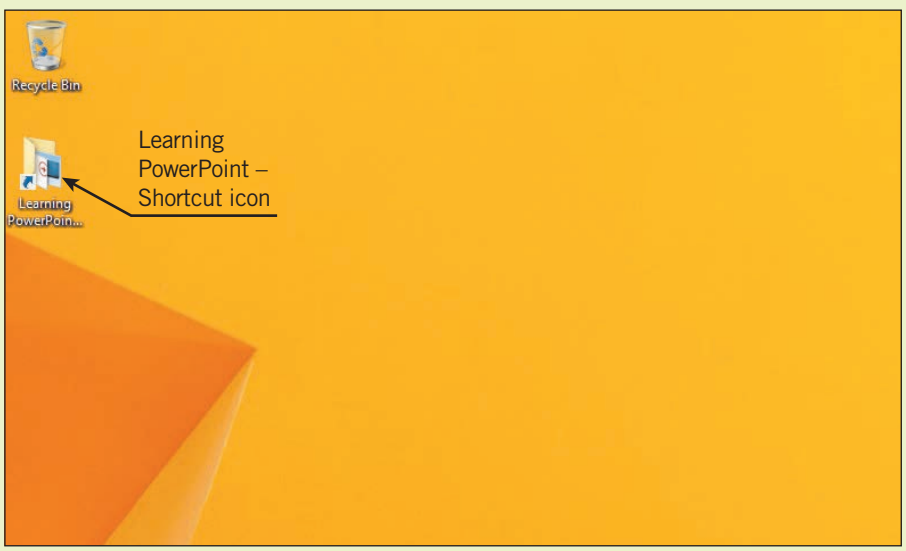


FIGURE 3–15
Folder shortcut on the desktop

4. To test the shortcut, double-click the **Learning PowerPoint – Shortcut** icon on the desktop. The Learning PowerPoint folder opens in File Explorer.

Searching for Files

IC3 1-1.2.2

Now that you've learned basic folder organization and navigation, you can easily find files if you know where they are stored. After navigating to that location, you can scan the file list to find a file. However, if your folders contain many files or you're not sure where a file is stored, you can use the Search box in File Explorer to find a file.

VOCABULARY
tag

The Search box appears next to the Address bar in the File Explorer window. To find a file in the current folder or any of its subfolders, you start typing text associated with the file into the Search box. Usually, this search text is part of the filename, though you can also search using ***tags***, which are keywords you associate with a file. As you enter the search text, Windows searches for files by examining the names of the files displayed in the current folder and files in its subfolders. If Windows finds a file whose filename contains a word starting with the search text you specify, it displays that file in the File Explorer window. For example, you might use the search text "note" to find the File Management Notes file.

If you are searching a hard drive, Windows also looks for files containing a word starting with your search text. For example, using "note" as the search text also finds the File Explorer Basics file on a hard drive because it contains the text "Take note of common file management problems." If you are searching a removable drive, by default Windows searches filenames only.

In Step-by-Step 3.10, you search the Lesson 3 folder for a file containing "flow" in its filename. The following steps assume you are searching a folder stored on a removable disk.

QUICK TIP

The name of the Search box reflects the folder or drive you are searching. If you open the Pictures folder, for example, the Search box name is Search Pictures.

Step-by-Step 3.10

QUICK TIP

If you are searching a hard drive, more than four files appear in the search results because Windows is searching the contents of the files in addition to filenames.

1. Navigate to the **Lesson 3** folder to display its contents.
2. Click in the **Search Lesson 3** box, and then type **f**. Windows examines the files in the subfolders of the Lesson 3 folder, searching for a filename that includes a word starting with "f." The one folder and four files in the Lesson 3 folder that do so are displayed in the search results. You can continue typing to narrow the selection.
3. Type **low** after the "f" so that the search text is now "flow." Windows displays the Flower file in the search results. See **Figure 3–16**.

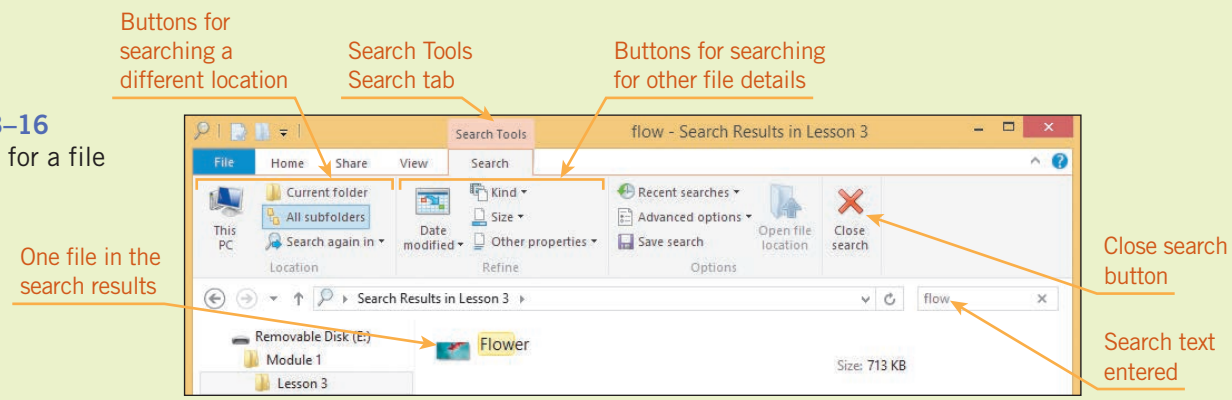


FIGURE 3–16
Searching for a file

4. Click the **Close search** button on the Search Tools Search tab to close the search results and return to the Lesson 3 folder.

You're finished working with the data files for this lesson, so you should restore the computer to its original state by removing the shortcuts you created on the Start screen and desktop and deleting the folder you created in the Pictures folder, if necessary. You restore the computer in Step-by-Step 3.11.

Step-by-Step 3.11

1. If you copied the Backgrounds folder to the Pictures folder, open the **Pictures** folder, click the **Backgrounds** folder, press the **Delete** key, and then click the **Yes** button, if necessary, to delete the folder. Close File Explorer.
2. On the desktop, click the **Learning PowerPoint – Shortcut** icon, press the **Delete** key, and then click the **Yes** button, if necessary, to delete the shortcut.
3. Click the **Start** button on the taskbar to display to the Start screen.
4. Scroll to the Start screen to the right, right-click the **Backgrounds** folder, and then click the **Unpin from Start** button on the Apps bar that appears at the bottom of the screen to unpin the folder from the Start screen.

Understanding File Types

1-1.2.3

A computer can contain three categories of files: system files, application files, and data files. ***System files*** are those necessary for running the operating system. They usually are found in the root directory of a personal computer and in the Windows folder of a Windows computer. On a Mac, system files are stored in the System folder. Linux computers keep system files in a folder named sys. An ***application file*** is part of an application, such as a word-processing application, and is a necessary file for running the software. These files are transferred to your computer when you install the application. A ***data file*** is one you create when working with an application, such as a document you write and format when working with Microsoft Word. Many system and application files are ***executable files***, which means they can perform tasks automatically when you open them. In contrast, data files display data such as text or images, or play a sound, music, or a video.

Recall that a file extension identifies the file type. It also identifies the broader category to which the file belongs. The system file category has the fewest file types. System files often have attributes set so they cannot be edited or deleted because those files are critical to computer operation. (A ***file attribute*** is a file detail or setting that can be turned on or off.) System files come only as part of the operating system or other system software. In a similar way, application files come only as part of software. Do not move, edit, or delete system or application files unless a computer expert gives you specific instructions to do so.

On the other hand, data files are designed for you to create, edit, and manage. You can learn valuable information about a file from the information listed in the Type column of File Explorer in Details view or from its file extension. For example, suppose you have two files named Get Organized, as shown in **Figure 3–17**.

VOCABULARY

system file

application file

data file

executable file

file attribute

WARNING

Unless you receive an executable file (one with an extension such as .exe) from a source you trust, do not open the file by double-clicking it. Doing so could trigger a virus or other malware to run on your computer with harmful results.

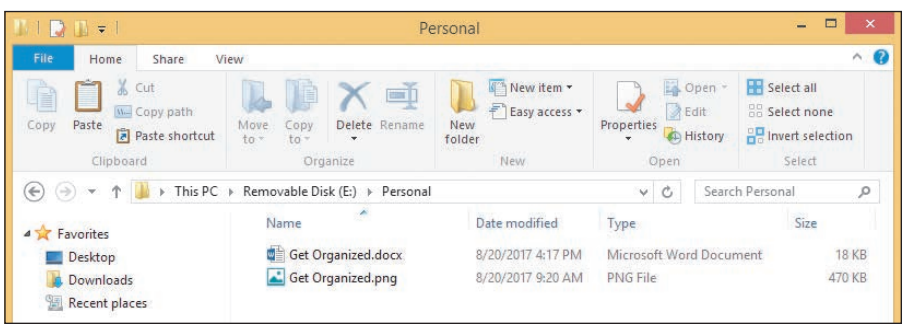


FIGURE 3–17 Identifying the file type

ABOVE AND BEYOND

When you create and save a file, the application you are using adds the extension automatically. However, although Windows keeps track of extensions, by default, it is not set to display them. To display file extensions in File Explorer, click the View tab, and then click the File name extensions check box in the Show/hide group to insert a check mark. When you select this check box, Windows includes file extensions for any file listed in File Explorer.

ABOVE AND BEYOND

The file type created by an application is called its native file format. When you save a file, the application uses its native file format by default to save the file. An application can always open a file in its native file format. In addition, it can open several other types of files. You can identify these file types in the application's Open dialog box, which usually includes a button or other control you can click to list the file types.

File Explorer identifies one of the files as a Microsoft Word Document; this file type has a .docx extension. File Explorer identifies the other file as a PNG file, which is a graphics file; this file type has a .png extension. Though the main parts of these filenames are identical, the file types distinguish them as different files.

The file extension also helps Windows identify what application should open the file. For example, if you double-click a file named Class Notes.docx in File Explorer, Microsoft Word opens the file so you can edit it. If the Type column in File Explorer includes the name of an application, that indicates the application is installed on your computer and is available to open the file. (If something is wrong with the file—if you change the file extension, for example—the application probably cannot open the file.)

For some file types, especially media files such as graphics, audio, and video, Windows does not identify an application, but lists the file extension in the Type column of File Explorer. These file types are not associated with a specific application, which can make it difficult to predict what happens when you double-click the files. Double-clicking a PNG file, for example, might open an application that only lets you view the picture or one that lets you edit it. When you need to specify an application to open a file, you can right-click the file, point to Open with on the shortcut menu, and then click the name of the application that you want to use.

You should be able to recognize common file types and their file extensions so you know which files to avoid (system and application files) and to identify applications you can use to open files. **Table 3–3** lists typical file types by category and identifies their file extensions and associated operating system or application.

TABLE 3–3 Categories of files and their file types

CATEGORY	COMMON FILE EXTENSION	OPERATING SYSTEM OR APPLICATION
System files	.dll, .ocx, .sys	Windows
Application files	.bat, .com, .exe	Windows
	.app, .osx	Mac OS X
	.bin	Linux, Mac OS X, Windows
	.out, .run	Linux
Data files		
Media	.avi, .mov, .mp4	Video application
	.jpg, .png, .tif	Graphics application
	.mp3, .m4a, .wav	Sound application
Office documents	.doc, .docx	Microsoft Word
	.mdb, .accdb	Microsoft Access
	.ppt, .pptx	Microsoft PowerPoint
	.xls, .xlsx	Microsoft Excel
Simple text	.rtf, .txt	Text editor
Other	.htm, .html	Web browser
	.pdf	Portable document reader or editor
	.zip	File compression utility

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TECHNOLOGY CAREERS

Computer Support Specialist

According to the Bureau of Labor Statistics, careers in the technology field are among the fastest growing in the nation. If you like to work with people and have an affinity for technology (an unusual combination), you can enter the technology field as a computer support specialist.

Also called technical support specialists or help desk technicians, computer support specialists assist computer users by offering advice on using computers and software and by troubleshooting computer problems. Much of the advice is basic file management knowledge. As a computer support specialist, you might work within an organization and provide help to other employees, or you might work for a technology organization and assist general computer users on the phone.

Some organizations require a bachelor's degree for their computer support specialists, while others require only an associate's degree or post-secondary school classes. Most organizations expect workers in this position to keep up with technology by attending training programs and enrolling in professional courses.

SUMMARY



In this lesson, you learned:

- You store files in folders, which are containers for related files, and on drives, which are storage devices. You use folders to organize your files on a drive.
- A computer can store folders and files on different types of disks, including removable media and hard disks. Before your computer can access a removable disk, you must insert the disk into a drive, which Windows names by assigning it a drive letter.
- Windows organizes the folders and files in a computer in a hierarchy called a file system. At the top of the file system is the root directory, which is where Windows stores system files and folders.
- The file management tool in Windows 8 is called File Explorer. You use File Explorer to display files and folders, navigate the Windows file system, and perform other file management tasks.
- To navigate a computer with File Explorer, you click expand icons in the Navigation pane until you find the folder that you want. Then, you click the folder icon in the Navigation pane to view the folders and files it contains, which are displayed in the right pane.
- A file path is a notation that indicates where a file is stored. A file path includes the drive name and letter, folder and subfolders, and the full filename.
- A full filename includes the main part of the filename, a dot, and the file extension, which is usually three or four characters that identify the file type.
- Using File Explorer, you can view the contents of a folder in eight ways, including Details view, which lists details about each file, and Large icons view, which displays a preview of the file's content if the file includes graphics.
- To organize files, you group similar files together in a folder, preferably a subfolder in one of the Windows default folders. Separate the files into subfolders depending on the purpose or subject matter of the files, and organize the subfolders from the top down.
- After creating folders and subfolders according to your file organization, you can copy and move files into the folders using several methods. Some methods use the Clipboard, a temporary storage area for files and information that you copy or move from one place and plan to use somewhere else.
- You should delete files and folders you no longer need to stay organized. When you delete a file from a hard disk, Windows removes the file from the folder but stores the file contents in the Recycle Bin until you remove them permanently.
- The names of folders and files should reflect their contents, and can contain up to 255 characters, except for certain characters that have special meanings in Windows.
- In Windows, a shortcut is a quick way to perform an action such as opening a folder or a file. You can create shortcuts on the Start screen and on the desktop.
- To find a file using File Explorer, you click the Search box and then start typing text associated with the file, such as a word in the filename.
- The three categories of files on a computer are system files, application files, and data files. A system file is one necessary for running the operating system. An application file is a necessary file for running the application. A data file is one you create when working with an application.
- You should be able to recognize common file types and their file extensions so you know which files to avoid (system and application files) and to identify applications you can use to open files.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The file type, or file format, determines the type of data in the file.

T F 2. After a file is sent to the Recycle Bin, you cannot retrieve it.

T F 3. The hard drive containing the operating system is named drive A by default.

T F 4. The title bar in the File Explorer window always displays the text "File Explorer."

T F 5. If you are searching files on a hard drive, Windows searches the file contents as well as the filename.

MULTIPLE CHOICE

Select the best response for the following statements.

1. A(n) _____ file is one you create when working with an application.
   A. executive C. system
   B. data D. application
2. The default view for any folder in the Pictures library is _____ view, which provides a thumbnail image of graphics files.
   A. Large icons C. Details
   B. Thumbnail D. Tiles
3. A(n) _____ provides a quick way to perform an action such as opening a folder or a file.
   A. pin C. arrow icon
   B. tile D. shortcut
4. The term _____ refers to a disk that is installed in the system unit.
   A. removable disk C. drive
   B. subfolder D. hard disk
5. A _____ is a notation indicating where a file is located on your computer.
   A. file extension C. file system
   B. file path D. file attribute

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What are you doing when you manage files?

2. Describe how you use the File Explorer Navigation pane to navigate to a file stored on your computer.

3. What is the difference between copying and moving a file?

4. Why might you want to create a shortcut by pinning a folder to the Start screen?

5. How would you find a file with the following file path: Removable Disk (E:) ▶ Courses ▶ Computer Literacy ▶ Syllabus.docx

6. What is the root directory? What types of files and folders are stored there?

7. Name two ways you can change the view of the File Explorer window.

8. How can you learn the file type of a particular file?

9. How can you retrieve a deleted file from the Recycle Bin?

10. Why shouldn't you store files in the root directory of the hard disk, a folder containing system files, or a folder containing application files?

PROJECTS

PROJECT 3–1

1-1.2.1

In this project, you use File Explorer to navigate parts of the Windows file system. You also learn how to take a screenshot, which is an image of the screen or the active window, and then use the Paint application to save the image as a png file. You take screenshots as you navigate with File Explorer. Submit the screenshots as your instructor requests.

1. Start File Explorer and then click the **Desktop** icon in the Navigation pane.
2. Press the **Print Screen** key to capture an image of the Desktop window and save it temporarily on the Clipboard. (The Print Screen key on your keyboard might be labeled Prt Scr or something similar.)
3. Display the Charms bar, click the **Search** charm, type **Paint**, and then press the **Enter** key to start Paint, a graphics application provided with Windows.
4. Press the **Ctrl+V** keys to paste the image of the Desktop window in Paint.
5. Click the **Save** button on Paint's Quick Access Toolbar. Use the Navigation pane in the Save As dialog box to navigate to the location where you save your data files. Click the File name box, type **Desktop** as the filename, and then press the **Enter** key to save the image as a file named **Desktop**. Minimize the Paint window.
6. In the Desktop window, double-click the **Recycle Bin** icon to open the Recycle Bin in File Explorer. Display its contents in Large icons view.
7. Press the **Print Screen** key to capture an image of the Recycle Bin contents.
8. In the Paint window, click the **File** tab, and then click **New** to start a new Paint file. Press the **Ctrl+V** keys to paste the image of the Recycle Bin contents in Paint.
9. Use the same technique as in Step 5 to save the image as a Paint file named **Recycle Bin**.
10. In File Explorer, navigate to the **Music** folder. Use the same technique as in Steps 7–9 to take a screenshot of the Music folder in File Explorer, saving the image as a Paint file named **Music**.
11. Close all open windows.

PROJECT 3–2

1-1.2.2

In this project, you work with the files you created in Project 3–1 by organizing them into a folder and performing other file management tasks with them. Some steps require you to perform new tasks or solve problems independently.

1. Start File Explorer, if necessary, and then navigate to the location where you store your data files, which should include the Desktop, Music, and Recycle Bin files.
2. Create a folder named **Screenshots**.
3. Move the **Desktop**, **Music**, and **Recycle Bin** files to the Screenshots folder.
4. Rename the Music file to **Music Folder**.
5. Right-click the **Desktop** file, point to *Open with* on the shortcut menu, and then click **Paint** to open the image in Paint.
6. On the Home tab, in the Tools group, click the **Text** button (which looks like an uppercase A), and then click a blank area of the image. Type your name, and then click a blank area to deselect the name. Click the **Save** button on the Quick Access Toolbar to save the Desktop file using the same name and location, and then close Paint.
7. Return to the Lesson 3 folder. Right-click the **Screenshots** folder, and then click **Create shortcut** to create a shortcut to the Screenshots folder.
8. Rename the Screenshots – Shortcut icon to **Project 3–2**.
9. Close the Lesson 3 window.

PROJECT 3–3

1-1.2.3

In this project, you use shortcut menus and Windows Help and Support to learn more about data file types, and then answer questions about what you learned. Submit the written answers as your instructor requests.

1. Use File Explorer to navigate to a folder that contains graphics files. (*Hint*: If you completed Projects 3–1 and 3–2, you can navigate to the Screenshots folder in the Lesson 3 folder.)
2. If necessary, display the files in Details view. What are their file types?
3. Right-click a graphics file, and then point to *Open with* on the shortcut menu. Which applications are listed?
4. Open the graphics file with any application except Paint. Which application did you choose? What happens when you select the application?
5. Close the application you started. If you started a Windows app, press the **Alt+F4** keys to close the app, and then click the **Desktop** tile to return to the desktop.
6. Press the **F1** key to open Windows Help and Support. On the Help home page, click the **Windows website** link in the "More to explore" area to display the Windows How-to home page in a browser. Use the Search box on this page to search for information about zip files.
7. Answer the following questions:
   - What does it mean to zip a file?
   - Why might you want to zip a file?
   - How can you open a file that has been zipped?
   - What is the file type of a compressed file when it appears in a File Explorer window?
8. Close all open windows.

TEAMWORK PROJECT

1-1.2.3

You are working at the help desk of a company that recently upgraded to the latest version of Windows. Your manager mentioned that employees are already curious about SkyDrive and what they can do with it. Work as a team of two to complete the following steps:

1. Use the Internet and Windows Help and Support as necessary to research SkyDrive, especially its purpose and requirements.
2. Work on your own to research SkyDrive and how to use the SkyDrive app and the SkyDrive Web site to save and access files. Store at least one file on SkyDrive and then share it with your partner.
3. Take a screenshot of the file on SkyDrive that your partner is sharing with you. Submit the file as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 3–1

You are considering purchasing a new Windows computer, and plan to use it for your course work. Consider how you will organize the data files you create and save for your courses.

1. Describe or sketch an organization plan that shows the folders where you will save files for your courses.
2. Consider using a consistent filenaming scheme and provide examples of filenames you might use.
3. Submit the description or sketch as your instructor requests.

CRITICAL THINKING 3–2

1-1.2.1

In this exercise, you explore additional tools available in File Explorer beyond those you learned about in this lesson. Answer questions as you complete the following steps, and then submit the answers as your instructor requests.

1. Start File Explorer, and then click the **File** tab. What is the Frequent places list? How can you use it to navigate folders?
2. Navigate to a folder that contains at least one subfolder and one file, select a file, and then click the **Home** tab, if necessary. What is the difference between the Copy button and the Copy to button?
3. Select a subfolder in the current folder, and then click the **Easy access** button. What does this button allow you to do?
4. Select a file, and then click the **Share** tab. What do the buttons in the Send group allow you to do?
5. Click the **View** tab and then experiment with the buttons in the Current view group. How might you use these buttons?

ONLINE DISCOVERY

ONLINE DISCOVERY 3–1

File Explorer is the file manager in Windows 8, while Mac OS X uses a tool called Finder. Research Finder on at least two Web sites and then answer the following questions. Submit the written answers as your instructor requests.

1. How do you start Finder?
2. What is the sidebar?
3. What appears in the Favorites section of the sidebar?
4. How do you display all of your files in Finder?
5. How do you change the view in Finder? What are the views you can use to display files and folders?
6. How do you search for files in Finder? What is the search tool called?

ONLINE DISCOVERY 3–2

IC3 1-1.2.3

The Web is your best source for learning about file types. Research the following file extensions on the Web and then list which application you can use to open files in each format. Also identify the kind of data created by each file type. For example, .docx files are word-processing documents you create with Microsoft Word. Submit the written answers as your instructor requests.

1. .aiff
2. .flv
3. .txt
4. .msg
5. .svg

JOB SKILLS

On the job, you probably have your own computer or one you share with other employees. Most likely, you are expected to manage your own files. Take the initiative and develop guidelines to follow when storing files. Complete the following steps.

1. Based on what you learned in this lesson, create a presentation using a presentation application such as Microsoft PowerPoint or create a report using a word-processing application such as Microsoft Word.
2. Design the presentation or report as if you were training fellow employees to manage files. Explain why you need to manage files effectively and how to do so in Windows 8. Include screenshots to illustrate your points. Be sure to cover the following information:

IC3 1-1.2.1 1-1.2.2

   - Reasons for managing files
   - Navigating in File Explorer
   - Designing a file organization
   - Creating and naming folders
   - Saving, naming, moving, and copying files
3. Submit the presentation or report as your instructor requests.

EXPLORE AND SOLVE

Did you know?

- When you are working with a folder window in Details view, you can refine the organization of your files by sorting them.
- You can also filter files to display only the ones you need.

1. Open File Explorer, and then navigate to a folder containing many data files. Open at least one file, and then save it in the same location but with a different name. Close the application you used to open the file.
2. If necessary, switch to Details view.
3. Click the **Type** column heading to sort the files in ascending order according to file type.
4. Press the **Print Screen** key to take a screenshot of the File Explorer window, and then save the image as a Paint file named **Sort by Type**.
5. Click other column headings to sort the file list by different file details.
6. Point to the *Date modified* column heading, and then click its **arrow** button to display a list of filtering options. Click the **Today** check box to select today's date and filter the files by displaying only the file(s) modified today. Click a blank area of the window to close the filtering options.
7. Press the **Print Screen** key to take a screenshot of the File Explorer window, and then save the image as a Paint file named **Today Filter**.
8. Click the **check mark** on the Date modified column heading, and then click the **Today** check box to remove the filter. Click a blank area of the window to close the filtering options.



Estimated Time:
2 hours

LESSON 4

Operating System Customization

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe the PC settings screen and the Control Panel.
- Change the Start screen background.
- Personalize the desktop.
- Set accessibility options.
- Customize power options.
- Set up and change a user account.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

accessibility
Administrator account
cloud computing
color scheme
group policy
hibernation
hybrid sleep
localize
local-only user account
Microsoft account
notification
password
permission
power plan
power state
property
right
screen saver
SkyDrive
Standard account
system time
theme
user credentials

Microsoft product screenshots used with permission from Microsoft Corporation.

After using a computer for a short while, most people want to customize parts of the user interface to suit their preferences. In this chapter, you explore three tools Windows provides for customizing the operating system: the Personalize menu, the PC settings screen, and the Control Panel. You start by changing the appearance of the Start screen, the desktop, folder icons, and window elements. You'll also learn how to set the date and time and select options to make Windows more accessible to all users. To conserve energy, you'll learn how to change power options and select power plans. Finally, you'll work with user accounts to determine what types of tasks users can perform.

Changing the Start Screen Background

One of the first preferences that users set in Windows 8 is the appearance of the Start screen. You can do so by changing the background design and selecting different background and accent colors. Especially if you use a computer for many hours a day, you should set appearance preferences so the interface is appealing to you.

To change the Start screen background, you use the Personalize menu, which opens on the right side of the Start screen. As you make selections on the Personalize menu, you can observe the changes on the Start screen.

In Step-by-Step 4.1, you change the Start screen background by selecting a background design, background color, and accent color. Note your current settings so you can restore them at the end of these steps.

Step-by-Step 4.1

1. On the Start screen, point to the lower-right corner to display the Charms bar, and then click the **Settings** charm to display the Settings menu. See **Figure 4–1**.

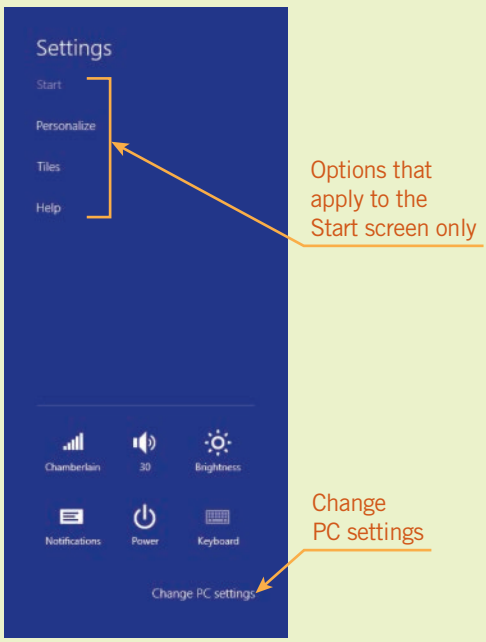


FIGURE 4–1
Settings menu

2. Click **Personalize** on the Settings menu to display the Personalize menu, which lists options for personalizing the Start screen.
3. Click a background design, such as the fourth design in the first row. The Start screen changes to display the design you selected and the colors associated with that design. See **Figure 4–2**.



FIGURE 4–2 Changing the Start screen background

4. In the Background color area, click a background color, such as dark orange (the fifth square from the left in the bottom row). The Start screen background and the top part of the Personalize menu now appear in the shade of dark orange shown in the Background color palette.
5. In the Accent color area, click an accent color, such as orange (the sixth square from the left in the bottom row). A few elements of the Start screen design now appear in the shade of orange shown in the Accent color palette. Next, you will restore your original settings.
6. Click the original design used for your Start screen, which also restores your original background and accent colors.
7. Click a blank area of the Start screen to close the Personalize menu.

QUICK TIP

You can display the desktop background as the Start screen background by selecting the desktop design on the Personalize menu.

1-1.3.1

Using the PC Settings Screen

Now that you've worked a bit with Windows 8, you've probably noticed that the operating system uses two main interfaces: the one that displays the Start screen and Windows 8 apps, and the other that displays the desktop, its windows, and applications. Consequently, you use different tools to customize these interfaces. The PC settings screen provides access to nine categories of settings you can adjust when using the Start screen and Windows 8 apps. Each of these categories includes settings that apply only to the Start screen environment. The other settings are system-wide settings that also apply to the desktop. **Table 4–1** describes each category on the PC settings screen.

VOCABULARY

SkyDrive

notification

TABLE 4–1 PC settings categories

CATEGORY	USE TO
PC and devices	Change appearance settings, display a list of devices connected to your computer, and add a new device.
Accounts	Add a user and change your password and other settings for your user account.
SkyDrive	Select settings for working with ***SkyDrive***, a location on a Microsoft server that Windows and some applications can access.
Search and apps	Change how Windows searches when you use the Search charm. Also, display information about apps, such as those that can display ***notifications***, which are messages that appear in the upper-right corner of the screen.
Privacy	Allow or block apps from sharing your geographic location and other personal information.
Network	Select network settings, such as which wireless network connection to use, if any.
Time and language	Change the date, time, region, and language on your computer.
Ease of Access	Make Windows easier to use for people with vision, hearing, or other physical impairments.
Update and recovery	Select settings for Windows Update, file backups, and system recovery.

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ABOVE AND BEYOND

On a Mac, you use the System Preferences window to customize the operating system. On an iPad or iPhone, you select the Settings icon and then select options in the General category to set preferences.

You can access the PC settings screen by using the Settings charm on the Start screen and then clicking the Change PC settings command. You can also use the Search menu to display the options for a particular category on the PC settings screen. You'll practice both methods in Step-by-Step 4.2 by displaying options for customizing the lock screen, a screen that might appear when your computer starts to display a picture, the date, and the time.

Step-by-Step 4.2

1. Point to the lower-right corner of the screen to display the Charms bar, and then click the **Settings** charm to display the Settings menu.
2. Click **Change PC settings** to display the PC settings screen. By default, the PC settings screen opens to display the PC and devices category and the Personalize option. See **Figure 4–3**.

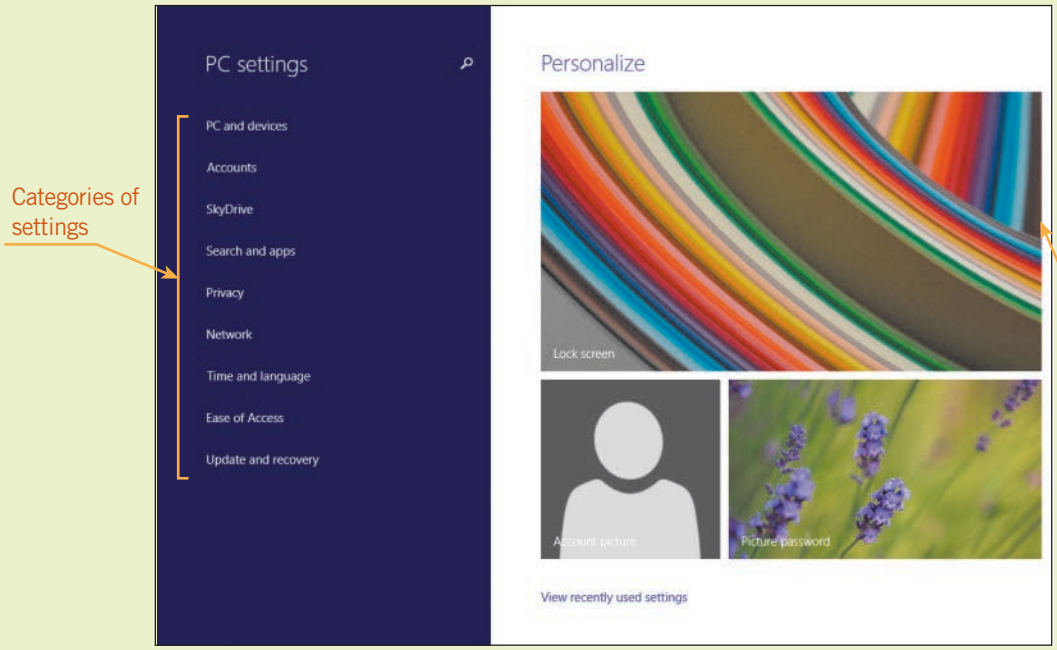
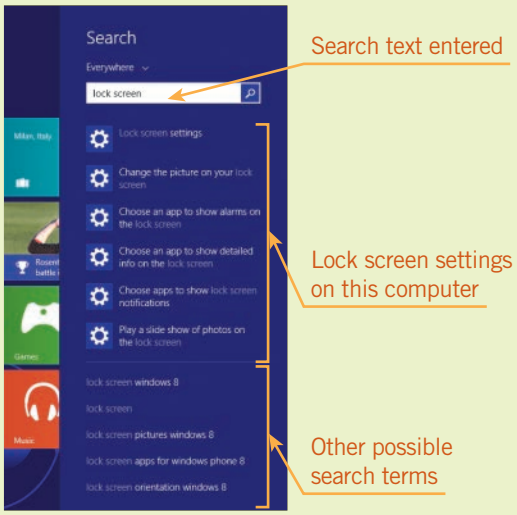


FIGURE 4–3
PC settings screen

3. In the right pane of the PC settings screen, click **Lock screen** to display the options for customizing the Lock screen. You can also access these options using the Search menu.

4. Press the **Alt+F4** keys to close the PC settings screen and display the Start screen, and then begin to type **lock screen**. The Search menu opens with the text you typed entered in the Search box. The search results show Windows settings related to the lock screen. See **Figure 4–4**.

FIGURE 4–4
Searching for lock screen settings



5. Click **Lock screen settings** in the search results to display the options for personalizing the lock screen.
6. Point to the lower-left corner of the screen, and then click the **Start** button to display the Start screen while leaving the PC settings screen open for a later Step-by-Step.

IC3 1-1.3.1

Using the Control Panel

VOCABULARY
property
theme

Recall that the Control Panel is a window that contains specialized tools you use to change the way Windows looks and behaves. All of the Control Panel tools provide access to dialog boxes that let you select or change the ***properties***, or characteristics, of an object or group of related objects. Most Control Panel tools affect the entire system. For example, you can set options to conserve power, which apply to the desktop and the Start screen environments. Some tools apply to the desktop only. For example, you use the Personalize tool to change the ***theme***, which is a desktop background and a set of colors, sounds, and other elements that appear by default in the desktop environment only.

Many Control Panel categories are similar to the ones on the PC settings screen. For example, both the Control Panel and PC settings screen have an Ease of Access category. The options you can set in each category differ, however. If an option affects only the Start screen or Windows apps, it appears on the PC settings screen. If an option affects only the desktop, it appears in the Control Panel. Some options that affect both the Start screen and the Control Panel environments appear in both the PC settings screen and the Control Panel.

You worked with the Control Panel in Lesson 2 when you explored Windows Update. The Home page of the Control Panel is shown again in **Figure 4–5** to illustrate the tools available for customizing Windows and the desktop.

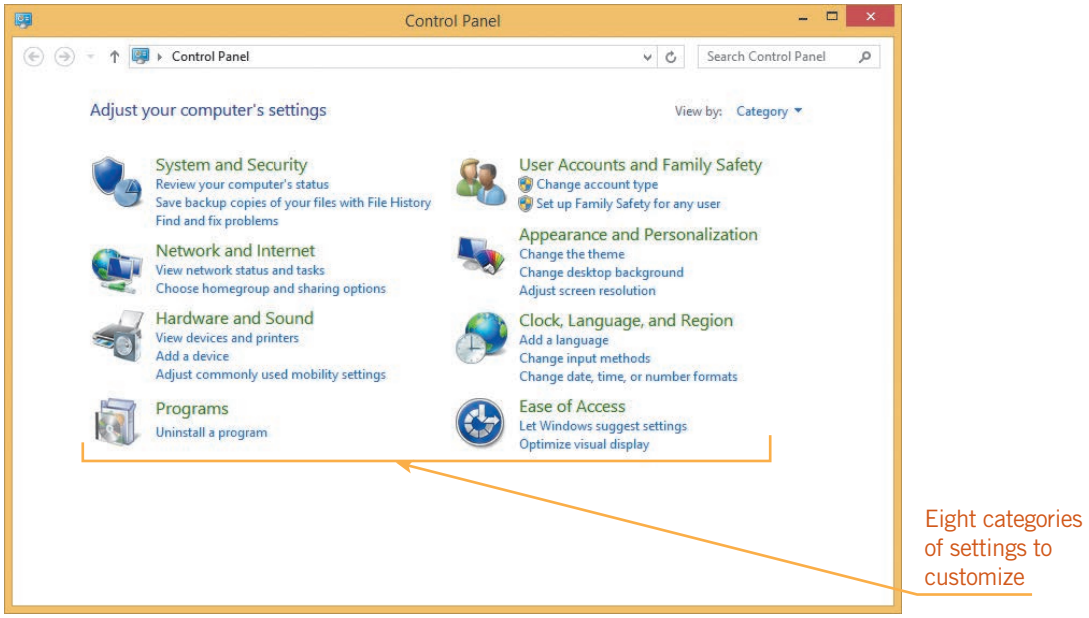


FIGURE 4–5 Home page of the Control Panel

The Home page includes eight categories of settings you can customize. **Table 4–2** describes each category.

TABLE 4–2 Control Panel categories

CATEGORY	DESCRIPTION
System and Security	Set options for maintaining the system, such as by using Windows Update, and for keeping the system secure.
Network and Internet	Set Internet options, view network status, and perform other network tasks.
Hardware and Sound	Change the sounds on your computer, and change the settings for your printer, keyboard, mouse, camera, and other hardware.
Programs	Install and uninstall desktop applications and Windows features, and set options for default settings and applications.
User Accounts and Family Safety	Change user account settings and passwords.
Appearance and Personalization	Change the appearance of desktop items, apply a theme or screen saver, and customize the taskbar. Applies only to the desktop.
Clock, Language, and Region	Change the date, time, and time zone; the language you use on your computer; and the format for numbers, currencies, dates, and times.
Ease of Access	Change computer settings for vision, hearing, and mobility.

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1-1.3.1

VOCABULARY

color scheme

screen saver

Personalizing the Desktop Appearance

The easiest way to personalize the desktop in Windows is to select a theme. When you do, your selections affect four elements: the desktop background image; the colors for window borders and the taskbar (called a ***color scheme***); the collection of sounds that play to signal system tasks, such as shutting down Windows; and the screen saver. Some themes are classified as Windows themes, which contain high-resolution photographic images. Windows also provides a few high-contrast themes, which make the items on your screen easier to see, especially if you have impaired vision.

You can select one of the images in a Windows theme to display as the desktop background, or you can play a slide show of the images displayed at specified intervals. To create a cohesive look, you can select a color scheme and set a ***screen saver***, an animated design or image that appears after the computer has been idle for a specified amount of time.

In Step-by-Step 4.3, you change the desktop theme using the Control Panel. First, you make sure the Control Panel is displayed in Category view to match Figure 4–5. You can also display the Control Panel in Large icons view or Small icons view, which both list the Control Panel tools in alphabetical order. Large icons view shows larger icons for the tools, while Small icons view shows smaller icons but more tools to minimize scrolling. In Category view, changing the theme is included in the Appearance and Personalization category, which provides tools for customizing the appearance of the desktop. Keep in mind that changing the desktop theme does not affect the appearance of the Start screen or Windows 8 apps.

Step-by-Step 4.3

1. On the Start screen, type **Control Panel**, and then click the **Control Panel** icon in the search results to display the Control Panel Home page.
2. Click the **View by** button in the upper-right corner of the Control Panel window to display the view options. If Category is not selected, click **Category** to display the window in Category view. Otherwise, click a blank area of the Control Panel window to close the View by menu.
3. Click the **Appearance and Personalization** category to display its tools. See **Figure 4–6**. Some tools are available depending on the hardware and software installed on your computer, so your window might look different. The tools listed in the Appearance and Personalization window are also organized into categories. Like all Control Panel category windows, this window lists tasks and tools in the right pane and links to the Control Panel Home page and other categories in the left pane.

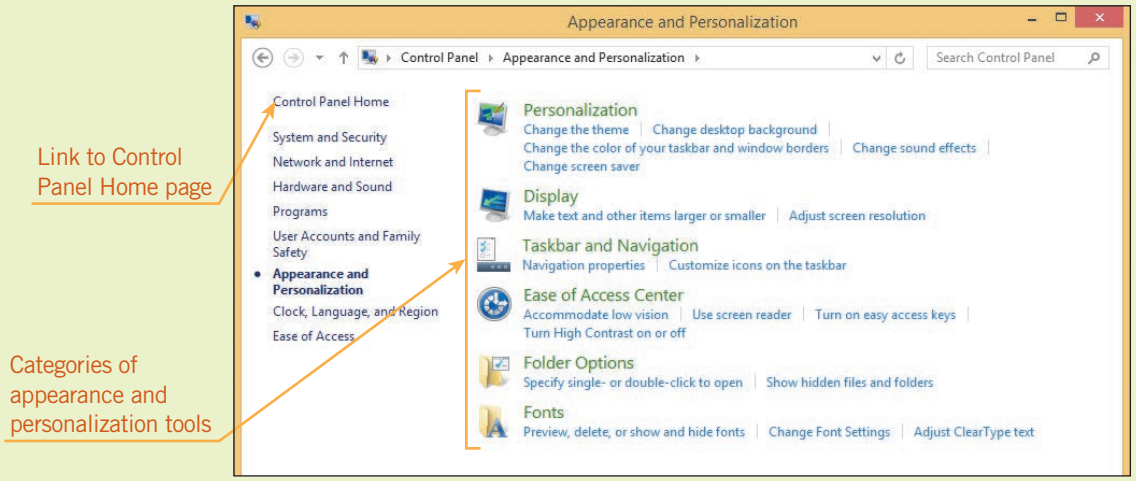


FIGURE 4–6
Appearance and Personalization window

4. In the Personalization category, click **Change the theme** to display the Personalization window. Note your current theme so you can restore it later. The computer shown in **Figure 4–7** includes three default themes. The Windows theme is the selected theme, and it displays a single background image. The Lines and colors and the Flowers themes play a slide show of background images.

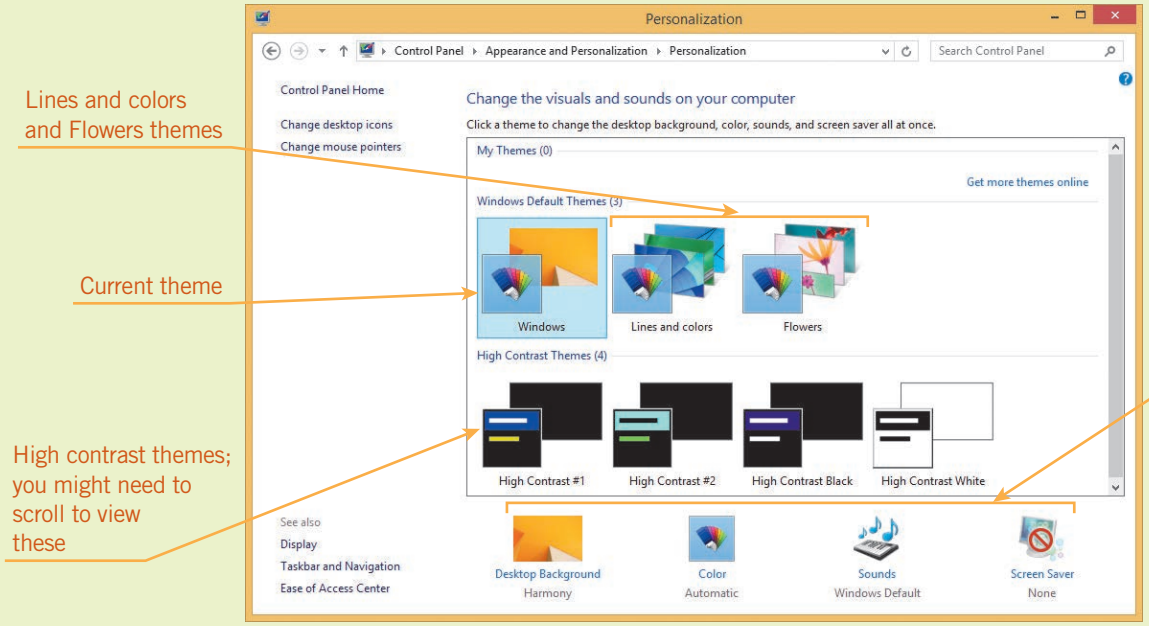


FIGURE 4–7
Personalization window

At the bottom of the window are four icons indicating the elements of the current theme, which include the desktop background (a single image named Harmony), the color scheme (colors automatically selected for the Windows theme), sounds (the default for the Windows theme), and the screen saver (none in this case).

QUICK TIP

To customize a theme, click an option at the bottom of the Personalization window to change the desktop background image, color scheme, sounds, or screen saver.

5. Click the **Flowers** theme to change themes. The desktop displays a background image in the collection of Flowers images. The Desktop Background icon now indicates that this theme plays a slide show rather than a single image. The colors of the taskbar and the windows borders and title bar change to those in the Flowers color scheme.
6. To see how the new theme affects the desktop and other windows, minimize the Personalization window, and then click **File Explorer** button on the taskbar. See **Figure 4–8**.

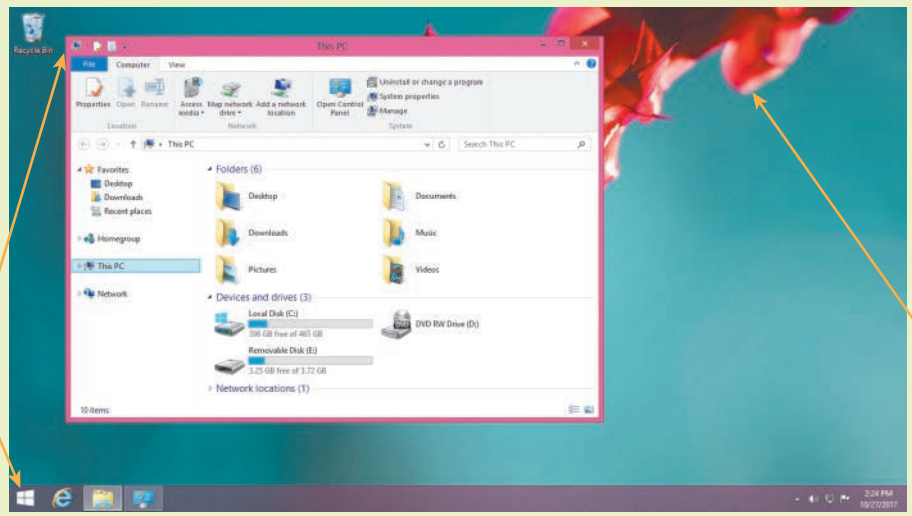


FIGURE 4–8
Desktop and File Explorer displayed in the Flowers theme

7. Click the **Control Panel** button on the taskbar to return to the Personalization window, and then click your original theme, such as the Windows theme, to restore the desktop to its original appearance.
8. Leave the Control Panel open with the Personalization category displayed for the next Step-by-Step.

Customizing Desktop and Folder Icons

1-1.3.1

Besides changing the desktop theme, you can change the appearance of the icons on the desktop. By default, only the Recycle Bin icon appears on the desktop. You can use the Desktop Icon Settings dialog box to add other icons for tools you use often, such as the Control Panel, to the desktop. From this dialog box, you can open the Change Icon dialog box to change the appearance of the desktop icons. For example, you could change the appearance of the Recycle Bin icon to an image that reminds you it contains deleted files. You can also use the Change Icon dialog box to change the appearance of a folder icon. For example, you can select an icon that reflects the folder's contents, such as music files. To change a folder icon's appearance, you must select a folder in its physical storage location, not in a library. Changing icons can enhance the appeal of your computing environment in general and make the icons more meaningful and useful to you.

In Step-by-Step 4.4, you change the Recycle Bin icon on the desktop. The Recycle Bin icon has two images: one that appears when the Recycle Bin is in an empty state, and another that appears when it is in a full state, meaning there are deleted items in it. You'll change the icon that matches the current state of the Recycle Bin on your desktop. You also change the icon for a folder stored on a USB drive. Insert the USB drive containing the data files for this book before you perform the following steps.

ABOVE AND BEYOND

Another way to customize folder icons is to show a picture of your choice as part of the icon. To do so, right-click the folder icon, and then click Properties on the shortcut menu. Click the Customize tab in the folder's Properties dialog box, and then click the Choose File button. Navigate to a picture file stored on your computer, and then select it to add the picture to the default folder icon.

Step-by-Step 4.4

1. In the left pane of the Personalization window, click **Change desktop icons** to open the Desktop Icon Settings dialog box. See **Figure 4–9**. If you wanted to add icons to the desktop, you could use the Desktop icons section of the dialog box to choose one or more icons to display on the desktop.

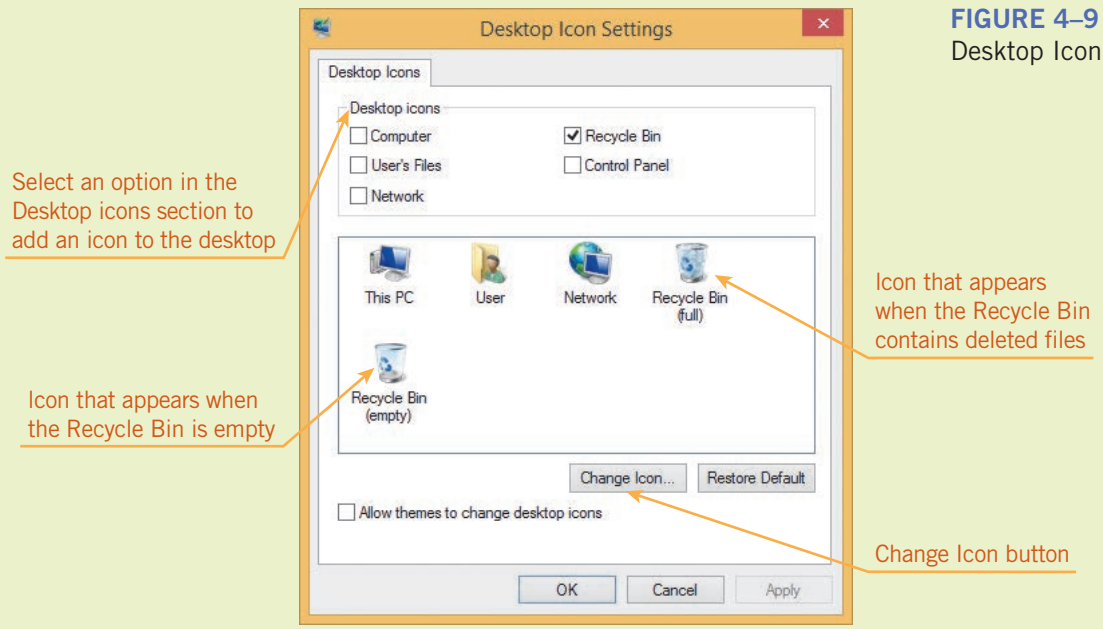


FIGURE 4–9
Desktop Icon Settings dialog box

2. If your Recycle Bin contains deleted files, click the **Recycle Bin (full)** icon in the Desktop Icon Settings dialog box. If your Recycle Bin is empty, click the **Recycle Bin (empty)** icon. Click the **Change Icon** button to open the Change Icon dialog box. Scroll to the right to select the large red X associated with deleted items. See **Figure 4–10**.

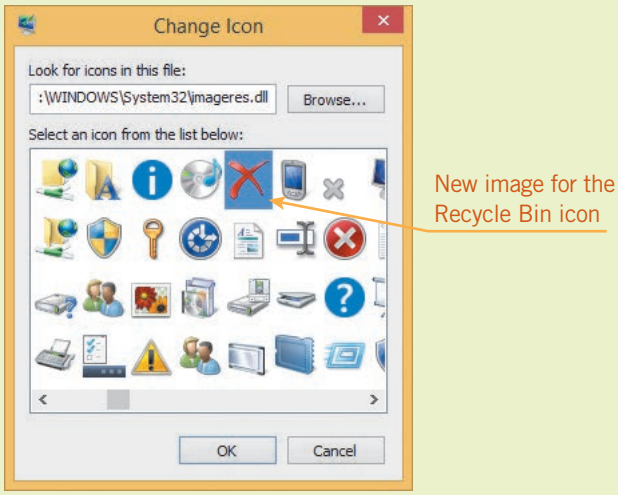


FIGURE 4–10
Change Icon dialog box

3. Click the **OK** button to close the Change Icon dialog box. A preview of the new icon appears in the Desktop Icon Settings dialog box.
4. Click the **OK** button to close the Desktop Icon Settings dialog box, and then minimize the Personalization window. If necessary, drag the File Explorer window so you can see the new Recycle Bin icon on the desktop.
5. In the File Explorer window, navigate to your USB drive, and then display the **Lesson 3** folder.
6. Right-click the **Lesson 3** folder, and then click **Properties** on the shortcut menu to open the Properties dialog box for the folder.
7. Click the **Customize** tab, and then click the **Change Icon** button to open the Change Icon dialog box for the folder. This is the same dialog box you used in Steps 2 and 3, although it displays a different set of icons.
8. Scroll to review the icons, and then click an icon to select it. Click the **OK** button to close the Change Icon dialog box, and then click the **OK** button to close the Properties dialog box for the folder.
9. The folder icon now appears with the image you selected. If necessary, switch to Large icons view to enlarge the icon. See **Figure 4–11**.

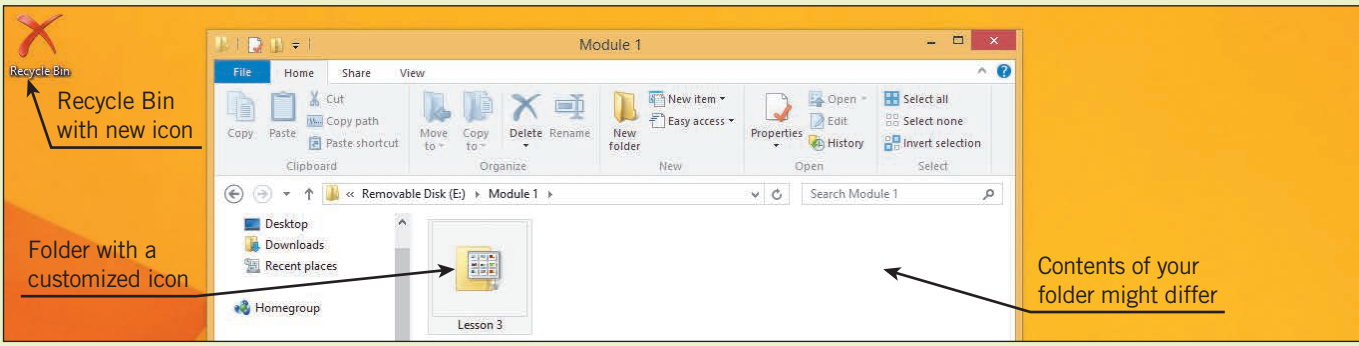


FIGURE 4–11 Changing a folder icon

10. To restore the default image of the Recycle Bin, click the **Control Panel** button on the taskbar to restore the Personalization window, and then click **Change desktop icons** in the left pane to open the Desktop Icon Settings dialog box.
11. Click the icon you customized, click the **Restore Default** button, and then click the **OK** button to close the Desktop Icon Settings dialog box.
12. In the File Explorer window, right-click the **Lesson 3** folder, and then click **Properties** on the shortcut menu to open the Properties dialog box for the folder. Click the **Customize** tab, and then click the **Change Icon** button to open the Change Icon dialog box for the folder.
13. Click the **Restore Defaults** button, and then click the **OK** button to close the Lesson 3 Properties dialog box.

Working with Regional Settings

1-1.3.1

VOCABULARY
system time
localize

The time displayed in the notification area of the taskbar, which is called the ***system time***, should reflect the time zone for your location. Operating systems use the system time to mark when files and folders are created and modified. In Windows, you can change the regional settings and ***localize*** your computer, which means it uses settings appropriate for a particular location.

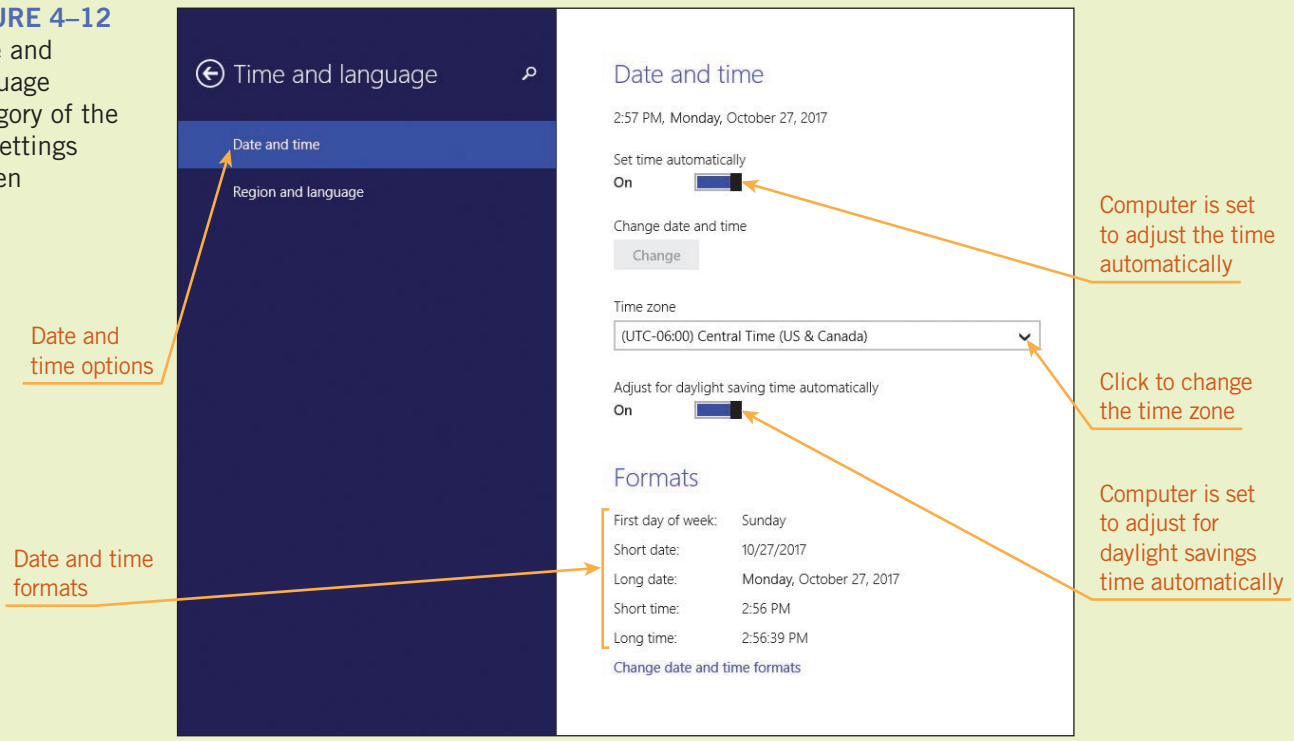
In the Time and language category of the PC settings screen and in the Clock, Language, and Region category of the Control Panel, you can change time zone settings, the date, your location, and the format Windows uses to display dates and times. Some apps, such as Maps and Weather, provide you with local information based on the location you select. You can also change the display language, which is the language that Windows uses in wizards, dialog boxes, menus, Help and Support topics, and other items in the user interface. Windows installs some display languages by default; you might need to install additional files for other languages. The Control Panel includes a few additional settings, which you identify in Step-by-Step 4.5.

In the following steps, you review the options for selecting a time zone, a language, and a region. You start working in the PC settings screen to change the time zone. You also use the Control Panel to review the available date, time, and language settings. Note your original settings so you can restore them at the end of this Step-by-Step. Many computer labs do not allow access to these settings. If you are not allowed to access them, read but do not perform the following steps.

Step-by-Step 4.5

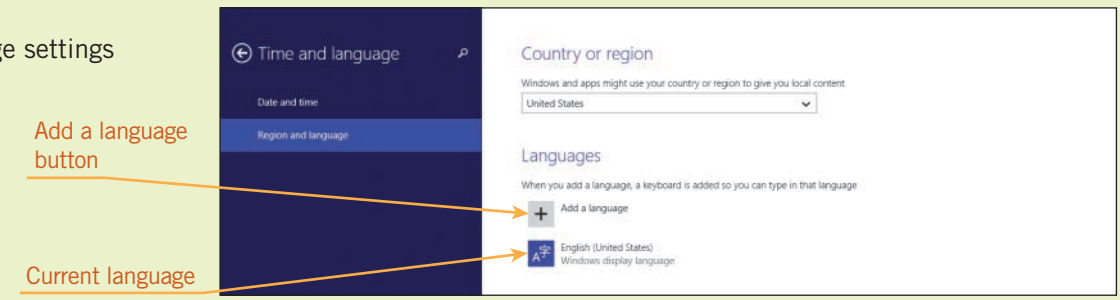
1. Point to the upper-left corner of the screen to display a thumbnail of the PC settings screen, and then click the **thumbnail** to open the PC settings screen.
2. In the left pane, click the **Back** button to display the PC settings categories, and then click **Time and language** to display the Date and time options in the right pane. See **Figure 4–12**.

FIGURE 4–12
Time and language category of the PC settings screen



3. Click the current time zone, and then scroll as necessary to click a different time zone, such as **(UTC-09:00) Alaska**. Next, you can explore the language settings.
4. Click **Region and language** in the left pane to display the region and language settings. See **Figure 4–13**.

FIGURE 4–13
Region and language settings



5. Click the **Add a language** button to display the languages installed on your computer.

6. Point to the upper-left corner of the screen, and then click the **desktop thumbnail**. In the Control Panel window, click **Control Panel Home**, and then click the **Clock, Language, and Region** category to open the Clock, Language, and Region window. See **Figure 4–14**.

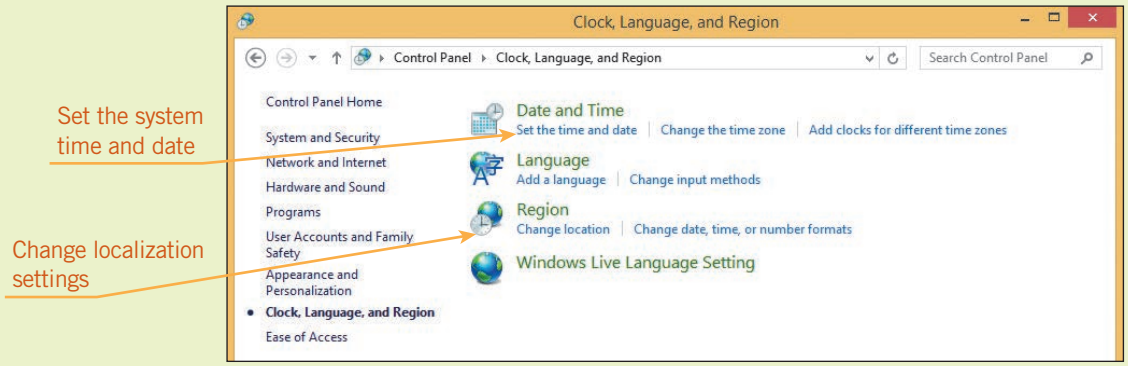


FIGURE 4–14
Clock, Language, and Region window

7. In the Date and Time category, click **Set the time and date** to open the Date and Time dialog box. See **Figure 4–15**. You use this dialog box to change the system date and time, change the time zone, display additional clocks for other time zones, and synchronize the system time with the time maintained on a Web site, such as time.windows.com.

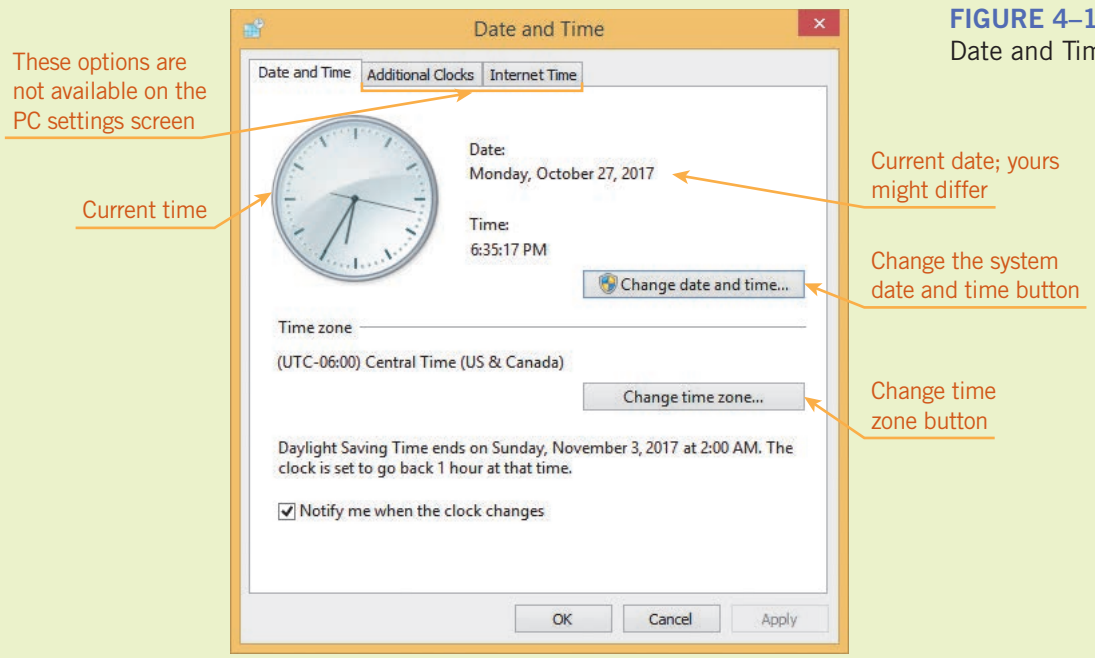
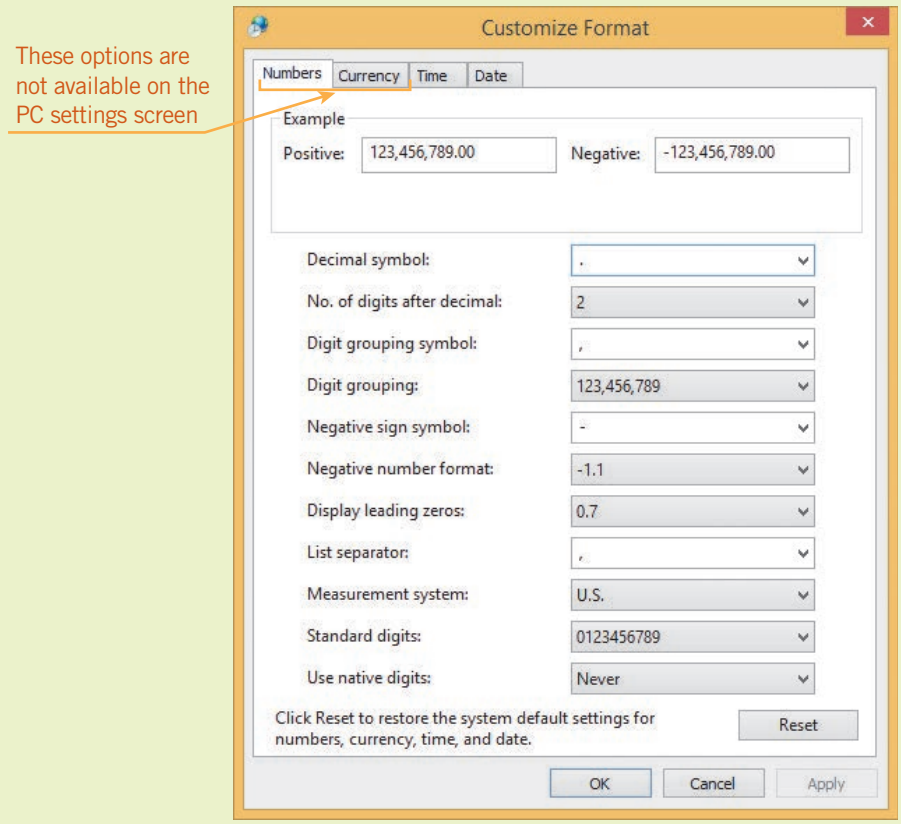


FIGURE 4–15
Date and Time dialog box

8. Click the **Cancel** button to close the Date and Time dialog box.
9. In the Clock, Language, and Region window, click **Region** to open the Region dialog box, which you use to set the format of dates and times and to set your location.

10. On the Formats tab, click the **Additional settings** button to open the Customize Format dialog box, which displays options for customizing the format of numbers, measurements, currency, times, and dates. See **Figure 4–16**.

FIGURE 4–16
Customize Format dialog box



11. Click the **Cancel** button to close the Customize Format dialog box, and then click the **Cancel** button to close the Region dialog box. Now you can restore your original time zone setting on the PC settings screen.
12. Point to the upper-left corner of the screen, and then click the **PC settings screen thumbnail** to open the PC settings screen displaying the Add a language options.
13. Click the **Back** button to display the Region and language settings, click **Date and Time** in the left pane, click the time zone, and then click your original time zone.

Setting Accessibility Options

1-1.3.1

Accessibility refers to features that make a computer easier to use for people who might otherwise have trouble viewing the screen, hearing system sounds, or using a mouse and keyboard. Devices with touchscreens are easier to use for most people because you can interact with them directly by touch, rather than manipulating a mouse or other pointing device. Personal operating systems include accessibility features that can heighten the contrast between colors on the screen, making objects easier to see. Personal and mobile operating systems provide tools that narrate text displayed on the screen and provide text or visual alternatives to sound, such as captions for speech in videos.

VOCABULARY

accessibility

Windows calls its accessibility features Ease of Access options. Although these options are designed for users with special vision, hearing, and mobility needs, any user might find it helpful to adjust Ease of Access settings when performing tasks such as creating illustrations that require more control over mouse and keyboard settings or when working in a poorly lit or noisy room. The Ease of Access category on the PC settings screen includes accessibility features that apply to the Start screen and apps as well as the desktop, including high contrast and Narrator, which reads onscreen text aloud. You use the Ease of Access category in the Control Panel to open the Ease of Access Center, which includes all of the accessibility features in Windows.

In Step-by-Step 4.6, you explore the Ease of Access category in the PC settings screen, and then switch to the desktop to open the Ease of Access Center, which includes the following three sections:

- *Quick access to common tools box*—This section provides tools that make your computer easier to use: Magnifier, Narrator, On-Screen Keyboard, and High Contrast. When you turn on a tool, it stays on until you sign out of Windows or shut down.
- *Get recommendations to make your computer easier to use*—Click this link to display a questionnaire about how you want to use your computer. When you submit the questionnaire, Windows provides a list of settings that can make your computer easier to use. You can then select the settings you want.
- *Explore all settings*—This section lists eight categories of accessibility tools, such as those that make the computer easier to see or use. When you select a tool and set its options, it starts immediately and each time you sign in to Windows.

In the following steps, you explore the options in the Ease of Access category of the PC settings screen, and then change the size and color of the mouse pointer to make it easier to see. Next, you display the Ease of Access Center on the desktop, select the Magnifier in the Quick access to common tools box, and then use the Magnifier to enlarge the area of the screen around the pointer. Some Ease of Access tools require hardware that can adapt to the changes the tools require. For example, to use the Magnifier, your monitor must be able to display magnified parts of the screen. If your computer does not have the required hardware, the tool will not work.

ABOVE AND BEYOND

The accessibility options in Mac OS X and Linux are similar to those in the Windows Ease of Access Center. Mac options include VoiceOver (a screen reader), Zoom (a screen magnifier), and Dictation (a voice-to-text converter). To use these options, click the Apple menu, click System Preferences, and then open the Accessibility tool. In Ubuntu Linux, you open the System menu, click System Settings, and then open the Universal Access tool to use accessibility features such as high-contrast system colors, a screen reader, and voice recognition.

Step-by-Step 4.6

1. Click the **Back** button to display the PC settings screen. Click the **Ease of Access** category in the left pane to display the Ease of Access options in the right pane.
2. Scroll the right pane to display all of the Narrator settings, and then click **Magnifier, High contrast, Keyboard, Mouse**, and **Other options** in the left pane to examine all of the Ease of Access options.
3. Click **Mouse** in the left pane to display the Mouse settings. Click the third setting below Pointer size, and then click the third setting below Pointer color to make the pointer larger and easier to see on the screen. See **Figure 4–17**.

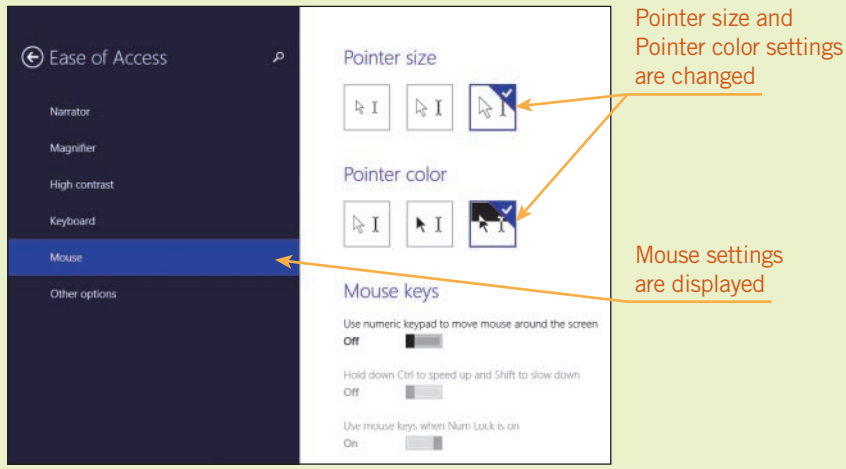


FIGURE 4–17
Changing the mouse settings

4. Point to the upper-left corner of the screen to display a thumbnail of the desktop, and then click the **thumbnail** to display the Clock, Language, and Region window on the desktop.
5. In the left pane, click **Ease of Access** to open the Ease of Access window. Click **Ease of Access Center** to open the Ease of Access Center window. See **Figure 4–18**. A digital voice might explain what you can do with this window as the Narrator tool scans the text. As the Narrator scans, it moves a selection box in the window so you can make a selection.

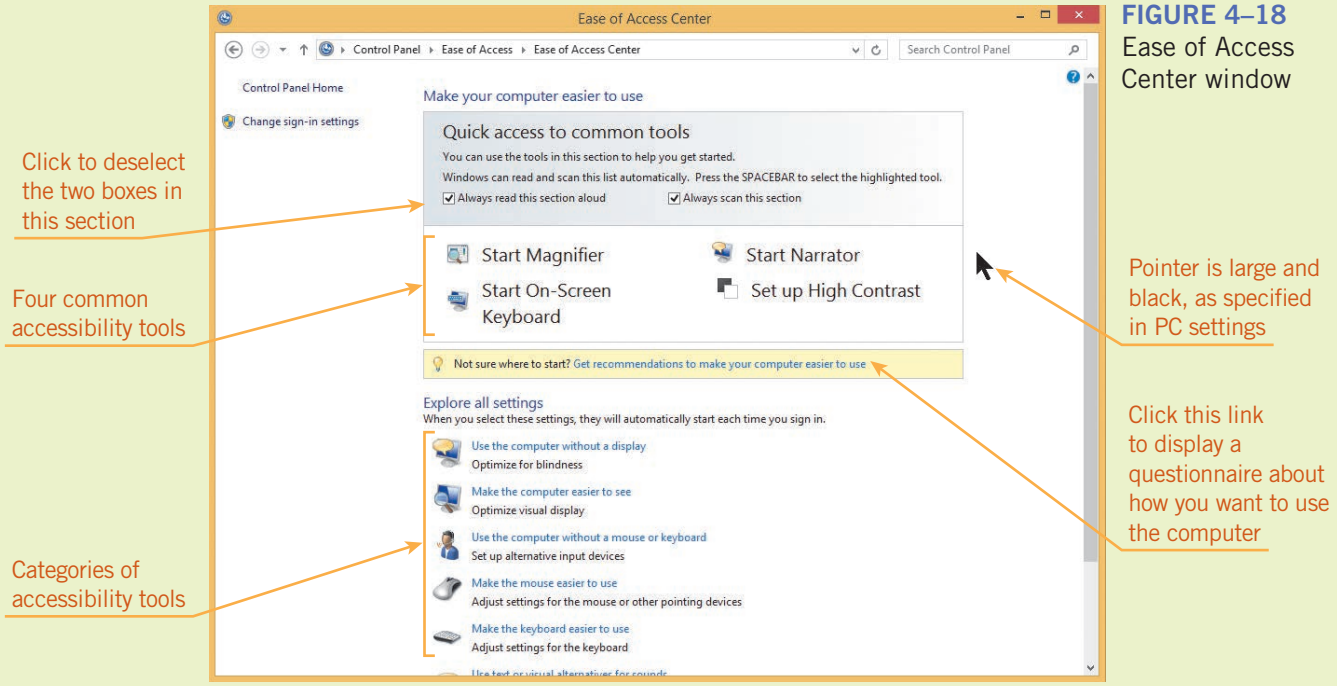


FIGURE 4–18
Ease of Access Center window

6. To turn off the Narrator, if necessary, click the **Always read this section aloud** check box to remove the check mark. Click the **Always scan this section** check box to turn off the selection box, if necessary.
7. In the Quick access to common tools box, click **Start Magnifier**. The Magnifier dialog box opens and the screen is magnified to 200%.
8. When an image of a magnifying glass appears onscreen, move the pointer around the screen to magnify the area under the pointer. See **Figure 4–19**, which shows the Ease of Access Center window magnified.

QUICK TIP

If your monitor cannot magnify the screen, skip Steps 7 and 8.

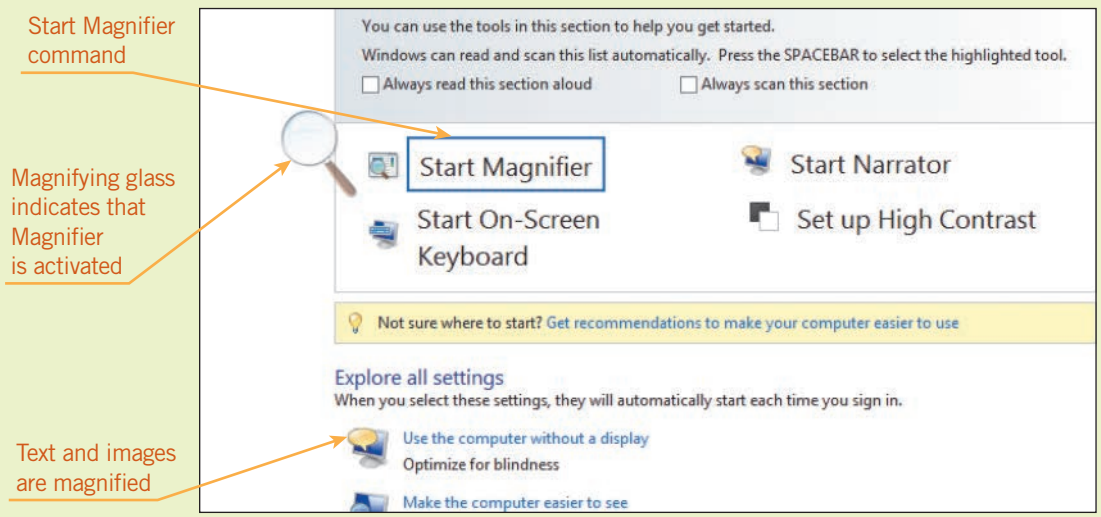


FIGURE 4–19
Magnifier tool

QUICK TIP

If you could not turn off the Magnifier in Step 9, click the magnifying glass, and then click the Close button in the Magnifier dialog box to turn off the Magnifier.

9. Press and hold the **Windows** key, and then press the **Esc** key to turn off the Magnifier.
10. Point to the upper-left corner of the screen to display a thumbnail of the PC settings screen, and then click the **PC settings screen thumbnail** to open the PC settings screen displaying the Ease of Access category.
11. Click the original pointer size and the original pointer color.
12. Click the **Back** button to display the PC settings screen.

IC3
1-1.3.2
1-1.3.3
1-1.3.4
1-1.3.5

Customizing Power Options

Computers consume power when you run them and even when they're idle. You should use only the power your computer needs to complete your current task so you can conserve energy in general. If you use a mobile computer, such as a laptop, tablet, or smartphone, power is a greater concern. Although mobile devices use far less electricity than desktop computers, mobile computers get the power they need from a battery, and you can draw power from the battery only for a limited time before you need to recharge it. For this reason, mobile computers display a battery icon that shows how much charge is left in the battery.

According to energy.gov (a Web site provided as a service by the U.S. Department of Energy), you can save energy by reducing the power consumption of your computer in the following ways:

- Monitors use a significant amount of electricity, so you can save energy by turning off the monitor if you don't plan to use the computer for 15–20 minutes.
- Turn off the CPU by shutting down or using a power-saving feature such as sleep.
- Use the power management features in your operating system to select settings appropriate for how you use the computer.

VOCABULARY
power state
hibernation

You use the power management features in the operating system to change the power state of a computer. A ***power state*** is a set of conditions that determines how much power the computer is using. Common power states range from fully awake (consuming the most power), to sleep or standby, hibernation, and shut down (consuming no power). Windows provides the following power states (Lesson 1 introduced sleep and shut down):

- *Sleep*—In this power state, Windows saves your data and system settings in temporary memory, blanks the screen, and does not perform any activities, which conserves power. When you're ready to use your computer again, Windows quickly wakes up and resumes operations. Because your data is saved in temporary memory, you could lose it if the power fails completely, so it's best to save your work before letting your computer go to sleep.
- *Hibernation*—Ideal for mobile computers, ***hibernation*** saves your work to your hard disk, reduces the power for a specified amount of time, and then turns off your computer. Windows puts a mobile computer into hibernation when the battery charge is critically low.

- *Hybrid sleep*—As an alternative to sleep designed for desktop computers, Windows includes a power state called ***hybrid sleep***, which saves your data on the hard disk (not temporary memory) before putting your computer to sleep. Using hybrid sleep, your computer quickly resumes running and avoids the risk of losing data.
- *Shut down*—This power state turns off the power completely to save wear and tear on your electronic components and conserve energy.

VOCABULARY
hybrid sleep
power plan

Setting Basic Power Options



1-1.3.3

To work with the full set of power options in Windows 8, you open the Power Options window in the Control Panel. You can use the Power Options window to set what Windows does in certain conditions. These basic power options vary depending on whether you are using a desktop or a mobile computer. For example, you can set a mobile computer to hibernate when you press the power button rather than sleep, which is the default. You can set the following basic power options:

- *Require a password on wakeup*—Select this setting if you want to protect your data by requiring users to enter a password when the computer wakes up from sleep.
- *Choose what the power buttons do*—Specify what happens when you press the hardware power button and your computer is running on battery power or is plugged into a power outlet. Options include do nothing, sleep, hibernate, and shut down. If your computer has a sleep button, you can also specify whether the computer does nothing, goes to sleep, or hibernates when you press that button. If your computer does not have a sleep button, this option is called *Choose what the power button does*.
- *Choose what closing the lid does*—Specify what happens when you close the lid on a laptop computer and your computer is running on battery power or is plugged into a power outlet. (This option is not available for desktop computers.) Options include do nothing, sleep, hibernate, and shut down.
- *Create a power plan*— A ***power plan*** is a collection of hardware and system settings that manages how your computer uses and conserves power. If none of the default Windows power plans is right for your needs, select this option to create your own power plan.
- *Choose when to turn off the display*—Specify how long to wait before dimming the display and turning off the display when your computer is running on battery power or is plugged into a power outlet. You can also set the screen brightness to use on battery power and when plugged in, if your monitor supports this feature.
- *Change when the computer sleeps*—Specify how long to wait before letting the computer go to sleep when running on battery power or when plugged into a power outlet.

QUICK TIP

You can also use the Power and sleep options in the PC and devices category of the PC settings screen to set when the screen is turned off and when the computer goes to sleep.

1-1.3.4
1-1.3.5

Selecting Power Plans

You can choose from one of three built-in power plans that let you save energy, maximize system performance, or balance energy conservation with system performance. Some computer manufacturers set up other power plans in addition to or as an alternative to the built-in plans. The three built-in plans are called Balanced, Power saver, and High performance, and are described in **Table 4–3**.

TABLE 4–3 Windows power plans

POWER PLAN	DESCRIPTION
Balanced	Balances energy consumption and system performance by adjusting your computer's processor speed to match your activity
Power saver	Saves power on a mobile computer by reducing system performance and extending battery life
High performance	Provides the highest level of performance on a computer but consumes the most energy

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For each power plan, you can specify how long the computer can be idle before Windows dims the display, turns off the display, and puts the computer to sleep when you are using battery power or a wall outlet. Depending on your monitor, you might also be able to set the intensity of the screen brightness.

In Step-by-Step 4.7, you use the Power Options tool in the Hardware and Sound category of the Control Panel to examine the Windows power plans and display the basic and advanced settings for one of the built-in plans.

Step-by-Step 4.7

1. Point to the upper-left corner of the screen, and then click the **desktop thumbnail** to display the desktop and the Ease of Access Center window.
2. In the left pane of the Ease of Access Center window, click **Control Panel Home** to display the Control Panel Home page, and then click the **Hardware and Sound** category.
3. Click **Power Options** to display the Power Options window. See **Figure 4–20**. Your computer might have different plans set up by the computer manufacturer. Note the plan currently selected, so you can re-select that plan at the end of these steps.

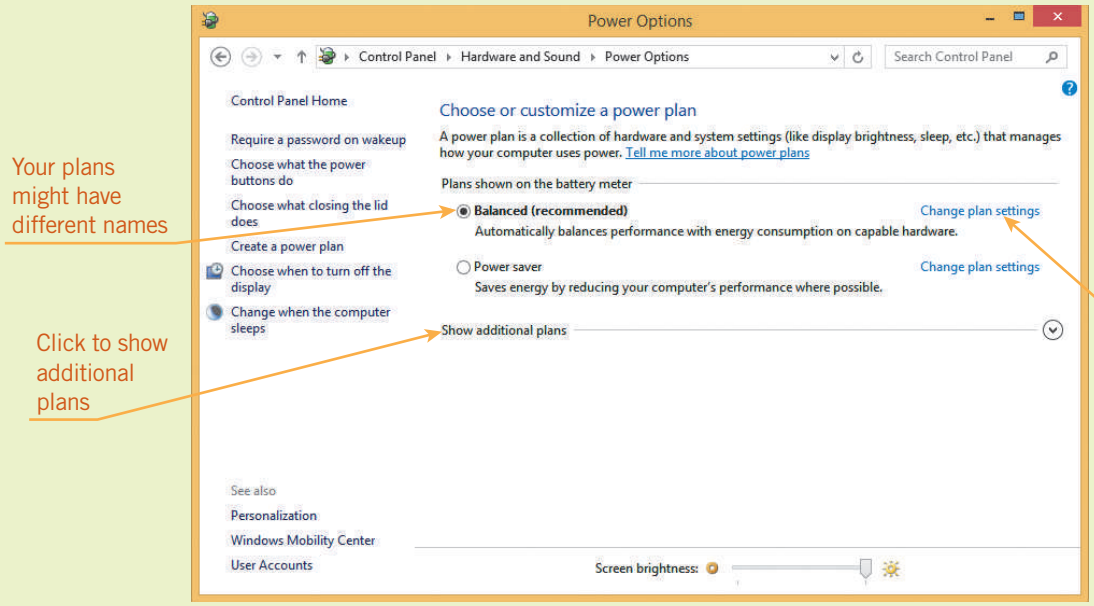


FIGURE 4–20
Power Options window

4. If necessary, click **Show additional plans** to display all the power plans on your computer.
5. Click the **Balanced** option button to select the Balance power plan, if necessary, and then click the **Change plan settings** link for the Balanced plan. **Figure 4–21** shows the basic settings for the Balanced power plan; your settings might differ.

QUICK TIP

If your Balanced power plan has been renamed, click the option button for that plan.

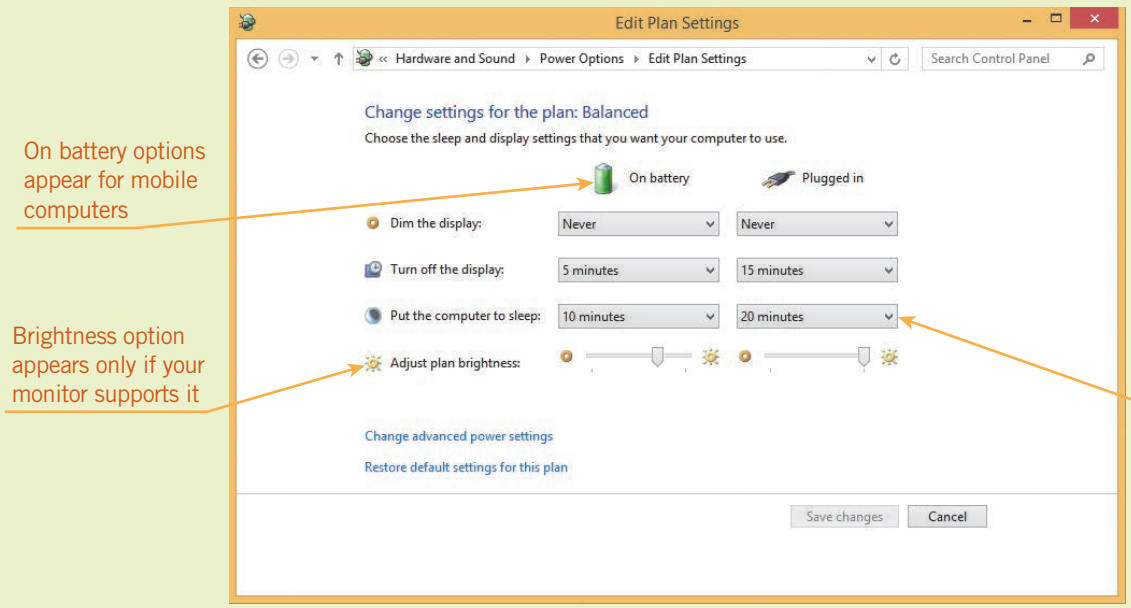


FIGURE 4–21
Edit Plan Settings window

6. In the Edit Plan Settings window for the Balanced plan, click **Change advanced power settings** to open the Power Options dialog box.
7. To display the advanced sleep options, click the **expand** icon ⊞ next to Sleep. See **Figure 4–22**.

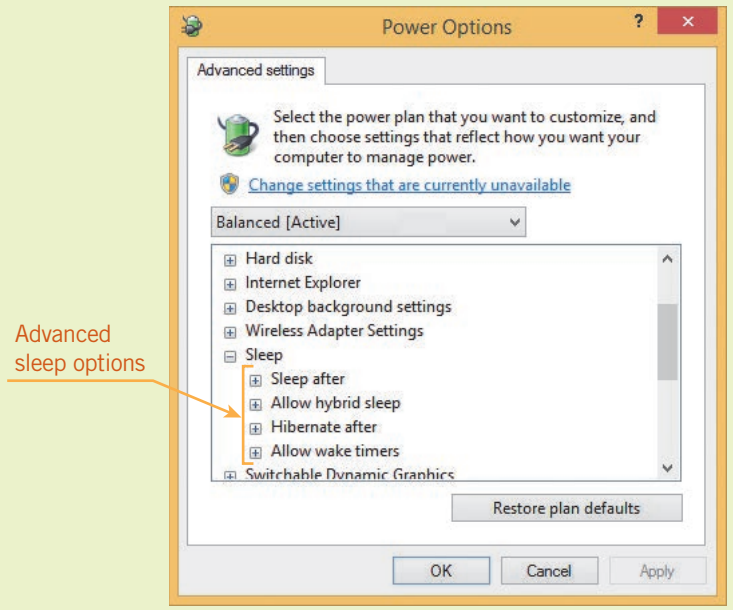


FIGURE 4–22
Advanced sleep options in the Power Options dialog box

8. Click the **Cancel** button to close the Power Options dialog box without making any changes to the advanced settings, and then click the **Cancel** button in the Edit Plan Settings window.
9. In the Power Options window, select your original power plan, and then minimize the window.

This lesson has defined the Windows power states and then reviewed the basic and advanced power options that let you control the power states. **Table 4–4** summarizes when you should use each power state other than fully awake, and reviews how to select them.

TABLE 4–4 When and how to select Windows power states

POWER STATE	WHEN TO USE	HOW TO USE
Sleep	You do not plan to use your computer for several hours.	■ Display the Charms bar, click the Settings charm, click Power, and then click Sleep. ■ Press the hardware power or sleep button, close the lid, or let the computer remain idle as specified in a basic power option.
Hibernate	You are finished working and won't use your computer for up to a day.	■ Change what happens when you press the hardware power button or close the lid to Hibernate, and then press the power button or close the lid.
Hybrid sleep	You are concerned that your computer might lose power while it is asleep.	■ Change the advanced Sleep setting to use hybrid sleep, and then let the computer go to sleep.
Shut down	You are finished working and won't use your computer for at least a day.	■ Display the Charms bar, click the Settings charm, click Power, and then click Shut down. ■ Change what happens when you press the hardware power button to Shut down, and then press the power button.

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Understanding User Accounts

IC3 1-1.3.6

In Windows and other operating systems, a user account is a collection of information that indicates the files and folders you can access, the types of changes you can make to the computer, and your preferred appearance settings (such as your desktop theme and Start screen background). If you have a user account on a computer that you share with other people, you can maintain your own files and settings separate from the other users.

You can create two types of accounts in Windows 8:

VOCABULARY
Microsoft account
cloud computing
local-only user account
Standard account

- *Microsoft account*—With a ***Microsoft account***, you can access resources on your computer and Microsoft ***cloud computing*** services, which are services stored online, similar to Web applications. With a Microsoft account, you can store files and folders on your SkyDrive. The advantage of a Microsoft account is that you provide one user name and one password to sign into your computer and to connect to your cloud computing services.
- *Local-only user account*—With a ***local-only user account***, you can access only resources on your computer.

In addition, a Microsoft account or a local-only user account is a Standard account or an Administrator account, which determines how much control the user has over the computer:

- *Standard*—A ***Standard account*** is designed for everyday computing and can protect your computer and data by preventing users from changing settings that affect all users. You can access the files and folders in your account, but not the files and folders of other users. To make changes such as installing software or changing system settings, Windows requests permission or a password for an Administrator account. Microsoft recommends that every regular user on a computer have a Standard account.

VOCABULARY

Administrator account

user credentials

password

- *Administrator*—An ***Administrator account*** is created when Windows 8 is installed and provides full access to the computer. The Administrator account can access the files of any user, install and uninstall software, and change any settings.

If someone needs temporary access to a computer, the Administrator can turn on the Guest account, which is a built-in account that is inactive by default. The Guest account user cannot make any changes to settings or software.

When you install Windows 8, the setup program guides you through the steps of creating an Administrator account. During that process, you select whether you want to use your Microsoft account or a local-only user account as the Administrator account. If you don't have a Microsoft account, you can create one as you install Windows. After completing the installation, you can set up a Standard account for yourself and one for each person who will use the computer. Any accounts you create after the initial Administrator account are Standard accounts by default. Standard accounts can be Microsoft or local-only user accounts.

Setting Up a New User Account

ABOVE AND BEYOND

For any Windows account with a text password, you can also set up a personal information number (PIN) and a picture password. A PIN is a four-digit number you can use as a fast way to sign in to Windows. Picture passwords are designed for users of touchscreen devices. On a photo on your computer, you draw three shapes that Windows remembers and requires you to repeat to access your account.

When you create an Administrator account or a Standard account in Windows, you must provide your ***user credentials***, which consist of at least a username and an optional password. A ***password*** is a series of letters, numbers, spaces, and symbols that you provide to access your files, applications, and other resources on the computer. Windows passwords are case sensitive, so ALincoln212 is different from alincoln212. If you have a Microsoft account, you can provide the username and password you use for that account. If you don't have a Microsoft account, you can create one as you set up a new Administrator or Standard account. To use a Microsoft account, you provide your e-mail address and a password as your user credentials.

If you set up a new Administrator or Standard account as a local-only user account, you must provide a username, but the password is optional. However, Microsoft strongly recommends that you use a password for all accounts, which is one of the most effective ways you can keep your computer and the information stored on it secure. When your computer is protected with a password, only someone who knows the password can sign in to Windows. Therefore, you should not give your password to others or write it in a place where others can see it.

In Step-by-Step 4.8, you create a text document in the Documents folder, and then set up a new user account as a Standard, local-user only account. You do so using the Users category on the PC settings screen. You must sign in to Windows using an Administrator account to add users to the computer. If you are not allowed to sign in using an Administrator account, read but do not perform the following steps.

Step-by-Step 4.8

1. Open File Explorer, and then navigate to the **Documents** folder. Right-click a blank area in the right pane of File Explorer, point to *New* on the shortcut menu, and then click **Text Document** to create a new text document. Type **Account Test** as the name of the new document and then press the **Enter** key.
2. Right-click **Account Test**, point to *Open with* on the shortcut menu, and then click **Notepad** to open the document in Notepad. Type **This is a text document created in my original user account.** Save and close the file.

3. Point to the upper-left corner of the screen to display a thumbnail of the PC settings screen, and then click the **thumbnail** to open the PC settings screen.
4. Click the **Accounts** category in the left pane to display a screen with your account information.
5. Click **Other accounts** in the left pane, and then click the **Add an account** button in the right pane to display a screen for adding a user. See **Figure 4–23**.

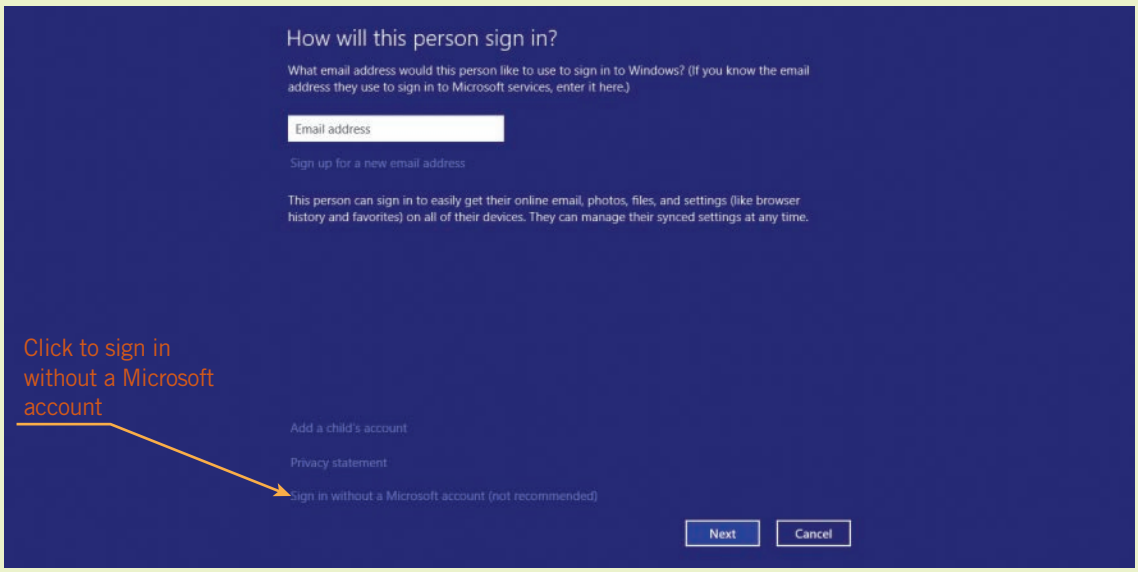


FIGURE 4–23
Adding a user

6. Click **Sign in without a Microsoft account (not recommended)** to display a screen that describes the two types of accounts you can use.
7. Click the **Local account** button to display a screen where you enter your username and password.
8. Enter a username, which can be your full name including spaces. Enter and reenter a password, and then enter a password hint, which is a question or note that reminds you about your password. For example, if your password is MarmaDuke04, your password hint might be "First dog."
9. Click the **Next** button to display a screen that confirms your selections, and then click the **Finish** button to finish creating the account.

After creating the new Standard account, you switch to it in Step-by-Step 4.9 so you can see whether it can access the text document you created. If you could not create a Standard account in Step-by-Step 4.8, read but do not perform the following steps.

Step-by-Step 4.9

1. To switch to the new Standard account you just created, point to the lower-left corner of the screen, click the **Start** button to display to the Start screen, click the user icon in the upper-right corner of the screen, and then click the username for the new Standard account. Windows signs out of your account and displays a screen where you can enter your password.
2. Type the password for the account in the text box that appears under the account's user name, and then press the **Enter** key. Windows takes a few moments to set up the account, and then displays the Start screen for the new account. The Start screen settings in the new account use the Windows default settings for the background and color scheme.
3. Click the **Desktop** tile to display the desktop, and then click the **File Explorer** button on the taskbar to open File Explorer.
4. Navigate to the **Documents** folder to display its contents in the right pane. The Account Test document you created does not appear in the Documents folder because this new user account is a Standard account, which means it cannot access files created in another user account.

Rights and Permissions

Microsoft recommends that you use a Standard account for your normal computing tasks and the Administrator account only for installing and uninstalling software, changing system settings, and any activity that affects other users on the computer. It does so because the Administrator account can access settings that change the way Windows works. If the person using the Administrator account is careless or malicious, Windows can become corrupted or difficult to use.

One tool that Windows provides for expert users is called the Local Group Policy Editor. ***Group policies*** are settings that affect how Windows works and what rights and permissions user accounts have. In this context, a ***right*** is something a user account is allowed to do. For example, the Administrator account has full rights to install software. A ***permission*** allows a user account to access a file, folder, or other object. In Step-by-Step 4.9, you could not access the Account Test document from the newly created Standard user account because that account did not have permission to access it. By using group policies, the Administrator account can set rights and permissions for other user accounts, especially to restrict access to certain locations, such as folders containing system files.

If more than one person uses your computer, you can also set permissions so you can share files with other users. These sharing permissions determine who can change your files and what kinds of changes they can make. In this way, you can allow only some users on your computer to view, change, or create files in your folders. You can set two types of permissions: Read permission allows another user to only read the files in the shared folder, while Read/Write permission allows another user to read, change, add, or delete any file in the shared folder.

In Step-by-Step 4.10, you explore how to share the Documents folder for your account with other users. Most likely, you are not allowed to set sharing permissions in a computer lab, but you can examine the settings and dialog box you use to do so.

VOCABULARY

group policy

right

permission

ABOVE AND BEYOND

On mobile computers used in business, the Administrator account often sets group policies that ensure the power management options are adhered to, for example, to conserve battery power, and that security settings are used, such as requiring a password after sleep, to protect the computer and its data from unauthorized access.

Step-by-Step 4.10

1. In File Explorer, navigate to and then click the **Documents** folder, if necessary.
2. Click the **Share** tab on the Ribbon to display the Share options. See **Figure 4–24**. If users are listed in the Share with group, you could select a user with whom you want to share files stored in the Documents folder.

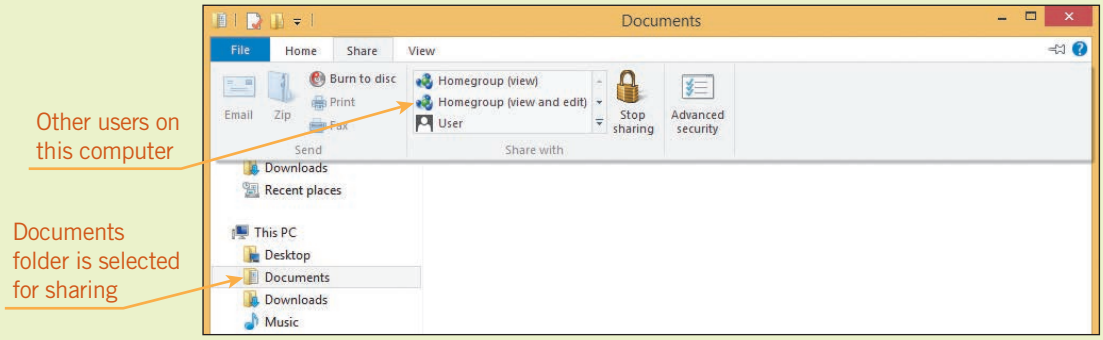


FIGURE 4–24
Share tab in File Explorer

3. In the Share with group, click the **More** button, if necessary, and then click **Specific people** to open the File Sharing window. This window lists users that have permission to share files with the current account. (Your window might not list any users.)
4. To add a user who can share files with the current account, click the **arrow** button to display a list of people and groups. **Figure 4–25** lists four users, but your window might list only one. In that case, read but do not perform Steps 5 and 6.

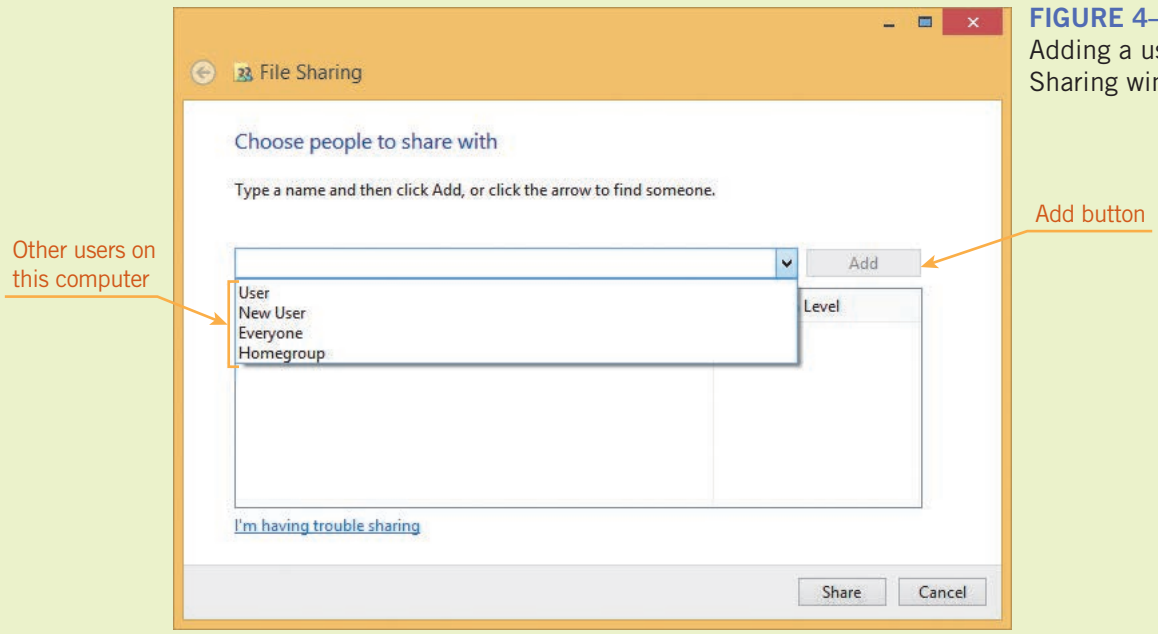


FIGURE 4–25
Adding a user in the File Sharing window

5. Click a user, and then click the **Add** button to add the user to the list. By default, the new user is assigned the Read permission.
6. To change the permission level, click the **Read** button for the user you added, and then click **Read/Write**.
7. Click the **Cancel** button to close the File Sharing window without saving your changes. If you wanted to save the changes and share the Documents folder with another user, you would click the Share button instead of the Cancel button.

Deleting User Accounts

If an account is no longer being used on a computer, the Administrator account can delete it. If you are using an Administrator account, take care before deleting other user accounts. Doing so deletes all of the settings and files associated with the account. You can use the Accounts category on the PC settings screen or the User Accounts and Family Safety category in the Control Panel to delete an account.

In Step-by-Step 4.11, you use the PC settings screen to delete the user account you created in Step-by-Step 4.8. First, you must sign out of the new account and switch to your original one. You must sign in to Windows using an Administrator account to delete a user account. If you are not allowed to sign in using an Administrator account, read but do not perform the following steps.

Step-by-Step 4.11

QUICK TIP

You must sign out of your new account so you can delete it later. Windows cannot delete an active account.

1. Click the **Start** button to display the Start screen. Click the user icon and then click **Sign out**. Windows signs out of your new account and displays the lock screen or the screen where you enter your password.
2. If necessary, press the **Enter** key to close the lock screen, click the icon for your original account, enter the password for the account, and then press the **Enter** key.
3. Point to the upper-left corner of the screen, and then click the **thumbnail** to display the PC settings screen, which should display the Other accounts options in the Accounts category.

4. Click the Standard account you created in Step-by-Step 4.8. See **Figure 4–26**.

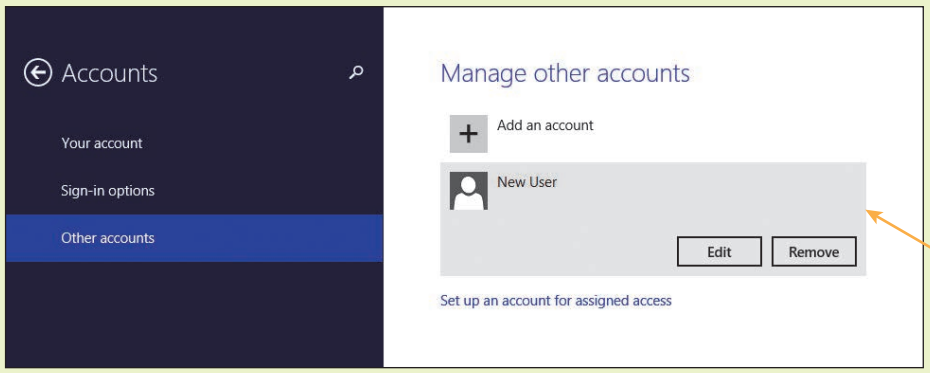


FIGURE 4–26
Manage other accounts screen

5. Click the **Remove** button. Windows asks whether you want to delete the account and its data.
6. Click the **Delete account and data** button.
7. Point to the upper-left corner of the screen, and then click the **desktop thumbnail** to return to the desktop.
8. In File Explorer, navigate to the Documents folder, if necessary, click the **Account Test** file, press the **Delete** key, and then click the **Yes** button, if necessary, to confirm you want to delete the file.
9. Point to the upper-left corner of the screen to display a thumbnail of the PC settings screen, right-click the **thumbnail**, and then click **Close** on the shortcut menu to close the PC settings screen.

TECHNOLOGY CAREERS

Network and System Administrators

Just as you use an Administrator account to manage access to a single computer, a network uses administrators to manage access to networks. In addition, network or systems administrators are responsible for running an organization's network from day to day. They also install hardware and software and manage security so that the network and its computers run smoothly.

Part of a network or system administrator's responsibilities include managing an organization's servers. The administrators customize the server operating system to set up and oversee user accounts and work with group policies to set rights and permissions. If you enjoy behind-the-scenes work with operating systems and hardware, you might consider a career as a network or systems administrator. Most administrators work for organizations outside of the technology field, including those in the health care, education, finance, and manufacturing industries.

Most organizations require at least a bachelor's degree in a field related to computer science or information technology. Because administrators work with computer hardware and equipment, many organizations look for candidates with a degree in computer engineering or electrical engineering. An ideal educational program includes classes in computer programming, networking, and systems design.



SUMMARY

In this lesson, you learned:

- The Personalization menu lists options for changing the background design and the colors used on the Start screen, while the PC settings screen includes preferences for using the Start screen environment and Windows 8 apps.
- Use the Personalization Control Panel tool to customize the appearance of the desktop. Most of the other Control Panel tools affect the entire system. All of the Control Panel tools provide access to dialog boxes that let you select or change the properties of an object.
- Many Control Panel categories are similar to the ones on the PC settings screen. If an option affects only the Start screen or Windows apps, it appears on the PC settings screen. If an option affects only the desktop, it appears in the Control Panel. Some options that affect both the Start screen and the Control Panel environments appear in both the PC settings screen and the Control Panel.
- When you personalize the desktop by selecting a theme, you are customizing four elements: the desktop background image; the color for window borders and the taskbar; the collection of sounds that play to signal system tasks; and the screen saver.
- Use the Change Icon dialog box to change the appearance of the desktop icons and folder icons.
- Use the tools in the Time and language category of the PC settings screen and the Clock, Language, and Region category of the Control Panel to localize your computer so it uses settings appropriate for a particular location. You can set your location, change the date and time, and select the format Windows uses to display dates and times.
- Accessibility refers to features that make a computer easier to use for people who might have trouble viewing the screen, hearing system sounds, or using a mouse and keyboard. Windows calls its accessibility features Ease of Access options, and makes these features available on the PC settings screen and in the Control Panel.
- Use the power management features in an operating system to change the power state of a computer, which is a set of conditions that determines how much power the computer is using. Common power states range from fully awake (consuming the most power), to sleep or standby, hibernation, and shut down (consuming no power).
- Windows includes an alternative to sleep called hybrid sleep, which saves your data on the hard disk before putting your computer to sleep. Standard sleep saves your data in temporary memory, which is not retained when your computer loses power.
- You can use the Power Options window to set what Windows does in certain conditions, such as having a mobile computer hibernate when you press the power button rather than sleep. These basic power options are listed in the left pane of the Power Options window and vary depending on whether you are using a desktop or a mobile computer.
- A power plan is a collection of hardware and system settings that manages how your computer uses and conserves power. You can choose from one of three built-in plans that let you save energy, maximize system performance, or balance energy conservation with system performance.
- You can select advanced settings for a particular power plan that apply when your computer is running on battery power and when your computer is plugged into a power outlet. These advanced settings are available in the Power Options dialog box, which you open from the Edit Plan Settings window. For example, you can specify that you want to use hybrid sleep instead of standard sleep.
- In Windows and other operating systems, a user account is a collection of information that indicates the files and folders you can access, the types of changes you can make to the computer, and your preferred appearance settings. If you have a user account on a computer that you share with other people, you can maintain your own files and settings separate from the other users.
- In Windows 8, you can set up a local-only user account or a Microsoft account, which can access Microsoft cloud computing services such as SkyDrive. In addition, a Microsoft account or a local-only user account is a Standard account or an Administrator account, which determines how much control the user has over the computer.
- Only the Administrator account can install and uninstall software, change system settings, and perform tasks that affect other users on the computer.
- When you create an account in Windows, you must provide your user credentials, which consist of at least a username and an optional password. A password is a series of letters, numbers, spaces, and symbols that you provide to access your files, applications, and other resources on the computer.
- Every user account has certain rights and permissions. A right is something a user account is allowed to do. For example, the Administrator account has full rights to install software. A permission allows a user account to access a file, folder, or other object.
- If more than one person uses your computer, you can set permissions to share files with other users. These sharing permissions determine who can change your files and what kinds of changes they can make. In this way, you can allow only some users on your computer to view, change, or create files in your folders.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. Windows themes come as a package of appearance options that you cannot customize.

T F 2. The Narrator is an accessibility tool that narrates text displayed on the screen.

T F 3. A computer's power state is reflected in an icon that shows how much charge is left in the battery.

T F 4. Using a Standard account, you can access the files and folders of all the users on the computer.

T F 5. You can use the Personalization menu to change the background and accent colors of the Start screen background.

MULTIPLE CHOICE

Select the best response for the following statements.

1. The _____ is displayed in the notification area of the taskbar and usually reflects the time zone of your current location.
   A. notification time
   B. Administrator time
   C. system time
   D. Windows time
2. _____ is a power state that saves your work to your hard disk, reduces the power for a specified amount of time, and then turns off your computer.
   A. Hibernation
   B. Sleep
   C. Shut down
   D. Low power
3. On the PC settings screen, you use the _____ category to add a new account.
   A. Accounts
   B. PC and devices
   C. Ease of Access
   D. Privacy
4. _____ permission allows another user to read, change, add, or delete any file in a shared folder.
   A. Read
   B. Change
   C. Read/Write
   D. Super
5. A(n) _____ is a collection of hardware and system settings that manages how your computer uses and conserves power.
   A. basic power option
   B. power plan
   C. advanced power option
   D. power profile

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. If you are using an Administrator account, why should you take care before deleting another user account?

2. What types of settings can you customize using the PC settings screen?

3. Why might you want to change the appearance of a desktop icon?

4. What are the three built-in power plans in Windows and what are they designed to do?

5. When would you need to change the settings in the Clock, Language, and Region category of the Control Panel?

6. How does Microsoft recommend you use Administrator and Standard accounts?

7. What types of tasks can the user of an Administrator account perform that users of Standard accounts cannot perform?

8. When would you select the basic power option that requires a password on wakeup?

9. How is hybrid sleep different from sleep?

10. When might users want to turn on an Ease of Access setting?

PROJECTS

PROJECT 4–1



1-1.3.1

In this project, you customize the Start screen and the desktop, and take screenshots as you make changes. Note your original settings so you can restore them at the end of the project. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. Open the Personalize menu, and then customize the Start screen using a background design and color scheme of your choice.
2. With the Personalize menu displayed, press the **Print Screen** key to capture an image of the customized Start screen. (The Print Screen key on your keyboard might be labeled Prt Scr or something similar.) Save the image as a Paint file named **Start Screen**.
3. Change the desktop theme to a Windows theme of your choice (other than the default theme).
4. On the desktop, change the Recycle Bin icon to display an image of your choice.
5. Open the Date and Time dialog box to show the current date and time.
6. Press the **Print Screen** key to capture an image of the customized desktop and the Date and Time dialog box. Save the image as a Paint file named **Desktop Time**.
7. Close the Date and Time dialog box. Display the PC settings screen, select the **Ease of Access** category, and then select the **High contrast** option.
8. Click the **Choose a theme** button, click **High Contrast #1**, and then click the **Apply** button.
9. When the PC settings screen is displayed in high contrast, press the **Print Screen** key to capture an image of the PC settings screen. Save the image as a Paint file named **Ease of Access**.
10. Restore your settings by selecting **None** as the high contrast theme and then clicking the **Apply** button. Use the Personalize menu to select the original design and color scheme for the Start screen background.
11. Use the Control Panel to restore your original theme and the original Recycle Bin icon.
12. Close all open windows.

PROJECT 4–2

1-1.3.2
1-1.3.3
1-1.3.5

In this project, you change the settings for a power plan on your computer and take screenshots as you make changes. Note your original settings so you can restore them at the end of the project. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests. Some of the following steps require you to perform new tasks or solve problems independently.

1. Display the tools in the Hardware and Sound category of the Control Panel, and then click **Power Options** to display the Power Options window.
2. Change the plan settings for the selected plan so that the display dims after 5 minutes of idle time when running on battery power, and after 15 minutes when plugged in. If you cannot set options for battery power, set only the plugged in option.
3. If possible, adjust the plan brightness so the screen uses about 75 percent of its potential brightness when plugged in.
4. Press the **Alt+Print Screen** keys to capture an image of the Edit Plan Settings window. Save the image as a Paint file named **Power Plan**.
5. Click the **Cancel** button to close the Edit Plan Settings window without saving changes.
6. In the left pane of the Power Options window, click **Choose what the power buttons do**. (If your computer doesn't have a sleep button, this option might appear as "Choose what the power button does.")
7. Click the **Change settings that are currently unavailable** link to activate all the settings in the System Settings window.
8. Change settings so that when you press the hardware power button on any type of power, the computer hibernates.
9. In the Shutdown settings section, click the **Hibernate** check box, if necessary, to set Windows to display the Hibernate command on the Power menu.
10. Press the **Alt+Print Screen** keys to capture an image of the System Settings window. Save the image as a Paint file named **Hibernate**. Resize the window as necessary to display the Hibernate check box.
11. Click the **Cancel** button to close the System Settings window without saving changes, and then close all open windows.

PROJECT 4–3

1-1.3.6

In this project, you use the Accounts category on the PC settings screen to set a PIN and a picture password for your user account. You take screenshots to document your changes. Submit the screenshots as your instructor requests.

1. Open the PC settings screen, and then click the **Accounts** category in the left pane to display a screen with your account information. Click **Sign-in options** in the left pane.
2. If you do not have a text password, click the **Add** button in the Password area. Enter a password, reenter it, and then enter a password hint. Click the **Next** button, and then click the **Finish** button. If you have a text password, skip this step.
3. On the PC settings screen, click the **Add** button in the PIN area, enter your password, and then click the **OK** button.
4. In the Enter PIN text box, enter a four-digit PIN, and then enter the PIN again in the Confirm PIN text box.
5. With your new PIN displayed on the screen, press the **Print Screen** key to capture an image of the Create a PIN screen. Save the image as a Paint file named **PIN**.
6. Click the **Cancel** button to close the Create a PIN screen without saving changes.
7. Display the Start screen, and then press the **Print Screen** key to capture an image of the Start screen. Save the image in the Pictures folder as a Paint file that uses your first name as the filename.
8. Return to the PC settings screen, and then click **Sign-in options** in the Accounts category to display the sign-in options again, if necessary.
9. Click the **Add** button in the Picture password area, enter your password, and then click the **OK** button.
10. Click the **Choose picture** button, click the screenshot you saved in the Pictures folder, and then click the **Open** button to select the picture.
11. Click the **Use this picture** button, follow the directions on the left side of the screen to draw three shapes, and then confirm them.
12. Before clicking the Finish button, press the **Print Screen** key to capture an image of the Congratulations! screen. Save the image as a Paint file named **Picture Password**.
13. Click the **Finish** button to close the Create a picture password screen, and then click the **Remove** button on the PC settings screen to delete the picture password.
14. Click the **Change** button in the Password area, confirm your current password, and then restore your original password.
15. Display the File Explorer window on the desktop, display the Pictures folder, and then delete the Paint file you saved there that uses your first name as the filename.

TEAMWORK PROJECT

You are working at a small Web design company that uses Windows 8 computers. The owner of the company wants to know more about the security and network tools provided in the Control Panel. Work as a team of two to complete the following steps:

1. Assign the System and Security category of the Control Panel to one member of the team, and assign the Network and Internet category to the other member.
2. Review the tools in your assigned category, focusing on security tools or network tools as appropriate.
3. Create a table that includes three columns: the first listing your assigned category, the second listing the name of the Control Panel tool, and the third describing the tool.
4. Combine your table with your partner's table to create one table. Submit the table as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 4–1

User Account Control (UAC) is a Windows feature that displays dialog boxes requesting your permission or an Administrator password before you perform a task that can affect the entire computer, such as installing or uninstalling software. To complete the task, you must allow the change or enter an Administrator password. Some users find these dialog boxes intrusive and turn off UAC, though Microsoft recommends that you leave UAC on to keep your computer secure. Use Windows Help and Support and online sources to answer the following questions.

1. What are the advantages of User Account Control?
2. What are the disadvantages?
3. Submit the answers as your instructor requests.

CRITICAL THINKING 4–2



1-1.3.1

In this exercise, you explore Ease of Access tools you did not explore earlier in this lesson.

1. Open the Ease of Access Center in the Control Panel and then click links and experiment with the accessibility tools to learn more about the following accessibility features:
   - On-Screen Keyboard
   - Speech Recognition
   - Visual Notifications
   - Sticky Keys
   - Mouse Keys
2. Write a brief description of each feature and then submit the description as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 4–1



1-1.3.1

You can customize Windows in more ways than those discussed in this lesson. Complete the following steps.

1. Visit the Microsoft Windows 8 Web page at http://windows.microsoft.com/en-us/windows/home.
2. Use the Search tools provided on the Web site to find information about customizing Windows 8.
3. List at least three ways to customize Windows 8 that have not been discussed in this lesson, and then describe each method.
4. Submit the written answers as your instructor requests.

ONLINE DISCOVERY 4–2



1-1.3.1

As mentioned in this lesson, Mac OS X has accessibility tools similar to those in Windows. Research the following accessibility tools for the Mac and briefly describe each one. Explain how the tool improves access for users. Submit the written answers as your instructor requests.

1. FaceTime
2. ScreenFlash
3. Speakable Items
4. Simple Finder

JOB SKILLS

In Lessons 1–4, you learned a lot about the current operating systems, especially Windows. Technology changes quickly, and you need to be prepared for upcoming trends in technology. Learn about current trends in technology careers by doing some online research. Complete the following steps.

1. Visit at least three Web sites to research trends in technology careers for the current year.
2. List the top three trends in technology jobs today, and briefly describe each trend in a presentation or report.
3. Submit the presentation or report as your instructor requests.

EXPLORE AND SOLVE

Did you know?

- You can enlarge some or all the text and objects on your screen.
- You can increase your work space by projecting to a second screen.

1. Open the Control Panel, click the **Appearance and Personalization** category, and then click **Display** to open the Display window. Note the current settings in this window so you can restore them.
2. To enlarge the text displayed on window title bars, click the first button in the Change only the text size section, and then click **Title bars**, if necessary. Click the second button in that section, and then click **14**. Click the **Bold** check box to display title bar text in a 14-point bold font.
3. Click the **Apply** button to apply the Display settings.
4. Press the **Alt+Print Screen** keys to take a screenshot of the Display window, and then save the image as a Paint file named **Display**.
5. Restore the original settings in the Display window.
6. In the left pane of the Display window, click **Project to a second screen**. A panel opens to show you the options for using a second screen.
7. Press the **Print Screen** key to take a screenshot of the Second screen pane and the desktop, and then save the image as a Paint file named **Second Screen**.
8. Submit the screenshots as your instructor requests.



1-1.3.1



Estimated Time:
2 hours

LESSON 5

Computer Hardware

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe how a computer represents data.
- Identify system components for input and output.
- Define input devices and explain how to use them.
- Define output devices and explain how to use them.
- Identify types of storage devices and media.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

access time
aspect ratio
binary
biometrics
bit
bus
data transfer rate
direct-access storage
ergonomic
expansion card
FireWire (IEEE 1394)
hard drive
liquid crystal display (LCD)
optical storage device
pixel
port
RFID reader
screen resolution
solid-state drive (SSD)
storage device
storage media
Universal Serial Bus (USB)

Microsoft product screenshots used with permission from Microsoft Corporation.

This lesson discusses the computer hardware you need to enter, display, and save data. Because the purpose of this hardware is to transfer or store data, you begin by learning how a computer represents data. Next, you learn to identify the components inside the computer case designed for input and output, and then explore the peripheral devices that can connect to these components. Finally, you will compare types of devices and media for storing data.

1-2.1.2

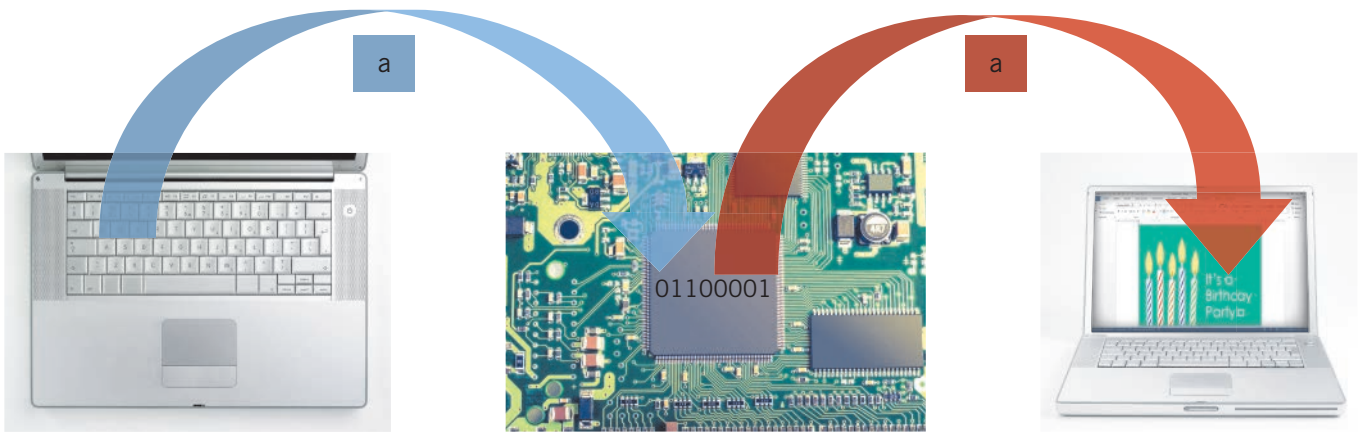
Understanding How a Computer Represents Data

VOCABULARY
binary
bit

Modern computers perform an incredible array of complex tasks, including controlling satellites that monitor the weather, rendering 3D special effects in blockbuster movies, and putting you in touch instantly with people around the world. At their most fundamental level, however, computers are ***binary*** machines, meaning they understand only two states—on and off, represented by 0 and 1, reflecting whether a circuit is receiving electricity (on or 1) or is not receiving electricity (off or 0).

Each of these digits is called a ***bit***, short for *binary digit*, which is the smallest unit of data a computer can process. Eight bits grouped together are called a byte, which is roughly equivalent to one character.

When you press a key on a computer keyboard, you are actually sending an electronic signal to the circuitry in the computer. The circuitry converts the signal into binary form and stores it as a byte in memory for processing. For example, if you press the lowercase "a" key, the computer stores the binary code 01100001 in memory. When the CPU processes that byte of data, it converts it to the letter "a" so it can be displayed on a screen in a form users understand. See **Figure 5–1**.



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FIGURE 5–1 Processing a byte of data

Naturally, computer users work with much more than a byte of data at a time. Terms for measuring data combine "byte" with a meaningful prefix. For example, "giga" means "billion," so the term "gigabyte" means one billion bytes, which is equivalent to about 450 digital songs. **Table 5–1** lists common terms for measuring data.

TABLE 5–1 Data measurement terms

TERM	NUMBER OF BYTES	EXAMPLE EQUIVALENT
Kilobyte (KB)	1,024 (about 1,000)	250-word poem
Megabyte (MB)	1,048,576 (about 1 million)	4 books of 200 pages each
Gigabyte (GB)	1,073,741,824 (about 1 billion)	341 digital photos of 3 MB each
Terabyte (TB)	1,099,511,627,776 (about 1 trillion)	300 hours of video

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Identifying System Components for Input and Output

IC3 1-2.1.1

As you learned in Lesson 2, the system unit houses a computer's processing hardware, including the motherboard. In addition to the processor and memory chips, components for connecting peripheral devices are attached to the motherboard. See **Figure 5–2**.



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FIGURE 5–2 Motherboard with components for peripheral devices

Peripheral devices include keyboards, mice, printers, monitors, and other display screens. To use peripheral devices with your computer, they must be connected to the computer in some way, which is the purpose of ports and expansion cards on the motherboard.

Ports and Buses

VOCABULARY

port

bus

Universal Serial Bus (USB)

USB hub

FireWire (IEEE 1394)

A ***port*** is a connecter located on the system case that you use to plug peripheral devices into the computer. Inside the system unit, a port is attached to a bus on the motherboard. A ***bus*** is a sequence of electronic circuitry used to transfer data among computer components. For example, the CPU has buses to move data between CPU components, such as the control unit and the ALU. Peripheral devices use a bus, sometimes called an expansion bus, to exchange data with the motherboard.

A computer has different types of ports to accommodate a variety of device plugs. So that the device can communicate with the CPU and other components when it is plugged into a computer, each port must be connected to an appropriate bus on the motherboard. One of the most common types of buses is the ***Universal Serial Bus (USB)***, which you can use to connect 127 different devices to a single USB port. Personal computers typically have four to eight USB ports on the back, front, or side of the system unit. If you run out of ports on a computer, you can attach a USB hub to increase the number of ports you can use. A ***USB hub*** is a device that contains a number of USB ports itself, and plugs into a single USB port on a computer. **Figure 5–3** shows a USB port and plug, which are probably familiar to you.

ABOVE AND BEYOND

Just as software is continually improved and updated, hardware for computers is also continually improved with the goal of larger and faster data transfer. These improvements are measured in standards. (A *standard* is a set of specifications that define a technology.) For USB ports, the original USB 1.0 standard was fairly slow, transferring about 12 million bits per second (Mbps). USB 2.0 transfers data at speeds between 480 Mbps and 4.8 gigabits per second (Gbps). USB 3.0 is a recent and more advanced version of USB technology, with speeds about 10 times faster than USB 2.0. The current USB standard provides a fast, convenient way to connect peripheral devices to a computer. The IEEE 1394 bus standard supports data transfer rates of up to 400 Mbps; IEEE 1394b provides speeds up to 3.2 Gbps.



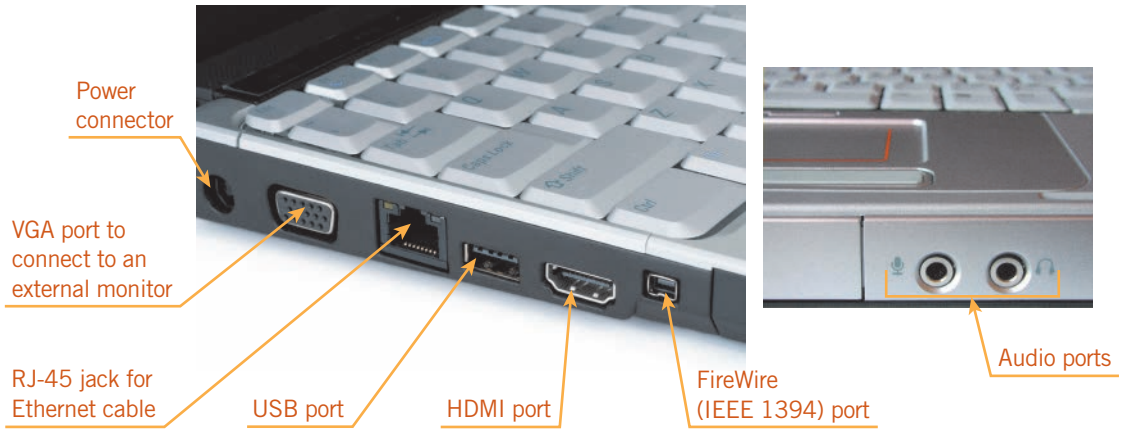
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FIGURE 5–3 USB port and plug

Another type of bus is called ***FireWire***, or ***IEEE 1394***, which was developed by Apple as a high-speed method for connecting multimedia devices such as video cameras to a computer. Like USB, a single FireWire port can accommodate many external devices.

In addition to USB and FireWire ports, you might find the following types of ports on computing devices. Some of these ports are identified in **Figure 5–4**, which shows the side and front of a laptop computer.

- *Audio*—Connects speakers, headphones, and a microphone to the computer
- *RJ-45*—Connects the computer to a wired network using an Ethernet cable
- *Video Graphics Array (VGA) and High-Definition Multimedia Interface (HDMI)*—Standards for connecting display monitors



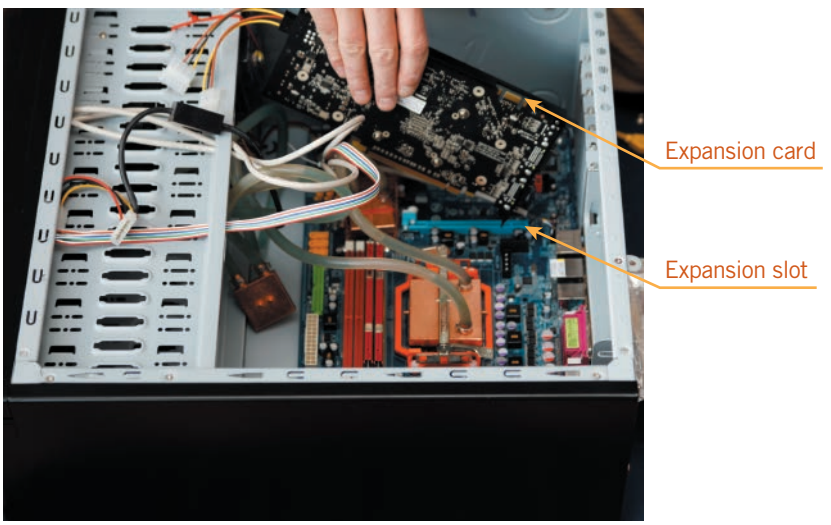
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FIGURE 5–4 Ports on a laptop computer

Expansion Cards

Circuit boards called ***expansion cards*** or ***adapter cards*** can be plugged into expansion slots on the motherboard of a desktop or server computer. As their name suggests, expansion cards expand the capabilities of the computer or let you attach a peripheral device to the computer. For example, most desktop computers include a sound card to connect a microphone, headphones, and speakers to the computer. Most computers also include video cards, sometimes called graphics cards, to attach a monitor to the computer. These cards are installed so they provide audio and video ports on the outside of the computer case. The motherboard usually provides extra expansion slots so you can install expansion cards for new hardware, such as a high-definition TV tuner that makes it possible to watch television shows on your computer. **Figure 5–5** shows an expansion card being installed in a desktop computer.

VOCABULARY
expansion card
adapter card

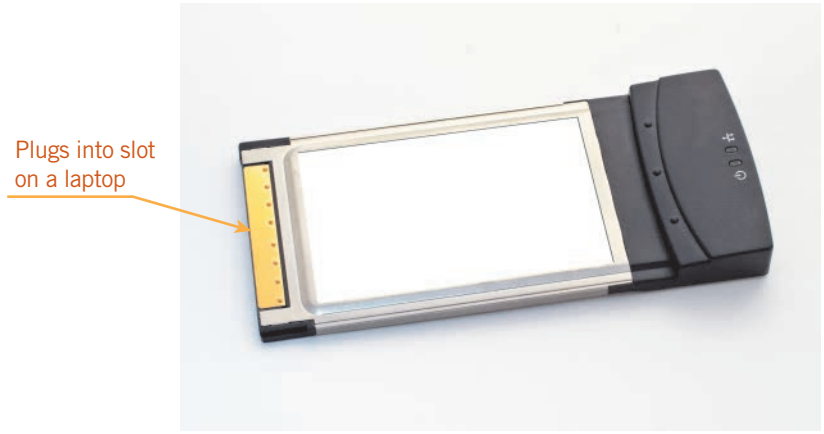


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FIGURE 5–5 Expansion card

VOCABULARY
ExpressCard module
USB adapter
input device

Instead of expansion cards, a mobile computer uses ***ExpressCard modules*** and ***USB adapters***, which are smaller than expansion cards (about 3 inches long) and are plugged into slots or ports that you can access outside of the system unit. For example, you could use an ExpressCard module to connect a laptop to a TV tuner. See **Figure 5–6**.



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FIGURE 5–6 ExpressCard module

A USB adapter connects a computer with a USB port to a device that doesn't have a USB plug, such as an older printer. You can also use USB adapters to connect wireless devices, including mice and keyboards. In this case, the mouse or keyboard doesn't have a USB plug, but still needs to send data to the computer. The USB adapter is plugged into the computer and receives infrared waves from the wireless mouse; the adapter converts the waves into signals that move the onscreen pointer.

Because you don't have to open the system unit to install an ExpressCard module or USB adapter, they are much easier to work with than expansion cards. USB adapters also work with desktop computers, though ExpressCard modules do not.

IC3
1-2.1.1

Using Input Devices

An ***input device*** is a peripheral device you use to enter data and commands into the computer. An input device can be as simple as a keyboard or as sophisticated as equipment used for voice recognition. The type of input device you use is determined by the task you need to perform. For example, in your work in earlier lessons, you had to type, point, and click to enter data and commands into a computer.

Keyboards

The keyboard is the most common input device for entering text and numbers into a computer. Keyboards can be built into the computer, as they are in mobile computers, attached using a cable plugged into a USB port, or connected using a wireless connection. **Figure 5–7** shows a typical keyboard for a desktop computer, which includes special-purpose keys in addition to those for typing text and numbers.



© iStockphoto/Robert Kirk

FIGURE 5–7 Typical desktop computer keyboard

Like most keyboards, the one shown in Figure 5–7 arranges keys into groups. In the center are the standard alphabetic and numeric keys. Along the top are media keys, which you use to control media settings such as speaker volume. Below the media keys are function keys, which software uses for special purposes. For example, most applications display Help information when you press the F1 key. To the right is the numeric keypad, which arranges keys so you can enter numbers quickly. In addition, the keyboard has modifier keys, such as the Alt key, which you hold as you press other keys to perform a task; navigation keys, which move the insertion point on the screen; and toggle keys, which can be on or off. For example, the Caps Lock key is a toggle key—you press it to type in all uppercase letters, and then press it again to return to lowercase typing.

ABOVE AND BEYOND

The computer keyboard is derived from the manual typewriter, which arranged the keys in an inconvenient QWERTY layout so that people would type slowly and avoid jamming the keys. *QWERTY* refers to the first six keys in the upper-left part of a typewriter. Operating systems do provide simplified, more convenient layouts, especially for onscreen keyboards. For example, all PC operating systems let you use a Dvorak keyboard, which arranges the keys for speed and efficiency when typing in English. The most common letters are on the home row, the row where your fingers rest, and the least common keys are on the bottom row, which is the hardest to reach. Alternate keyboard layouts such as the Dvorak keyboard have been slow to catch on with computer users because QWERTY keyboards are so widespread, they are the type of keyboard most users are initially trained to use.

Mobile computers have more limited keyboards that provide only essential keys needed for input tasks. This is because the keyboards on mobile computers are built into the system unit, and therefore need to be compact. For example, the keyboard shown in **Figure 5–8** does not include media keys or a numeric keypad. Mobile computer users who want these extra keys can attach a desktop computer keyboard through a wireless or wired USB connection.



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FIGURE 5–8 Built-in keyboard on a laptop computer

While laptop keyboards are built into the computer, other mobile devices use clip-on keyboards or onscreen keyboards, which are also called virtual keyboards. If the device has a touchscreen, you can touch the screen directly to use the onscreen keyboard. Other innovative types of keyboards include the following:

VOCABULARY
ergonomic

- *Ergonomic*—An ***ergonomic*** keyboard is designed to provide comfort and avoid stress or fatigue to your hands, wrists, and arms.
- *Specialized*—Some keyboards include specialized keys that represent specific items for input such as food orders and are used in fast-food restaurants and other workplaces.
- *Foldable or flexible*—An easily transported keyboard primarily used with mobile devices, this type of keyboard is soft to the touch and is water resistant. See **Figure 5–9**.



© iStockphoto/arturbo

FIGURE 5–9 Flexible keyboard

Pointing Devices

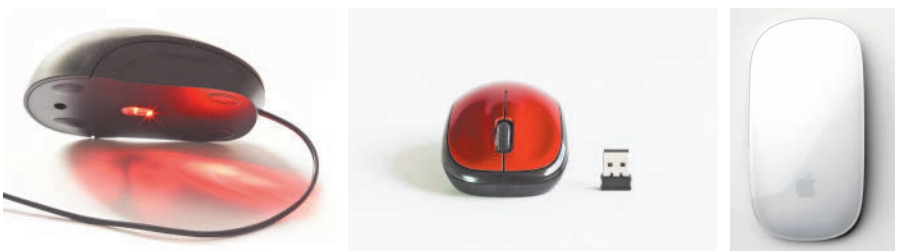
A ***pointing device*** is an input device you use to position the pointer on the screen. The pointer appears as an arrow, I-beam, or other shape as you work with software. You use the pointer to select onscreen objects such as text, graphics, buttons, icons, and links. The following sections discuss various pointing devices.

VOCABULARY
pointing device
mouse

Mice

The ***mouse*** is a pointing device that fits comfortably in the palm of your hand. You move a mouse on a smooth horizontal surface to control the pointer on the screen. The bottom of the mouse is flat and contains a mechanism that detects movement. Most mice have left and right buttons or touch-sensitive areas with a wheel in the middle that you can roll with a fingertip to scroll the screen. Popular types of mice include the following and are shown in **Figure 5–10**:

- *Optical*—An optical mouse uses a laser to detect movement.
- *Wireless*—A wireless mouse is a battery-powered device that relies on infrared waves to communicate with the computer.
- *Touch mouse*—A touch-sensitive mouse recognizes gestures in addition to standard clicks. For example, you can sweep your thumb on the mouse to scroll the screen.



Optical mouse
© iStockphoto/RinoCdZ

Wireless mouse and USB adapter
© SAYAM TRIRATTANAPAIBOON/Shutterstock

Touch mouse
© iStockphoto/duckycards

FIGURE 5–10 Types of computer mice

Like keyboards, mice are attached to the computer using a wired USB connection or a wireless connection.

Touchpads

VOCABULARY
touchpad
pointing stick
trackball

A ***touchpad*** (also called a trackpad) is a touch-sensitive surface that can convert the motion and position of your fingers to a relative position on screen. Touchpads are usually rectangular and include left and right buttons that serve the same function as mouse buttons. Most laptop computers include a touchpad so you can use the computer without attaching a mouse. Portable media players such as iPods include circular touchpads for selecting songs and other media. Touchpads are also available as separate devices for desktop computer users. Some touchpads accept the same types of motions you make on a touchscreen, such as sliding a finger to drag an onscreen object. **Figure 5–11** shows a variety of touchpads.



Built-in touchpad
© goldyg/Shutterstock



External wireless touchpad
© iStockphoto/Goldmund



Touchpad on an iPod
© iStockphoto/Bosca78

FIGURE 5–11 Touchpads

Pointing Sticks

Some mobile computers contain a ***pointing stick***, a pressure-sensitive device that resembles a pencil eraser. It is located on the keyboard, generally between the G, H, and B keys. See **Figure 5–12**. You move a pointing stick with your forefinger, while using your thumb to press related keys. In a confined space, many people find a pointing stick more convenient than a mouse. IBM popularized this device by introducing the TrackPoint on its ThinkPad notebooks.



© iStockphoto/trevarthan

FIGURE 5–12 Pointing stick

Trackballs

A ***trackball*** is a pointing device that works like a mouse with a ball on top of the device. You use your thumb and fingers to manipulate the ball, which controls the pointer on the screen. A trackball is stationary, making it a good alternative to the mouse when you have limited workspace. Trackballs are also easier to use if you have limited hand or finger mobility. As shown in **Figure 5–13**, some trackballs are separate devices you connect to the computer as you do a mouse; others are built into the keyboard.



Wireless trackball
© iStockphoto/pengpeng



Trackball built into a keyboard
© iStockphoto/deepblue4you

FIGURE 5–13 Trackballs

On a Windows computer, you display the Hardware and Sound category in the Control Panel to view the hardware on your computer and change settings for it. In Step-by-Step 5.1, you display the Hardware and Sound category to open the Mouse Properties dialog box and review your settings for a mouse or other pointing device. Because these settings are customized for the mouse installed on a computer, the settings can vary from one computer to another. Your computer should be turned on and displaying the Start screen before you perform the following steps.

Step-by-Step 5.1

1. On the Start screen, begin to type **Control Panel**, and then click **Control Panel** in the search results to open the Control Panel Home page.
2. Click **Hardware and Sound** to display the Hardware and Sound window. See **Figure 5–14**. The options in this window vary depending on your computer hardware, so your screen might differ.

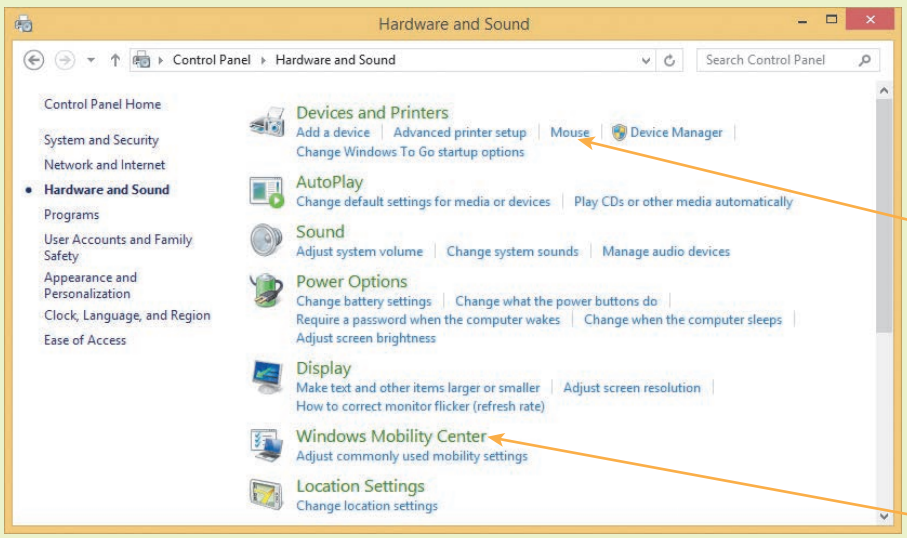
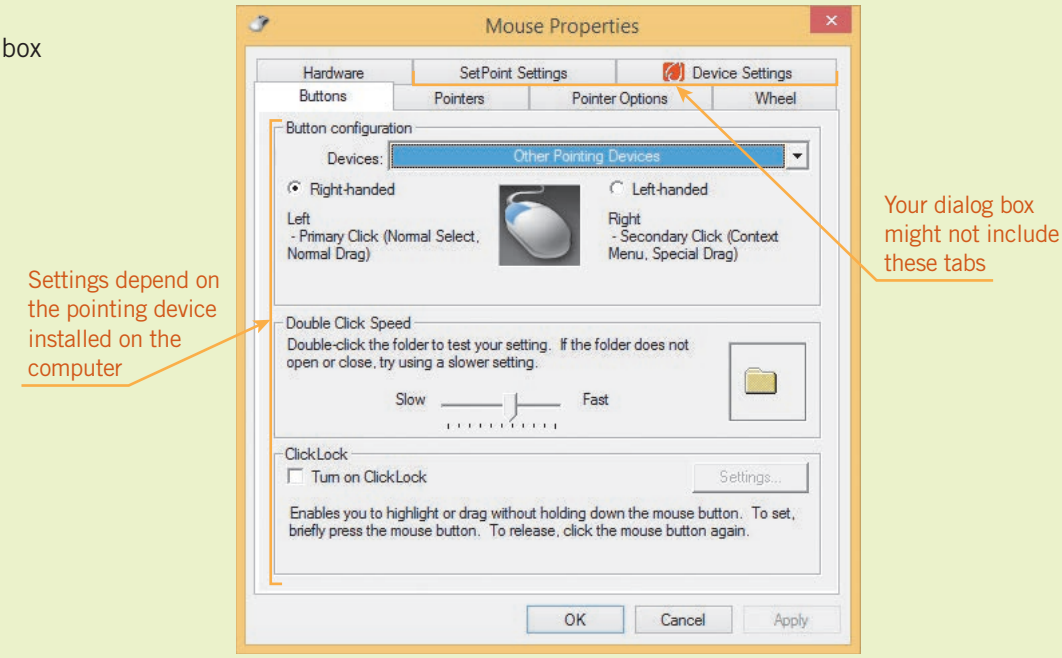


FIGURE 5–14
Hardware and Sound window

3. In the Devices and Printers category, click the **Mouse** link to open the Mouse Properties dialog box. If necessary, click the **Buttons** tab to display this tab. See **Figure 5–15**.

FIGURE 5–15
Mouse Properties dialog box



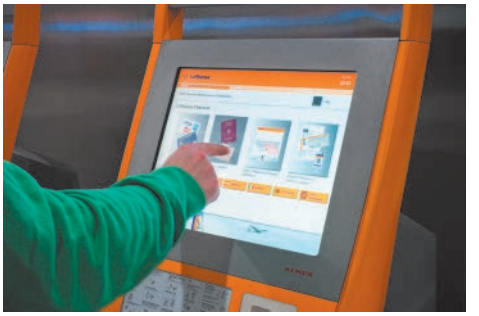
4. Click each of the other tabs in the Mouse Properties dialog box to view the other settings available for your pointing device.
5. Click the **Cancel** button to close the Mouse Properties dialog box without saving your changes. Leave the Hardware and Sound window open for the next Step-by-Step.

Touchscreens

Many mobile computers, especially tablets and smartphones, use touchscreens, which have a touch-sensitive surface that overlays the screen display and responds to the electrical impulses in your fingertips. In addition, computers provided at kiosks in public places, such as an airport, have touchscreens to make it easy for users to enter data and select options. See **Figure 5–16**. Touchscreens are popular because they let you interact with a computer without using an external input device.



Touchscreen on a tablet
© Patryk Kosmider/Shutterstock



Touchscreen kiosk at an airport
© iStockphoto/code6d

FIGURE 5–16 Touchscreens

Touchscreens are not technically pointing devices because they allow you to interact with a GUI without moving an onscreen pointer. Instead, you move your hand to a location on the screen and then tap your finger on an object or make a gesture, which involves moving one or more fingers on the touchscreen. For example, on many touchscreens, you touch the right side of the screen and then swipe your finger to the left to scroll and display information out of view. Touchscreens that accept input from more than one finger are called multitouch displays.

ABOVE AND BEYOND

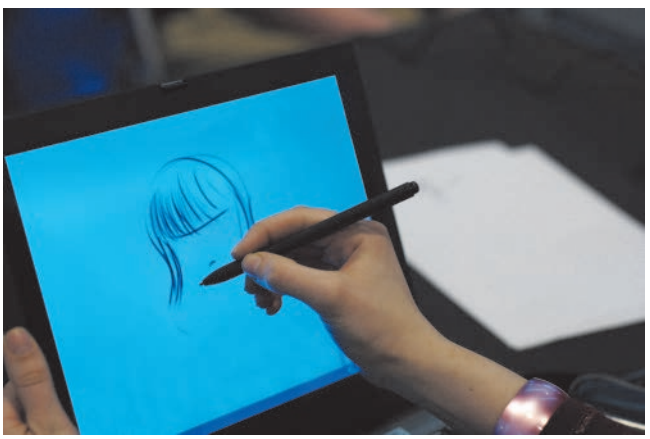
Touchscreens have been around longer than you might think. The first screen to use touch technology was an air traffic display screen, developed by E.A. Johnson in 1965. In 1993, IBM and telephone company BellSouth released Simon, the first product to use a touchscreen with a phone. Touchscreens became commonplace when Apple introduced the iPhone in 2007.

Digital Pens

Many mobile computers and some desktop computers accept input from a ***stylus***, which is a pen-like writing instrument that works with touchscreens. See **Figure 5–17**. You use a stylus for precise touch input by writing, drawing, or tapping on a screen. You often use a stylus to provide an electronic signature on a touch-sensitive pad in a retail location.

VOCABULARY

stylus



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FIGURE 5–17 Drawing on a tablet computer with a stylus

Other types of digital pens are devices you use to write or draw on any surface, though some require special paper. The digital pen captures your notes or sketches so you can transfer them to a computer.

Audio Input Devices

VOCABULARY
audio input
video input
digital video (DV) camera

Audio input is sound entered into a computer, and includes speech, sound effects, and music. Examples of audio input devices are microphones, portable music players, radios, and other hardware such as electronic piano keyboards. Voice or speech input is a category of audio input. With the appropriate kind of software, you can use voice-recognition devices such as built-in or external microphones to speak commands into the computer and to enter text. External microphones are typically part of a headset, which includes one or two headphones for audio output and a microphone for audio input. See **Figure 5–18**. Mobile phones and hands-free navigation systems in motor vehicles use voice-recognition systems, as do devices that accept voice commands to control wheelchairs and other objects that increase mobility.



© iStockphoto/bowdenimages

FIGURE 5–18 Using a headset with microphone

Video Input Devices

When you capture still or moving images with a digital camera, they are stored digitally in the camera as ***video input*** to the device. The images can also be used as video input to a computer. After transferring the images to the computer, you can view and edit them with photo-editing or video-editing software. Most tablets and smartphones include digital cameras so you can skip the transferring step and take photos directly with your mobile device.

A PC video camera or Webcam is a type of ***digital video (DV) camera*** you can use to send live images over the Internet, participate in video telephone calls, and send e-mail messages with video attachments. Most computers include built-in Webcams, though they are also available separately.

Besides capturing images, you can use the cameras built into mobile devices to conduct video phone calls that allow you and your contact to see each other while you speak. See **Figure 5–19**.



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FIGURE 5–19 Using video input during a phone call

Specialized Input Devices

Other input devices are used for specialized applications. These include game controllers, which you use when playing games, especially those that simulate driving a car or flying a plane, and many types of scanners and security devices. The following sections describe these input devices.

Game Controllers

The joystick and wheel are types of pointing devices you use when playing games or as adaptive equipment when you need an alternative to a mouse, which requires expert fine-motor skills. A joystick consists of a plastic or metal rod mounted on a base. You can move the rod in any direction. Some joysticks have switches or buttons that you can manipulate to enter data or select options. A wheel is similar to a steering wheel; you use it to simulate driving a vehicle. See **Figure 5–20**. Most wheels also include foot pedals for braking and acceleration actions.



Joystick
© iStockphoto/peregrina

Wheel
© iStockphoto/pagadesign

FIGURE 5–20 Game controllers

Other types of input devices used with games include musical instruments such as guitars and motion-sensitive controllers such as dance pads and balance boards.

Scanners

VOCABULARY
scanner
bar code
RFID reader
RFID tag

Scanners are devices that can change images into codes that the computer accepts as input. The quality of a scanner is measured by pixels per inch (ppi). The higher the ppi number, the better the input image. Scanners are available in various sizes and types, including the following. Some of these scanners are shown in **Figure 5–21**.



Flat-bed scanner
© iStockphoto/lisegagne



Bar code scanner
© iStockphoto/Syldavia



RFID tag and scanner
© iStockphoto/nullplus

FIGURE 5–21 Scanners

- *Flat-bed scanners*—These devices convert printed documents and images into an electronic object that you can store in a computer's memory. You can then manipulate the documents and images. Flat-bed scanners resemble copy machines, with a glass surface where you place the material you want to scan. Text you scan is stored as a single object, which means you cannot edit it.
- *Bar code scanners*—A ***bar code*** is a matrix or series of lines with varying widths and heights that represents letters and numbers. Figure 5–21 shows the type of scanner that reads bar codes printed on products, such as at a grocery store. Many mobile phones can also scan and read bar codes, especially Quick Response (QR) codes, which are configured as squares rather than lines. You might scan a QR code in a print ad with your mobile phone to display a product's Web site.
- *Radio frequency identification (RFID) readers*—***RFID readers*** scan the codes stored in an ***RFID tag***, a tiny chip with a radio antenna that can be attached to almost anything, including products, price tags, and shipping labels. RFID readers can scan many tags at once, which is an advantage over bar code scanners.
- *Magnetic scanners*—These devices read encoded information on credit cards. The magnetic strip on the back of each card contains the user's encoded account number.
- *Wireless scanners*—These scanners use Bluetooth wireless technology to scan bar code data, such as from a hospital bracelet, and transmit it to a computer.
- *Optical character recognition (OCR) and optical mark recognition (OMR) scanners*—These devices use a light source to read characters, marks, and codes; the data is then converted into a digital format. Banks use OCR technology to scan checks. Commonly known as Scantrons, schools and other organizations use OMR for testing purposes.

Biometric Devices

Consider the following scenario: You are going on a two-week vacation overseas—you are packed and ready to go, but you don't need a wallet or credit cards. You use your fingerprint as an input device to pay for all of your expenses. Such technology is called biometrics.

Biometrics is a security technique using automated methods of recognizing a person based on a physical characteristic. Biometric devices consist of scanning hardware and software that converts the scanned physical information into a digital format. Additional software compares the scanned information to a collection of stored biometric data. For example, if your fingerprint matches a stored image, you are authorized to use a computer or complete a transaction.

Figure 5–22 shows a keyboard with a built-in fingerprint scanner, which you can use to identify yourself by swiping a fingertip over the scanner instead of entering a password, for example.

VOCABULARY
biometrics



© iStockphoto/pmphoto

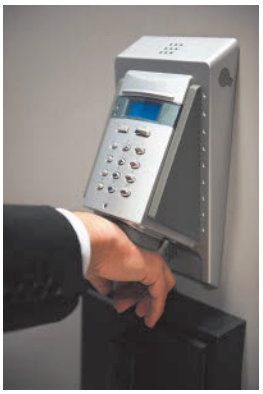
FIGURE 5–22 Keyboard with fingerprint scanner

ETHICS IN TECHNOLOGY

Ethics of Biometrics

Biometric security devices provide an easy way to protect personal property, but they are controversial when used in business and government. For example, law enforcement at all levels of government can use facial recognition technology to identify criminals in large public areas, where it can be difficult to maintain security. However, facial recognition technology currently has a high rate of error—using it means some people could be accused of crimes they did not commit. In addition, biometric methods work by comparing a physical feature, such as a person's face, with stored data, such as a high-resolution image. Privacy advocates want to know how this data is being obtained and how secure it is. Could a hacker steal the biometric data and use it to pose as someone else? The ethical question is whether the loss of privacy is worth the added security, especially if biometric data is vulnerable to fraud or identity theft.

In addition to identifying people based on their fingerprints, biometric technology can identify people based on face, handwriting, or voice recognition. Other less common techniques use the retina (analysis of the capillary vessels located at the back of the eye), iris (analysis of the colored ring surrounding the eye's pupil), hand geometry (analysis of the shape of the hand and length of the fingers), or vein (analysis of the pattern of veins on the back of the hand and the wrist). See **Figure 5–23**.



Hand-scanning biometric device
© iStockphoto/baranozdemir



Eye-scanning biometric device
© iStockphoto/NKND200

FIGURE 5–23 Biometric input devices

1-2.1.1

Using Output Devices

As you learned in Lesson 1, output is data processed into a useful format. Examples of output are printed text, spoken words, music, pictures, video, and graphics. Output devices display information, and include monitors, projectors, printers, and speakers. This section discusses the various output devices in more detail.

Display Devices

VOCABULARY

monitor

liquid crystal display (LCD)

Desktop computers typically use a ***monitor*** as their display device. The screen is part of the monitor, which also includes the housing for its electrical components. Mobile computers use integrated flat-panel screens usually called display screens.

The most popular technology for computer monitors is the ***liquid crystal display (LCD)*** technology, which manipulates light within a layer of liquid crystal cells to produce an image. LCD screens are compact and lightweight, display images clearly, and use energy efficiently. See **Figure 5–24**.



© iStockphoto/Nik_Merkulov

FIGURE 5–24 LCD screens on a range of devices

LCD screens are illuminated from the back of the screen, which is called backlighting. Standard LCD screens use fluorescent backlighting, which is not environmentally friendly. That technology is being replaced by light-emitting diode (LED) technology, which creates higher contrasts and consumes less energy than fluorescent backlighting.

Screen Resolution and Size

Display screens form images by combining pixels of color. A ***pixel*** (short for *picture element*) is the smallest surface area that can contain color on a display device. The number of pixels displayed on a screen is called the ***screen resolution***, which determines the amount of information that can be displayed at one time. Screen resolution is expressed as the number of horizontal pixels by the number of vertical pixels, as in 1366 × 768 screen resolution. At higher resolutions such as 1600 × 900, your screen can display more information, with text and objects smaller and sharper than at lower resolutions, such as 1024 × 768, which display less information using larger objects that are not as sharply defined.

The video card installed in your computer determines the resolutions available for your display screen. The video card also determines at what resolution an LCD monitor displays the sharpest images and clearest text, which is called its native resolution. When you purchase a computer, the display screen is almost always set to the native resolution. You can usually change the resolution to a lower setting to make the onscreen objects larger, though the text might not be as clear as text displayed at the native resolution.

If you shop for a monitor or mobile computer, be aware that display screens are measured diagonally from corner to corner. Desktop computer monitors range from 17 to 30 inches, though larger ones are available for special purposes. Laptop computer screens are usually between 14 and 17 inches, while tablet screens are between 7 and 10 inches. Most current displays are widescreen, which means they use a 16:9 or 16:10 aspect ratio similar to widescreen televisions. The ***aspect ratio*** is the ratio of the width to the height.

To change the screen resolution in Windows, you use the Screen Resolution window, which is a Control Panel tool. In Step-by-Step 5.2, you change the screen resolution on your computer, and then return to your original resolution.

VOCABULARY

pixel

screen resolution

aspect ratio

ABOVE AND BEYOND

Three exciting technology advancements in LCD computer displays use 3D technology. Stereo displays project identical images and superimpose them to present an image in stereo, which creates the illusion of depth. This technology requires glasses to experience the 3D effect. Autostereoscopy displays use lenses or filters to create a 3D effect without requiring viewers to wear special glasses. Finally, you can actually wear some 3D displays as glasses, which project images as if you were viewing them on a large, distant screen.

Step-by-Step 5.2

QUICK TIP

You can also adjust screen resolution using the Display option in the PC and devices category of the PC settings screen.

1. In the Hardware and Sound window, click the **Adjust screen resolution** link in the Display category to open the Screen Resolution window. See **Figure 5–25**.

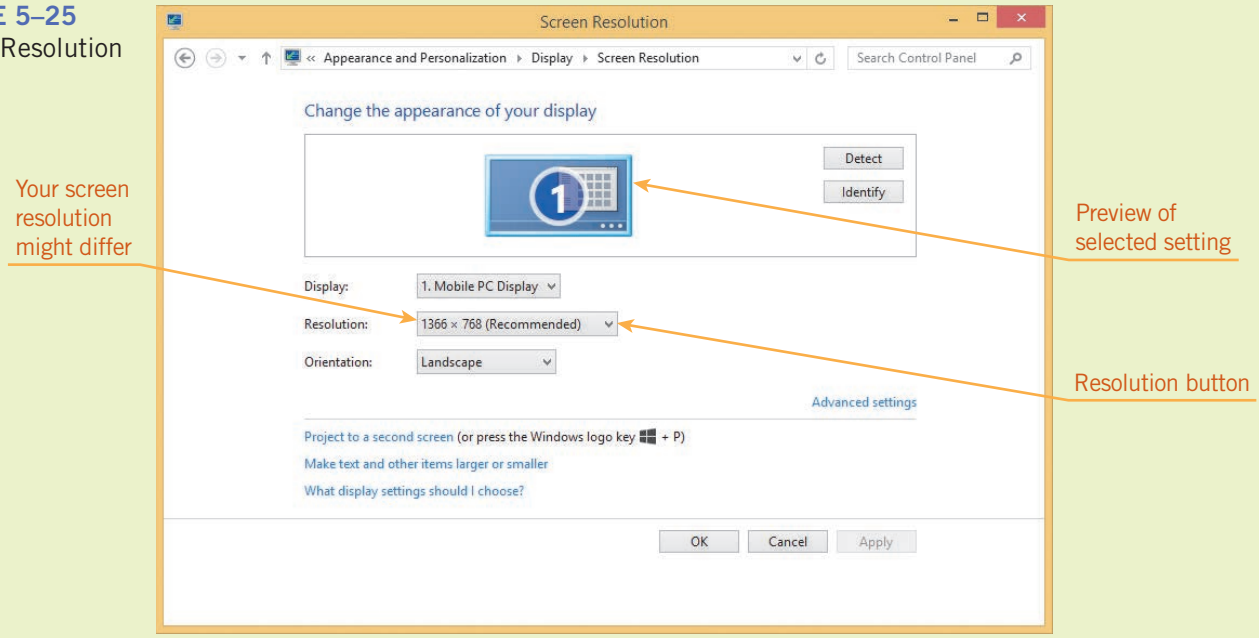


FIGURE 5–25
Screen Resolution window

2. Click the **Resolution** button to display the options available on your computer. See **Figure 5–26**.

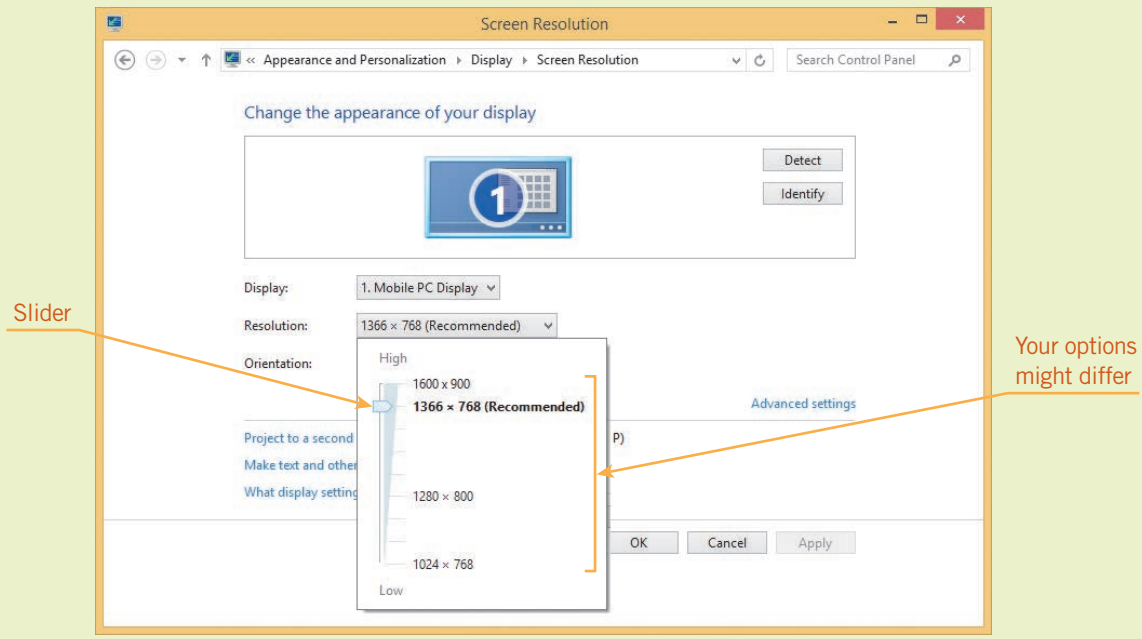


FIGURE 5–26
Displaying screen resolutions

3. Drag the slider up to increase the resolution to its highest setting, if possible. The settings appear in the Resolution box as you drag the slider. The preview area shows the relative size of the new resolution.
4. Click a blank area of the Screen Resolution window to close the list of resolution settings, and then click the **Cancel** button to return to the Hardware and Sound window.

QUICK TIP

If your screen resolution is already set at its highest setting, drag the slider down to the next lower resolution.

Projectors

Another type of display device is a ***projector***, also called a data projector, which connects to a computer and projects images onto a wall screen or other large, flat surface. Projectors can be small, freestanding devices designed for use with mobile computers, or large units mounted onto a ceiling. See **Figure 5–27**. Small computer projectors use LCD or ***digital light processing (DLP)*** technology, which bounces light off microscopic mirrors on a computer chip. Each mirror corresponds to a small dot of color on the projected image. DLP projectors produce sharp, bright images that are easy to see even in a well-lit room.

VOCABULARY

projector

digital light processing (DLP)



Portable projector
© iStockphoto/vm



Ceiling-mounted projector
© iStockphoto/LordRunar

FIGURE 5–27 Portable and ceiling-mounted projectors

Printers

As you know, printers produce a paper copy, or hard copy, of processing results. Printer output is called hard copy because it is tangible—you can touch it—and more permanent than other forms of computer output. (In contrast, output on a display screen is called soft copy because it is temporary.) Printers are classified as nonimpact or impact printers. Nonimpact technology is more recent, and produces text and graphics without the printer components directly contacting paper. Impact printers have pins or other mechanisms that physically strike paper to print text and images. Most home and office computer users have nonimpact printers because they print faster and more quietly than impact printers and produce higher quality output.

If you are selecting a printer to purchase, consider the following features:

- *Speed*—Printer speed is measured in pages per minute (ppm). The number of pages a printer can print per minute varies for text and for graphics. Graphics print more slowly than regular text.
- *Print quality*—Print quality is measured in dots per inch (dpi). The higher the dpi, the better the resolution or print quality.

- *Price*—The price includes the original cost of the printer and what it costs for the ink or toner, which is a black or colored powdered ink that binds to paper when heated. You can purchase a good-quality printer inexpensively for your home use, whereas a high-output system for business can cost thousands of dollars.

The most popular types of printers used today are inkjet and laser printers. When a printer combines output options such as printing, scanning, copying, and faxing, it is called a multifunction printer.

Inkjet Printers

VOCABULARY
inkjet printer
laser printer

An ***inkjet printer*** is a nonimpact printer that creates text and images by spraying ink onto paper. The ink is contained in cartridges, typically one for black ink and others for color. The color inks are sometimes included in one cartridge. Inkjet printers use CMYK color, which creates many shades of color by combining cyan (blue), magenta (pink), yellow, and black. Some high-end inkjet printers use six colors to create richer, more varied output. See **Figure 5–28**.



© Natthawat Wongrat/Shutterstock

© vetkit/Shutterstock

FIGURE 5–28 Inkjet printer and cartridges

Each ink cartridge has from fifty to several hundred small holes, or nozzles, and the ink is forced through a nozzle to release a dot of color on the paper.

Inkjet printers are the most popular type of printer for home users because they are affordable, compact, and produce good-quality color output. Photo printers, which can print high-quality photos, use inkjet technology.

Laser Printers

A ***laser printer*** is a nonimpact printer that produces text and images using the same technology as copier machines. As a light-sensitive drum revolves in the printer, a laser beam etches text and images on the drum as a pattern of electrical charges. The printer then coats the drum with toner, which is contained in a cartridge. Using static electricity, the toner clings to the areas containing text and images. As the drum continues to revolve, it heats up and rolls over a sheet of paper to transfer the toner to the page. See **Figure 5–29**.



© iStockphoto/dem10

FIGURE 5–29 Laser printer and cartridge

Laser printers produce high-quality output faster than inkjet printers, but are slightly more expensive, even those that produce only black-and-white output. Color laser printers cost much more than color inkjet printers. Because of their speed and quality, laser printers are popular with business users and anyone else who needs to produce a high volume of printed material.

Specialized Printers

Impact printers, which include the dot matrix and line printer, were the first type of printer developed for personal computing. Dot matrix printers transfer ink to the paper by striking a ribbon with pins contained in a printhead. The higher the number of pins, the better the resolution of the output. The speed of a dot matrix printer is measured in characters per second (cps). With the reduction in cost of laser and ink jet printers, dot matrix printers are seldom used today. The line printer is a high-speed variation of the dot matrix printer used with large computers such as servers.

Several other types of specialty printers are available, including the following:

- *Thermal*—A thermal printer forms characters by heating special heat-sensitive paper. Retail stores, including gas stations, often print receipts using thermal printers.
- *Mobile*—A mobile printer is a small, battery-powered printer, primarily used to print from a mobile computer, including tablets and smartphones. Mobile printers use inkjet or thermal print technology.
- *Label and postage*—A label printer prints labels of various types and sizes on paper that contains an adhesive on one side. A postage printer is a special type of label printer that contains a built-in digital scale and prints postage stamps.
- *Plotters and large-format*—Engineers, architects, and graphic artists use plotters and large-format printers for drawings and drafting output.

ABOVE AND BEYOND

According to Evolve Recycling (www.evolverecycling.com), it takes about one gallon of oil to produce a toner cartridge, and up to 450 years for a toner cartridge to decompose in a landfill. Every year, more than 300 million inkjet and toner cartridges are buried in landfills, which creates 150 million pounds of waste. To reduce the amount of waste, you can recycle inkjet and toner cartridges. Recycling companies refill and repair the cartridges, and then sell them as remanufactured products.

Audio Output Devices

Speakers are another type of output device. Speakers, headphones, and earbuds generate sound, such as music or speech. Most computers have an internal speaker that produces low-quality sound, which is adequate for the beeps, chimes, and other sounds software uses to alert you to software events, such as the appearance of a warning dialog box. You can attach speakers to a computer to produce high-quality sound, especially if you are playing games or watching movies. See **Figure 5–30**.



FIGURE 5–30 Audio output devices

You use headphones or earbuds to hear music, voice, and other audio output privately. Headphones cover the ear, while earbuds rest inside the ear canal. When you plug a pair of headphones or earbuds into the computer, the internal or attached speakers are muted automatically.

In Step-by-Step 5.3, you use the Control Panel to open the Device Manager window, which lists all of the hardware components in your computer as well as the input and output devices attached to it. Besides displaying a comprehensive list of your computer hardware, the Device Manager window shows their status (working properly or experiencing problems), and helps you troubleshoot hardware problems. For example, if a peripheral device doesn't work when you attach it to your computer, you can use Device Manager to solve the problem in the following ways:

- *Look for yellow or red problem icon*—If the device is listed with a yellow warning icon, that means something is wrong with the device or its settings. You can click the icon to learn more about the problem. A red check mark means the device is not working at all.
- *Open the Properties dialog box for the device*—Select the device in the Device Manager window and then use the Properties tool to open the Properties dialog box, which displays many details about a device, including its status, location, and driver information. If the device has a problem, the Status area often describes it. For example, the status for a device might be "This device cannot work properly until you restart your computer." In this case, you can solve the problem by restarting the computer.
- *Check for an updated driver*—Select the device in the Device Manager window and then use the Update Driver Software tool or the Properties dialog box to check a Web site for an updated driver. If one is available, you can download and install the driver, which can solve many hardware problems.

- *Scan for hardware changes*—If the device is not listed in the Device Manager window at all, you can use the Scan for Hardware Changes tool to scan your system for hardware changes, which usually detects and enables the device.
- *Disable and enable the device*—If Device Manager indicates a problem with the device, you can try to solve it by first disabling the device, which means that Windows is not using it. Then you can enable the device, which sometimes resolves conflicts the device might be having with other hardware. Device conflicts can occur when two or more devices are trying to access the same resource, such as memory.

In the following steps, you open the Device Manager window to display the hardware on your computer, and then you examine the properties for your display device. To open the Device Manager window, you must be signed into Windows using an Administrator account. If you are not signed in using an Administrator account, read but do not perform the following steps.

Step-by-Step 5.3

1. In the Devices and Printers category of the Hardware and Sound window, click the **Device Manager** link to open the Device Manager window. See **Figure 5–31**. This window shows the hardware for a particular computer, so your list of devices will vary.

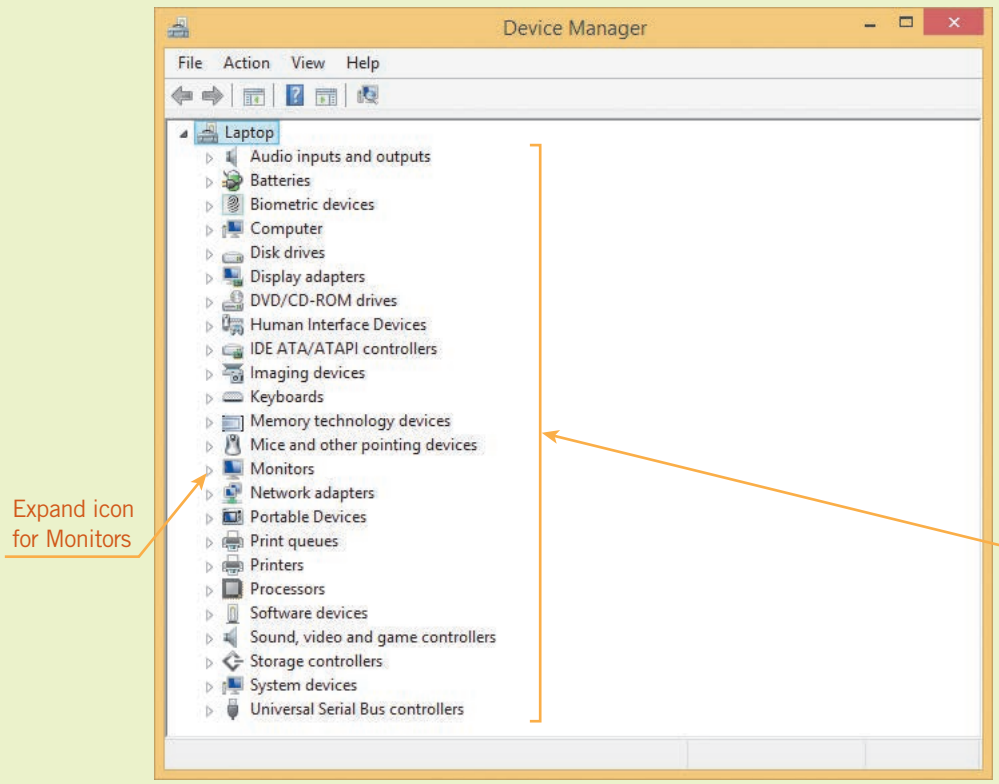


FIGURE 5–31
Device Manager window

QUICK TIP

You can also use a device's shortcut menu to update the driver and scan for hardware changes.

2. Click the **expand** icon next to Monitors to show the display devices on your computer.
3. Right-click a display device, and then click **Properties** on the shortcut menu to open the Properties dialog box for the device. See **Figure 5–32**.

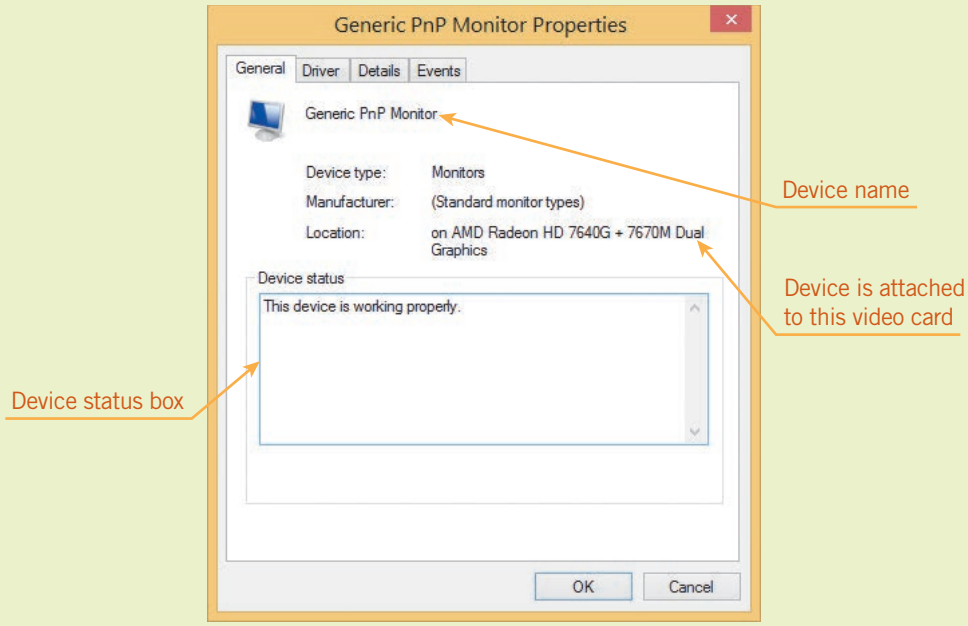


FIGURE 5–32
Properties dialog box for a display device

4. Click the **Driver** tab to display information about the driver for this device. See **Figure 5–33**.

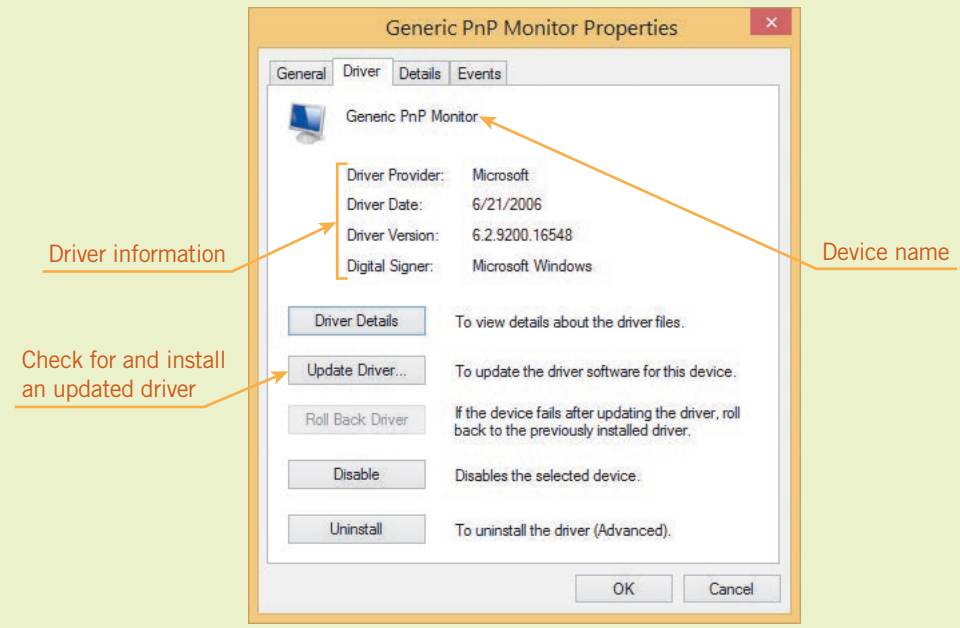


FIGURE 5–33
Driver tab in the Properties dialog box

The top of this tab shows the provider, date, version, and signer of the driver. If a device has a signer, that indicates the driver software comes from a verified publisher and has not been altered since it was released.

You can also use the buttons on this tab to display information about the driver file, check for and install an updated driver, disable the device, or uninstall it. You should uninstall a device only if a computer expert instructs you to do so.

5. Click the **Cancel** button to close the Properties dialog box without making any changes.
6. Close the Device Manager window, and then close the Hardware and Sound window.

Using Storage Media and Devices



1-2.1.2

When you enter data using an input device, the data is stored in RAM, which is temporary memory. If you want to keep a permanent copy of the data, you must save it on some type of storage media. ***Storage media*** are the physical materials used to store data, such as disks and DVDs. Storage media are contained in a ***storage device***, which is the equipment that records and retrieves data from storage media. Storage devices include hard drives, CD/DVD drives, and USB flash drives. The term *storage technology* refers to a storage device and the media it uses. Storage technologies include magnetic, optical, and solid-state technologies.

Each storage technology has benefits and limitations. You can compare them based on the following characteristics:

- *Capacity*—Capacity is the maximum amount of data a media can store, and is usually indicated in gigabytes or terabtyes.
- *Speed*—Speed is measured by access time and the data transfer rate. ***Access time*** is the average number of milliseconds (ms) it takes a computer to retrieve data from the storage device. A millisecond is one-thousandth of a second. The ***data transfer rate*** determines how much data the storage device can move per second from the storage media to the computer. Data transfer rates are measured in bytes per second (bps), such as 10 Mbps, which is 10 megabytes per second.

VOCABULARY

storage media

storage device

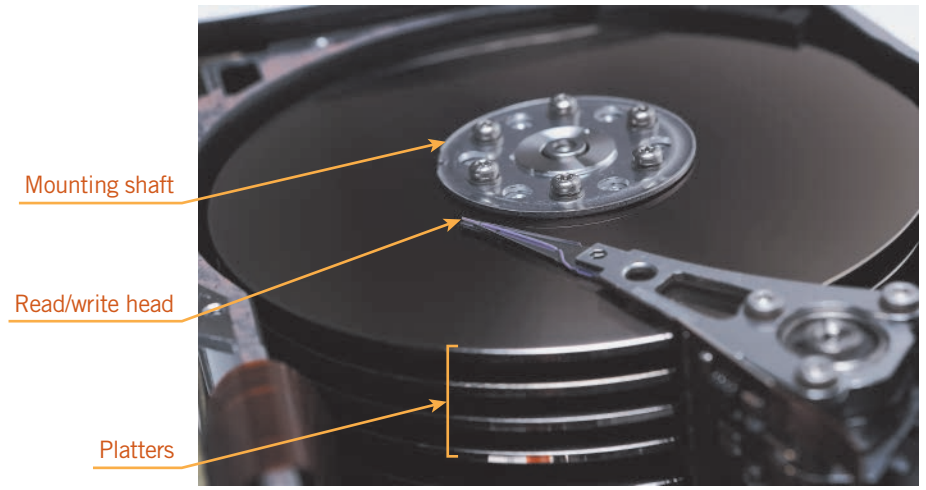
access time

data transfer rate

Hard Drives

VOCABULARY
hard drive
direct-access storage

A ***hard drive***, also called a hard disk drive, is the main storage device in a computer. Although the terms are often interchanged, a hard drive is a storage device, and a hard disk is a type of storage media. Most hard drives use magnetic storage technology to retain data, which involves magnetizing particles on the surface of a disk or tape. Hard drives contain a stack of disks, or platters, made of aluminum or glass that are coated with magnetic iron oxide particles and sealed permanently in the hard drive case. As a platter rotates in the drive, a read/write head retrieves or stores data in concentric rings called tracks. This arrangement allows the mounting shaft in the hard drive to spin a platter to a storage location so the read/write head can save or retrieve data quickly, a method called ***direct-access storage***. See **Figure 5–34**. In contrast, magnetic tape is sequential—it must fast forward or rewind to allow access to a specific storage location.



© Doug James/Shutterstock

FIGURE 5–34 Hard drive

The read/write heads in a hard drive use magnetic charges to retrieve and store data, not direct contact. If the read/write heads do touch the surface of a platter, they can damage data, a condition called a head crash. Although sealed hard drives are rugged, jarring a desktop computer while the hard drive is spinning or somehow allowing dust into the hard drive case can cause a head crash. Because a hard drive contains moving parts—mechanisms to make the platters rotate and the read/write head move—it is also considered a mechanical storage device.

Of all types of computer storage devices, hard drives are the most popular for storing data because of their speed, capacity, and cost. Access times range from 6–11 ms, whereas a CD takes up to 500 ms to retrieve data. Computer ads often note the hard drive speed as revolutions per minute (rpm), which refers to how fast the platters spin when the read/write head is accessing data. The higher the rpm, the faster the read/write heads can locate specific data. Ads always mention the storage capacity of a hard drive as this factor directly affects the computer's price. Hard drives typically range from hundreds of gigabytes to a few terabtyes of storage capacity. Current hard drives store data for pennies per gigabyte.

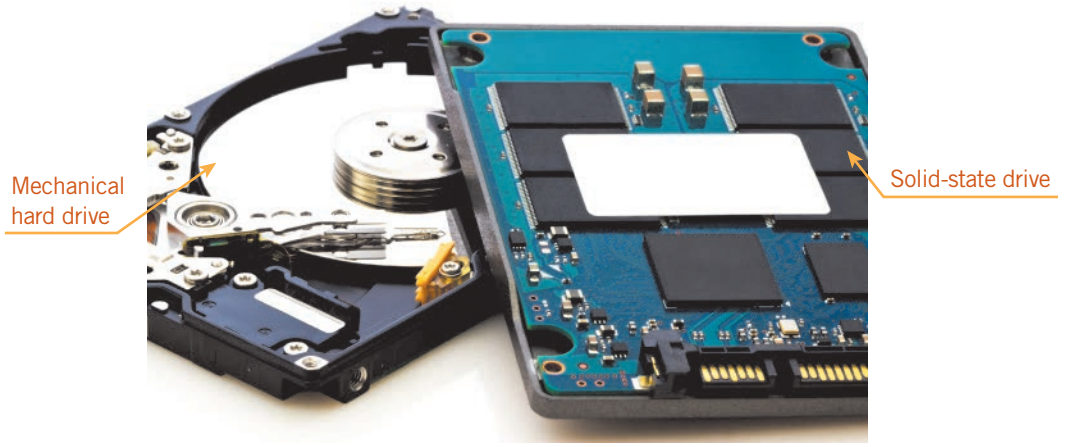
Solid-State Drives

A recently developed type of hard drive is called the ***solid-state drive (SSD)***, which uses flash memory technology to store data as electrical rather than magnetic charges. The advantage that SSDs offer is that they have no moving parts, so they are more durable and reliable than mechanical hard drives. Though they are also more expensive, they consume less power, generate less heat, and retrieve data more quickly, making them a good alternative for tablets and other mobile devices. **Figure 5–35** compares a mechanical hard drive and an SSD, both with their cases removed.

VOCABULARY

solid-state drive (SSD)

external hard drive



© iStockphoto/ludinko

FIGURE 5–35 Hard drive and SSD

External Hard Drives

To increase the storage capacity of your computer, you can use an ***external hard drive***, a separate, freestanding high-capacity storage device that you attach to a computer, usually using a USB port. Physical sizes and storage capacities vary, ranging from small portable devices designed to hold songs, photos, and other personal files, to larger desktop units designed to store copies of an entire computer system. External hard drives can use magnetic or solid-state technology. **Figure 5–36** shows two external hard drives, a small one attached to a laptop, and a larger desktop unit standing on its own.



Portable external hard drive

© iStockphoto/IngaNielsen



Desktop external hard drive

© iStockphoto/bedo

FIGURE 5–36 External hard drives

Portable Drives

In addition to external hard drives, you can attach other types of drives to a computer and use them to store data. These removable drives are ideal for transporting data from one computer to another, adding storage capacity to a computer, and securing data away from a computer. Removable drives use the same solid-state technology as internal SSDs do. The smallest types are collectively called memory cards, which are frequently used with cameras, smartphones, portable media players, and other similar electronics. **Figure 5–37** shows three types of memory cards, including a microSD card, which you insert into an adapter and then plug into a USB port or memory card slot. You insert larger memory cards into a slot on a computer or mobile device, which usually accepts more than one type of memory card.



Secure digital (SD) card © Mega Pixel/Shutterstock

Compact flash (CF) card © Fedorov Oleksiy/Shutterstock

MicroSD card in adapter © Artur Synenko/Shutterstock

FIGURE 5–37 Memory cards

Popular USB flash drives are another type of solid-state storage media. This small removable data storage device uses a USB connector to plug into your computer's USB port or other electronic device. USB flash drives are also known as thumb drives, jump drives, flash drives, and USB sticks.

Storage capacities of solid-state removable drives vary from a few to many gigabytes, which is usually enough to transfer documents, photos, music, and video files.

If you use a USB flash drive with your computer, you should not remove it while the drive is in use. Disconnecting a USB flash drive while it is storing data can damage the files on the device. Windows and other operating systems provide an option to safely remove or eject removable storage devices. In Step-by-Step 5.4, you attach a USB flash drive to your computer, if necessary, and then safely remove it.

ABOVE AND BEYOND

An alternative to storing data on your computer or removable media is to use cloud storage, an Internet service that provides storage space on a server. The advantage of cloud storage is that you can access the data from any computer that has an Internet connection. Cloud storage sites such as SkyDrive, Dropbox, Google Drive, and iCloud often allow you to store a certain amount of data for no charge. If you want to store more than the limit, you can subscribe to the service for an annual fee.

Step-by-Step 5.4

1. If necessary, insert a USB flash drive into a USB port on your computer. If a window opens displaying the contents of the USB flash drive or asking what you want to do when you insert the drive, close the window.
2. Click the **Show hidden icons** button on the taskbar to display icons for programs running in the background. See **Figure 5–38**.

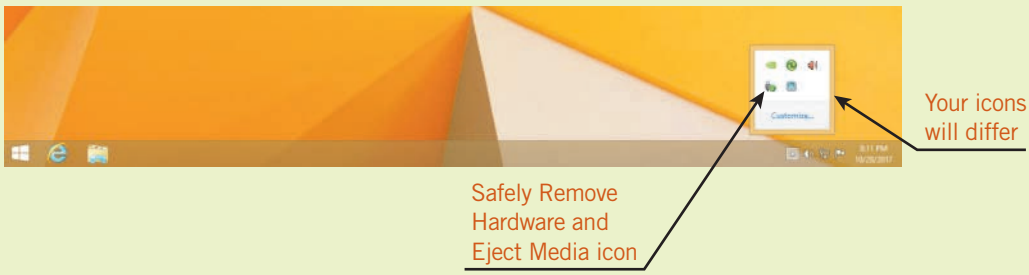


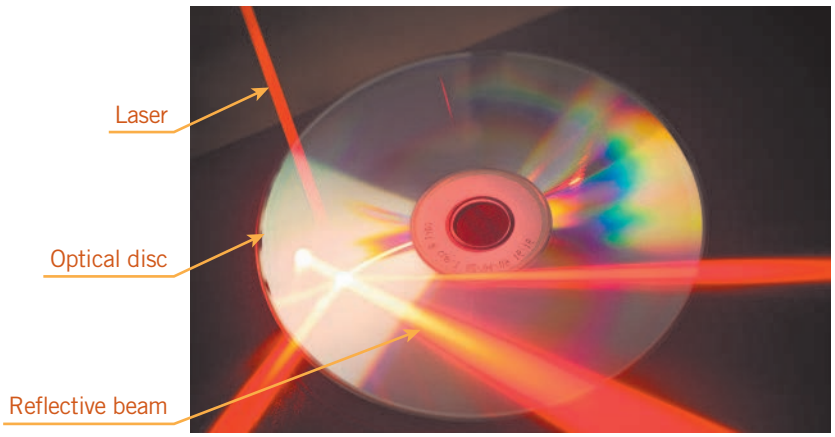
FIGURE 5–38 Safely removing a USB flash drive

3. Click the **Safely Remove Hardware and Eject Media** icon to display a list of devices you can detach from your computer.
4. Click the command for your USB flash drive, such as **Eject Removable Disk**.
5. When a "Safe to Remove Hardware" notification appears, remove the USB device from the USB port.

Optical Storage Devices

Optical storage devices use lasers to read and write data on plastic platters that contain a metal layer, which reflects the laser light back to a sensor in an optical drive. Desktop and laptop computers often have optical drives. See **Figure 5–39**.

VOCABULARY
optical storage device



© nikkytok/Shutterstock

FIGURE 5–39 Optical storage technology uses lasers

Optical media such as compact discs (CDs) and DVDs are called discs. The technology for storing data on CDs and DVDs is similar, though DVDs have much higher storage capacities. CDs were popularized as media for sound recordings, whereas DVDs are often used for software, video games, and movies. A more recent type of optical storage media is the Blu-ray disc (BD), which provides more than five times the storage capacity of a traditional DVD.

CDs, DVDs, and BDs are available in read-only memory (ROM), recordable (R), and rewritable (RW) formats. For example, a rewritable CD is noted as a CD-RW. In addition, CDs are produced in a digital audio (DA) format, also known as audio CDs, which is used for music publishing and distribution. You can only use optical discs in the RW format to store (or write) data multiple times. After information is written on an audio CD or any optical disc in the ROM or R format, it cannot be changed.

Table 5–2 shows the storage capacities of different types of optical discs. DVDs that can store data on one side only are called single-sided DVDs, whereas those that store data on both sides are called double-sided DVDs. Instead of using sides, Blu-ray discs use one or two layers of media on a single side of the disc.

TABLE 5–2 Storage capacities of optical discs

TYPE	CAPACITY
CD	740 MB
Single-sided DVD	4.7 GB
Double-sided DVD	9.4 GB
Single-layer Blu-ray disc	25 GB
Dual-layer Blu-ray disc	50 GB

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Optical discs are more durable and less susceptible to damage than magnetic storage media. However, although optical drives are fast enough to play movies, videos, and other data-intensive content, they are not fast enough to access data the way that hard drives do. Most optical drives can read and write data to both CDs and DVDs.

ABOVE AND BEYOND

Blu-ray disc drives use a blue-violet laser to read and write data, unlike earlier optical disc drives such as those for DVDs, which use a red laser. The blue laser makes it possible for the disc to store data at a greater density than a red laser, which is why Blu-ray discs have higher storage capacities though they are the same size as CDs and DVDs. Although they use different lasers, Blu-ray disc drives can generally read standard CDs and DVDs.



SUMMARY

In this lesson, you learned:

- Computers are binary machines, which means they understand two states: off (0) and on (1). The digits 0 and 1 are each called a bit. Eight bits grouped together make a byte. Data-measurement terms add a prefix to byte to indicate amounts. For example, "giga" means one billion, so a gigabyte is a billion bytes.
- To use peripheral devices with your computer, they must be connected to the computer in some way, which is the purpose of ports and expansion cards on the motherboard.
- A port is a connecter located on the system case that you use to plug peripheral devices into the computer. Inside the system unit, a port is attached to a bus, a sequence of electronic circuitry on the motherboard used to transfer data among computer components.
- Expansion cards can be plugged into expansion slots on the motherboard of a desktop or server computer. These cards expand the capabilities of the computer or let you attach a peripheral device. For the same purpose, mobile computers use ExpressCard modules and USB adapters, which are smaller than expansion cards and are plugged into slots or ports that you can access outside of the system unit.
- An input device is a peripheral device you use to enter data and commands into the computer. Typical input devices include keyboards, mice and other pointing devices, touchscreens, and microphones.
- The keyboard is the most common input device for entering text and numbers into a computer. Keyboards can be built into the computer, as they are in mobile computers, attached using a cable plugged into a USB port, or connected using a wireless connection. In addition, computers can use onscreen keyboards as input devices.
- The mouse is the most common type of pointing device, which is an input device you use to position the pointer on the screen. Popular types of mice include optical, wireless, and touch mice.
- Other types of pointing devices include touchpads, pointing sticks, and trackballs.
- Touchscreens have a touch-sensitive surface that overlays the screen display and responds to the electrical impulses in your fingertips. Touchscreens are popular because they let you interact with a computer without using an external input device.
- Many computers with touchscreens accept input from a stylus, which is a pen-like writing instrument. Other types of digital pens capture data as you write or draw on any surface.
- Audio input is speech, sound effects, and music entered into a computer. Audio input devices include microphones, portable music players, radios, and other hardware such as electronic piano keyboards.
- You use video input devices to enter still and moving images into a computer, often through a camera built into the computer.

- Specialized input devices include game controllers, scanners, and biometric security devices.
- Output is data processed into a useful format, such as printed text, spoken words, music, pictures, video, and graphics. Output devices include monitors, projectors, printers, and speakers.
- Desktop computers typically use a monitor as their display device. Mobile computers use integrated flat-panel screens usually called display screens.
- The amount of information a screen can display at one time is determined by its screen resolution, which is expressed as the number of horizontal pixels by the number of vertical pixels, as in 1366 × 768 screen resolution. The video card installed in your computer determines the resolutions available for your display screen.
- Display screens are measured diagonally from corner to corner. Size ranges include 17 to 30 inches for desktop computer monitors, 14 to 17 inches for laptop computer screens, and 7 to 10 inches for tablets.
- A projector, also called a data projector, is an output device that connects to a computer and projects images onto a wall screen or other large, flat surface.
- Printers produce a paper copy, or hard copy, of processing results, and are classified as nonimpact or impact printers. Most home and office computer users have nonimpact printers because they print faster and more quietly than impact printers and produce higher quality output.
- The two most popular types of printers are inkjet and laser printers, both types of nonimpact printers. An inkjet printer creates text and images by spraying ink onto paper. A laser printer produces text and images using the same technology as copier machines.
- Impact printers, which include the dot matrix and line printer, were the first type of printer developed for personal computing. Other types include thermal, mobile, label and postage, and plotters and large-format printers.
- Speakers, headphones, and earbuds are output devices that generate sound, such as music or speech.
- If you want to keep a permanent copy of the data you enter as input, you must save it on a storage medium, such as a disk or DVD.
- Storage media are contained in a storage device, which is the equipment that records and retrieves data from the storage medium. Storage devices include hard drives, CD/DVD drives, and USB flash drives.
- Storage technology refers to a storage device and the media it uses. Storage technologies include magnetic, optical, and solid-state technologies.
- Hard drives are the main storage devices in a computer. Most use magnetic storage technology to retain data. Because hard drives consist of platters that rotate as a read/write head moves to save or retrieve data, they are also considered mechanical storage devices.
- Solid-state drives use flash memory technology to store data as electrical rather than magnetic charges. Though they are more expensive, they offer advantages over hard drives because they have no moving parts, consume less power, generate less heat, and retrieve data more quickly.
- An external hard drive is a separate, freestanding high-capacity device that you attach to a computer, usually using a USB port.
- Removable drives such as memory cards and USB flash drives are ideal for transporting data from one computer to another, adding storage capacity to a computer, and securing data away from a computer.
- Optical storage devices use lasers to read and write data on plastic platters that contain a metal layer, which reflects the laser light back to a sensor in an optical drive. Optical media such as CDs and DVDs are called discs.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. A touchpad is a pointing device that works like a mouse with a ball on top of the device.

T F 2. Laser printers produce output using a powdered ink called toner.

T F 3. FireWire is a type of bus developed by Apple to connect multimedia devices to a computer.

T F 4. All hard drives use magnetic storage technology to retain data.

T F 5. The most popular technology for computer monitors is the digital light processing (DLP) technology.

MULTIPLE CHOICE

Select the best response for the following statements.

1. To connect a wireless mouse to a laptop computer, you might use a(n) _____.
   A. cable
   B. stylus
   C. expansion card
   D. USB adapter
2. A(n) _____ uses flash memory technology to store data as electrical rather than magnetic charges.
   A. optical drive
   B. solid-state drive
   C. Blu-ray disc
   D. mechanical hard drive
3. Because a(n) _____ is stationary, it is a good pointing device to use when you have limited desktop space.
   A. trackball
   B. optical mouse
   C. digital pen
   D. scanner
4. _____ screens manipulate light within a layer of liquid crystal cells to produce an image.
   A. USB
   B. RFID
   C. LCD
   D. LED
5. The smallest types of removable media are called _____.
   A. ExpressCard modules
   B. CD-Rs
   C. memory cards
   D. adapter cards

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. Why does a computer have different types of ports?

2. What advantage do ExpressCard modules and USB adapters offer over expansion cards?

3. When might you want to use an ergonomic keyboard?

4. Why do most laptop computers include a touchpad?

5. What is the purpose of audio input devices? Give three examples of audio input devices.

6. What is an RFID tag? How do you retrieve data from an RFID tag?

7. Describe the difference between a high screen resolution such as 1600 × 900 and a low-screen resolution such as 1024 × 768.

8. Explain in general how an inkjet printer produces text and images. Why is an inkjet printer considered a nonimpact printer?

9. What is the difference between storage media and storage devices?

10. In what two ways can you measure hard drive speed? Explain each of these measurements.

11. Why are optical storage media considered better than magnetic storage media?

PROJECTS

PROJECT 5–1

In this project, you open the Sound dialog box to examine settings for audio input and output devices. You take screenshots as you use the Sound dialog box. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. Open the Control Panel, click the **Hardware and Sound** category, and then click the **Sound** category to open the Sound dialog box.
2. Click the **Playback** tab, if necessary, and then click a device listed on this tab.
3. Click the **Configure** button to display a setup dialog box. If possible, test the device using the dialog box. For example, if you selected speakers on the Playback tab, you can click the **Test** button to make sure both speakers are playing sound.
4. Arrange the setup dialog box and the Sound dialog box side by side, and then press the **Print Screen** key to capture an image of the dialog boxes. Save the image as a Paint file named **Playback Setup**.
5. Click the **Cancel** button to close the setup dialog box.
6. In the Sound dialog box, click the **Recording** tab, and then click a device listed on this tab.



1-2.1.1

7. Click the **Properties** button to open the Properties dialog box for this device.
8. Explore the tabs in the Properties dialog box to find a setting you can use to control the microphone volume.
9. When you find the microphone volume setting, arrange the Properties dialog box and the Sound dialog box side by side, and then press the **Print Screen** key to capture an image of the dialog boxes. Save the image as a Paint file named **Microphone Volume**.
10. Click the **Cancel** button to close the Properties dialog box, and then click the **Cancel** button to close the Sound dialog box.

PROJECT 5–2



1-2.1.1

In this project, you explore the Hardware and Sound category in the Control Panel to learn about ways to control the hardware on your system. You take screenshots as you explore. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests. Some steps require you to perform new tasks or solve problems independently.

1. Open the Control Panel, and then click the **Hardware and Sound** category, if necessary.
2. Find a setting that lets you calibrate color on your display, which means to reflect colors accurately on your monitor. Open the Welcome to Display Color Calibration window. Press the **Print Screen** key to capture an image of the desktop, and then save the image as a Paint file named **Calibrate**.
3. Find a window that lets you select settings to play a DVD containing a movie as soon as you insert the DVD into a drive. Press the **Print Screen** key to capture an image of the window, and then save the image as a Paint file named **Play DVDs**.
4. Find a window that lets you control any other device in your computer or attached to it. Press the **Print Screen** key to capture an image of the window, and then save the image as a Paint file named **Device Control**.
5. Close all open windows.

PROJECT 5–3



1-2.1.1

In this project, you use the Microsoft Web site and Windows Help and Support to learn more about USB devices and printers, and then answer questions about what you learned. Submit the written answers as your instructor requests.

1. Use a browser to go to http://windows.microsoft.com, click the **How-to** link, and then search for information about USB devices.
2. Answer the following questions:
   - What other name does Windows Help and Support use for the USB 3.0 technology?
   - How can you tell if a USB device uses USB 3.0 technology?
   - How can you remove a USB device using the PC Settings screen?
3. In Windows Help and Support, search for information about printers, and then answer the following questions:
   - What is a default printer?
   - How do you set the default printer?
   - What can you do if you see a yellow warning icon next to a printer displayed in the Devices and Printers window?
4. Close all open windows.

TEAMWORK PROJECT

1-2.1.2

You work for an online magazine that generates hundreds of files per week that need to be stored for safekeeping. Your manager does not want to store the files on the internal hard drive of one of the magazine's computers. Instead, she wants to store them offsite on some type of removable media, such as DVDs, USB flash drives, or external hard drives. Her primary concern is the cost of storage. She asks you and two team members to help her research these options. Work as a team of three to complete the following steps.

1. Assign each of the following storage media to a team member: DVDs, USB flash drives, and external hard drives.
2. Use the Internet and other resources to research the cost to store 1 GB of data on the following media:
   - 4.7 GB DVD-R
   - 25 GB Blu-ray disc
   - 8 GB USB flash drive
   - 16 GB USB flash drive
   - 500 GB portable external hard drive
   - 1 TB desktop external hard drive
3. Collaborate as a team to create a table summarizing your findings for the 6 examples of storage media. Submit the document as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 5–1

1-2.1.1

Printers need to be maintained to run properly. What types of maintenance tasks should you perform for your computer? Complete the following steps.

1. Research printer maintenance on at least one Web site to find instructions or tips on maintaining the type of printer you have or use regularly.
2. As you research, identify periodic (once a month, for example) and occasional maintenance tasks.
3. Note any hazards or cautions you should observe when maintaining a printer.
4. Summarize the maintenance routine and cautions in a one-page explanation.
5. Submit your findings as your instructor requests.

CRITICAL THINKING 5–2

1-2.1.1

Electronic waste, or e-waste, is the waste produced from the discarded hardware components of computers and other electronic devices. E-waste is a growing problem. At the forefront of tackling this problem are cities, towns, and other municipalities that collect and recycle waste. What is your city or town doing to combat e-waste? Complete the following.

1. Using online and other sources, research the resources in your city or town for discarding e-waste.
2. In addition, research the particular problems associated with disposing of computer hardware. Also research the possible solutions.
3. Create a table that lists at least three problems and then suggest at least one solution for each problem.
4. Submit the table as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 5–1

As mentioned in this lesson, touchscreen technology has been evolving since the 1960s. Research the history of touchscreens on at least two Web sites and then answer the following questions. Submit the written answers as your instructor requests.

1. Who invented the first multitouch device? What are the basics of how it works?
2. In 1998, what event significant to touchscreen technology occurred involving a company named FingerWorks?
3. What device did Apple release before the iPhone that had touchscreen features?
4. What is the PortfolioWall? How much did it cost to set up the PortfolioWall?
5. What is significant about a touch-sensitive product called SmartSkin?

ONLINE DISCOVERY 5–2

No data storage technology is perfect—they each have their pros and cons as you saw in this lesson. What kind of technology will dominate in the future? Research the future of data storage on at least two Web sites, and then answer the following questions. Submit the written answers as your instructor requests.

1. Why is DNA being considered as a possible storage medium?
2. What type of data did researchers store using DNA as the storage technology?
3. What is a holographic drive? How much data can they store compared to a Blu-ray disc?
4. What advantages do new types of data storage cassette tapes offer over mechanical hard drives?
5. What advantages do crystal discs offer over other types of data storage media?

JOB SKILLS

Computer hardware problems can be some of the most frustrating problems faced by people in the workforce. You can increase your value to an organization by applying basic problem-solving skills to hardware problems. Complete the following steps.

1. Research *problem-solving steps* on at least three Web sites.
2. Apply these steps to explain how you would troubleshoot one of the following hardware problems to find a solution:
   - You choose to print a document, but the printer does not produce the document.
   - You attach an external hard drive to a USB port, but you cannot access the drive to save files on it.
   - You plug a headphone into an audio jack on your computer, but you do not hear any sound in the headphone.
3. Submit your steps to your instructor as requested.

EXPLORE AND SOLVE

Did you know?

- You can use the System Information window to display a complete list of input, output, and storage devices on your computer.
- Access system information to troubleshoot hardware problems and work with technical support.

1. Open the Control Panel, click the **System and Security** category, and then click **Administrative Tools** to display advanced tools for maintaining your computer.
2. Double-click the **System Information** tool to open the System Information window.
3. In the left pane, expand the **Components** category. Click an item in the left pane, such as CD-ROM, to view details in the right pane. As you explore the hardware on your computer, answer the following questions:
   - What type of optical disc (listed as "CD-ROM") do you have? What is its transfer rate?
   - What type of sound device is installed on your computer? Who manufactured the sound device?
   - What is the adapter description listed for your screen display?
   - What is the name given for your keyboard? What is the type given for your pointing device?
   - How many drives does your computer have for storage media? List the drives by letter and description.
4. Close all open windows, and then submit the document as your instructor requests.



Estimated Time:
1.5 hours

LESSON 6

Classifying and Evaluating Computers

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Identify types of personal computers.
- Describe desktop computers.
- Compare laptops and tablets.
- Evaluate smartphones.
- Describe embedded computers.
- Describe servers and other large computers.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

all-in-one desktop
convertible tablet
desktop computer
e-book reader
electronic paper display
embedded computer
enterprise server
file server
handheld game device
laptop computer
mainframe computer
netbook computer
network adapter
notebook
personal computer (PC)
portable media player
scalability
supercomputer
tower
ultrabook
Web server

Microsoft product screenshots used with permission from Microsoft Corporation.

At some point, you will likely find yourself in the market for a new computer. What type of computer should you buy? What features are the most important? Which performance measures matter the most? This lesson helps to answer those questions. It begins by surveying types of personal computers, which is the type you are most likely to buy. It also compares tablets and laptops in depth, and explains how to evaluate smartphones. It also discusses embedded computers, and explains the difference among servers, mainframes, and supercomputers.



1-2.3.2

Preparing to Purchase a Computer

Although thousands of models of computers are available today, they can all be organized into three categories: personal computers, embedded computers that are built into other machines (such as an ATM), and large computers such as servers. Unless you are building a network for a company or performing intensive physics calculations, you will be considering a personal computer for purchase. A ***personal computer (PC)*** is a computing device that can perform input, processing, output, and storage activities on its own and is designed to be used by one person at a time.

VOCABULARY
personal computer (PC)

The personal computer you decide to buy depends on how you plan to use it, your budget, and its value, which is the quality of the computer's features, construction, and components compared to the price. Computer usage is one of the most important factors in a decision to purchase a computer, and typically falls into the following ranges:

- *Basic*—You plan to use the computer occasionally to perform tasks such as visiting Web sites, exchanging e-mail, and creating word-processing documents.
- *Intermediate*—You plan to use the computer frequently to perform a variety of tasks, including playing games, watching videos, shopping online, and using productivity software for word processing, financial tracking, personal information management, graphic design, and other work-oriented or creative endeavors.
- *Advanced*—You plan to use the computer to perform tasks that require the maximum (or near maximum) amounts available in processing speed, memory usage, or storage capacity, such as playing graphics-intensive games that demand a lot of processing power, watching high-definition movies online, or producing many large files, such as those containing photos or videos.

The quality of a computer is determined primarily by the performance of its system components. As you shop for computers online or in a retail store, compare the system component features described in **Table 6–1**. These components are most often noted in computer ads and in-store labeling of the computer products. Processors and RAM are discussed in detail in Lesson 2. Storage devices are discussed in Lesson 5. Recall that the processor and RAM affect computer performance the most, with the processor determining how fast a computer can work and RAM determining how efficiently the computer can provide data to the processor.

TABLE 6–1 Evaluating system components and features in a personal computer

COMPONENT OR FEATURE	DESCRIPTION	MEASURED IN	HOW TO EVALUATE
Processing capacity	Bit size of the CPU	bits	32-bit CPUs can work with up to 4 GB of RAM; 64-bit CPUs can work with an almost unlimited amount of RAM, which increases efficiency.
Processing speed	Clock speed of the CPU	gigahertz (GHz)	The higher the processing speed, the better the overall performance.
Memory capacity	Amount of RAM	gigabytes (GB)	Purchase as much RAM as you can afford and the CPU can handle.
Memory speed	Access speed	megahertz (MHz)	The higher the access speed, the more efficiently the CPU can process data.
Storage capacity	Amount of data the hard drive can store	gigabytes (GB) and terabytes (TB)	Double the amount of storage you estimate you need for software and data; full hard drives slow computer performance.
Storage speed	Access time	milliseconds (ms)	Affects how efficiently applications open.
	Read/write speed	revolutions per minute (RPM)	

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When considering a personal computer to purchase, you can select from four major types. In largest to smallest order, these are desktop computers, laptops, tablets, and smartphones, and they are discussed in detail in the following sections.

1-2.2.2
1-2.3.1

VOCABULARY
desktop computer
tower
all-in-one desktop

Desktop Computers

A ***desktop computer*** is a computer that fits on or next to a desk, is designed to be stationary, and runs on power from a wall outlet. With a traditional desktop computer, the system unit, monitor, keyboard, and pointing devices are separate pieces of hardware. The system unit containing the processing components is called a ***tower***, which usually stands vertically on the floor. Some cases are designed to sit horizontally on a desktop, under the monitor. See **Figure 6–1**.



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FIGURE 6–1 Desktop computer

The traditional desktop computer has been popular in offices, schools, and homes because it is economical and durable. A typical price for a basic desktop computer adequate for basic computing tasks is around $400. As you increase processing power, RAM, and hard drive capacity, the price also increases to as much as $1,200.

A recently developed type of desktop computer is called an ***all-in-one desktop***, which houses the processing components in the same case that holds the monitor; there is no tower. As shown in **Figure 6–2**, the Apple iMac is an all-in-one desktop.



© iStockphoto/Eric Kalitov

FIGURE 6–2 All-in-one desktop

Because they take up less space than a traditional desktop computer, all-in-one desktops are a good choice for home computers. They also start around $400, and will increase in price with increased processing and storage capacity or advanced peripherals. For example, an all-in-one desktop with a touchscreen is around $600.

Computer enthusiasts who plan to expand or upgrade their systems often choose traditional desktop computers rather than all-in-one desktops. It is easier to remove part of a tower's system case to get inside and install additional RAM, swap an older video card for a new one, or set up an extra hard drive than it is to upgrade an all-in-one desktop. In fact, all-in-one desktops typically have little room for hardware expansion.

Traditional desktop computers can also perform more quickly and reliably than all-in-one desktops. Because all-in-one desktops have a limited amount of space for system components, they must use components that are small and generate little heat, which are usually less powerful than traditional desktop components.

On the other hand, all-in-one desktops are more compact than traditional desktop computers, can be moved more easily, often include touchscreens, and have a sleek, attractive style.

In summary, if you are looking for a powerful, inexpensive desktop computer you can upgrade easily, consider a traditional desktop computer. If you are willing to pay slightly more for style and compactness, and plan to do average types of computing tasks, consider an all-in-one computer.

ABOVE AND BEYOND

Most computer historians consider the Osborne 1 to be the first truly portable computer. Developed by Adam Osborne and released in 1981, the Osborne 1 weighed 24 pounds, cost around $1800, and was about the size of a sewing machine with a 5-inch screen. The term "laptop" was not applied to computers until a few years later, when manufacturers designed and released smaller machines that opened like a clamshell to reveal larger screens with resolutions similar to desktop computers of the time. By the mid-1990s, laptops were common in workplaces and homes.

Laptop Computers

IC3
1-2.2.3
1-2.3.1

A ***laptop computer*** (sometimes called a ***notebook***) is a lightweight mobile computer about the size of a paper notebook that includes the system components, keyboard, pointing device, and display screen in a single unit. Laptops use a battery as a power source, though you can also plug them into a wall output to recharge the battery and to power the computer. Many personal computer users prefer laptops to desktop computers because laptops are easy to carry and move, use less energy, and can fit almost anywhere, including on a user's lap. In addition, you can use laptops without cables for power or peripheral devices, which reduces clutter. Laptops are especially popular with students and mobile workers such as salespeople who can take their computers with them to classes, the library, meetings, and other out-of-office activities. See **Figure 6–3**.

VOCABULARY

laptop computer

notebook



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FIGURE 6–3 Students using a laptop in the library

ABOVE AND BEYOND

According to Gartner Research, sales of standard laptop computers more than quadrupled from 2003 to 2013, indicating their popularity, while sales of desktop computers declined by almost 50 percent. However, sales of netbook computers also decreased while sales of tablet computers increased, which seems to indicate a general trend toward tablet computers.

Today's laptops have as much computing power and perform as well as most desktop computers because laptops can include top-notch processors and large amounts of RAM and hard disk storage capacity. As with desktop computers, prices for laptops start around $400 and increase as you add processing power, memory, and storage space. However, because it costs more to produce components that fit a laptop's compact design, laptops are slightly more expensive than desktop computers with the same power, speed, and storage capacity.

VOCABULARY
netbook computer
ultrabook
convertible tablet

Netbook computers (also called ***ultrabooks***) look like laptops but are smaller (about 11 × 8.5 inches rather than 15 × 10 inches) and lighter (about 3 pounds rather than 5 pounds). Netbook computers have less power and storage capacity, lack a CD/DVD drive, and provide a smaller keyboard and display screen than laptops, but include batteries that hold a charge longer. Netbooks are suitable for mobile users who access the Internet frequently or for long periods and don't need to store a lot of data or software on a hard drive.

If mobility is important to you and you use a computer to perform basic to advanced productivity tasks (those where you produce a report or presentation, for example), you should choose a standard laptop as your computing device.

1-2.2.4

Tablet Computers

Recall that a tablet computer is a one-piece handheld computer that typically includes a touchscreen. Like laptops, tablets run on battery power and can be plugged into a wall outlet as necessary. True tablets use a slate design; they are rigid and do not fold. ***Convertible tablets*** use a hybrid design that includes a swivel screen or removable keyboard so you can use the computer as a laptop or tablet. See **Figure 6–4**.



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FIGURE 6–4 Slate and convertible tablets

1-2.3.1

Comparing Tablets and Laptops

For many people considering a new computer, the choice is between a tablet and a laptop. Both are mobile computers developed by a number of computer manufacturers, making it likely that you can find one with a combination of features and price that suits your needs. To compare tablets and laptops in general, consider their input devices, battery life, storage capacity, performance, physical factors, and price as well as your computer usage:

- *Input devices*—A laptop provides a physical keyboard and pointing device, whereas a tablet using a slate design has a virtual keyboard and touchscreen. See **Figure 6–5**. Many people find virtual keyboards that are controlled by touch less responsive than physical ones and more awkward to use for extended typing. On the other hand, touchscreens are a natural interface, especially for new users and for tasks that don't involve typing or working with small, detailed objects.



© iStockphoto/Erik Khalitov

FIGURE 6–5 Virtual keyboard on a tablet

- *Battery life*—You can be on the move with a mobile computer only as long as your battery holds out. Because tablet hardware requires less power than laptops, tablets can run on battery power much longer than laptops can. For example, the average tablet can run at least 8 hours on battery power, while the average laptop can run only for 3–4 hours.
- *Storage capacity*—Tablets use solid-state drives to store data, with capacities of 16 to 64 GB. In addition, some tablets include slots for microSD cards that can hold up to 64 GB of data. Most laptops have mechanical hard drives that can store hundreds of gigabytes, with some laptops providing 1 TB of storage. Overall, although tablet storage devices can access data quickly and require less power than laptops, they offer limited storage capacities.
- *Performance*—Most tablets use low-power dual-core processors, so their performance lags behind that of a laptop, which can use quad-core processors. In addition, tablets typically have 1–2 GB of RAM, whereas laptops often have much more. If you use a computer only for basic tasks, however, you are not likely to notice a difference in performance between a laptop and a tablet.
- *Physical factors*—If you plan to carry the computer for a long time or over great distances, size and weight are important factors. Tablets are smaller than laptops, ranging from about 7 to 10 inches diagonally. They also weigh less, around 1 pound on average, while laptops range from 2 to 5 pounds. Keep in mind that tablets are smaller and lighter than laptops because they have less hardware, such as no CD/DVD drive or physical keyboard, which might affect how you use the computer.
- *Price*—As a relatively new technology, entry-level tablet computers are more expensive (about $500) than entry-level laptops. Considering that the processor and main storage device are two of the most expensive components in a computer, a laptop computer is the best value, since it provides better components at a lower price.
- *Computer usage*—Computer usage is probably the deciding factor for most people choosing between a tablet and a laptop. Because of their physical keyboards, storage capacities, and processors, laptops are well-suited to productivity tasks. Because of their size, weight, and battery life, tablets are ideal for consumption tasks, such as watching videos, visiting Web sites, checking e-mail, and playing games, especially on the go.

1-2.2.5

Smartphones

Recall that a smartphone is a cell phone that includes many features of a computer, allowing it to run general-purpose computing applications. Smartphones connect wirelessly to the Internet; include built-in cameras, music players, and global positioning systems (GPSs); and let you send and receive phone calls, e-mail messages, and text messages.

Many smartphones have touchscreens, though some include a small keyboard below the display screen or one that slides out from behind the display screen. See **Figure 6–6**.



Smartphone with a touchscreen
© iStockphoto/Moncherie



Smartphone with a built-in keyboard
© iStockphoto/serts



Smartphone with a slide-out keyboard
© Oleksiy Mark/Shutterstock

FIGURE 6–6 Smartphones

The main advantage smartphones offer over other mobile computing devices is communication. As a type of cell phone, the smartphone was originally designed for making and receiving voice calls. Tools and features on a smartphone support phone calls. For example, smartphones include a small microphone and speaker for voice calls and a camera for video calls.

1-2.3.1

Evaluating Smartphones

To evaluate smartphones, you can use the same set of criteria you used to compare laptops and tablets—input devices, battery life, storage capacity, performance, physical factors, price, and computer usage:

- *Input devices*—The physical keyboards provided with some smartphones are small, designed for typing short phrases used in Internet search text and electronic messages. Touchscreens are more common and easier to use.
- *Battery life*—Battery usage on smartphones varies significantly depending on your activities. Accessing the Internet, for example, uses more battery power than having a phone conversation. When you're evaluating smartphones, look for information about the call time or talk time battery capacity, which ranges from 7 to 17 hours in current smartphones; Internet use battery capacity, which ranges from about 4 to almost 7 hours; and charging time, which ranges from around 2 to 4 hours.
- *Storage capacity*—Similar to tablets, smartphones use solid-state drives to store data, with capacities of 16–64 GB. In addition, smartphones from some manufacturers such as Samsung and BlackBerry include slots for microSD cards that can hold up to 64 GB of data.
- *Performance*—Smartphones pack a lot of processing power into small space, with most models boasting multicore processors and 2 GB of RAM that can handle most smartphone tasks with efficiency. These performance features let you multitask as much as the operating system allows. On many smartphones, for example, you can use a mapping application to display directions to a restaurant as you call to make a dinner reservation.

- *Physical factors*—Smartphones are designed to be carried for long periods, so they are lightweight, about 4–6 oz. Their screens are much smaller than tablet screens, usually around 5 inches measured diagonally, though some approach 7 inches. To compensate for small screens, smartphones increase the screen resolution, which is measured in pixels per inch (ppi). Resolutions higher than 300 ppi produce sharp, crisp images and easy-to-read text.
- *Price*—Prices for smartphones have been falling recently, with an average price of around $300 expected in 2017, according to technology market-research firm International Data Corp. Because most Americans now own smartphones (56% overall, and 80% of people ages 18–24, according to a recent Pew Research Center report), smartphone manufacturers must compete on price as well as other factors to win new customers and retain current ones.
- *Computer usage*—If you use a computer only to access the Internet and communicate with others, a smartphone might be the only computing device you need. Software for smartphones is limited by screen size and RAM, and includes accessory applications such as a calendar and contact manager. If you need to use more productive or full-featured software, purchase a smartphone as a supplement to another personal computer.

QUICK TIP

Smartphones with screens larger than 5 inches are called *phablets*, a combination of phones and tablets.

Other Mobile Devices

IC3 1-2.2.6

Mobile devices besides laptops, tablets, and smartphones include electronic book (e-book) readers, portable media players, and handheld game devices. See **Figure 6–7**.



E-book reader
© iStockphoto/mphillips007



Portable music player
© iStockphoto/jericho667



Handheld game device
© iStockphoto/pagadesign

FIGURE 6–7 Other mobile devices

Many of these mobile devices provide wireless connections to the Internet, but do not include other features or capabilities that mobile computers have. For example, you cannot install productivity applications or other software on a handheld game device. Instead, each of these devices is dedicated to a particular purpose, and only lets you perform tasks related to that purpose. Features of these other mobile devices include the following:

QUICK TIP

You can also download and read digital books, magazines, and newspapers on mobile computers such as tablets.

- *E-book readers*—You use an ***e-book reader*** (also called an *e-reader*) to download and read electronic versions of printed books, magazines, and newspapers. Most e-book readers have touchscreens, though some have buttons and a small touchpad you use to navigate digital media. E-book readers are usually smaller than a tablet, but larger than a smartphone, and include a hard drive with up to 4 GB of storage. Another notable difference is that instead of using LCD screens, e-book readers use ***electronic paper displays***, which consume less power and provide higher contrast in bright lighting than LCDs. Many e-book readers also offer backlights to improve readability when the light is low.

VOCABULARY

e-book reader

electronic paper display

VOCABULARY

portable media player

handheld game device

QUICK TIP

Tablets and smartphones are usually sold with applications that let you download and play media files such as songs and videos.

- *Portable media players*—A ***portable media player*** is a mobile device that can store digital media such as songs, videos, and photos, typically on a small hard drive. Portable media players are also called MP3 players, a term that refers to the MP3 file format used for many digital audio files. However, some portable media players, such as the iPod, also play audio files in other formats.

  Most portable media players are smaller than a smartphone, though one, the iPod Touch, is the same size as the iPhone. Many portable media players include wireless connections to the Internet so you can download audio, video, and other files easily; otherwise, you transfer digital media from a computer to the device, which includes a hard drive or flash drive for storage (typically up to 64 GB).
- *Handheld game device*—A ***handheld game device*** is a mobile device designed for a single video game player to use at one time. Many handheld game devices can connect to the Internet and to other game devices so that the user can play against others who are using their game device at the same time. About the size of a smartphone, these devices include built-in screens, speakers, batteries, and controls in one unit. The screens are smaller than those on a smartphone to provide room for the game controls. Recent models provide touchscreens and up to 16 GB of data storage.

QUICK TIP

On a personal computer, you can visit an online store to download games in categories such as action and adventure, puzzle, strategy, and sports.

To prepare for purchasing a personal computer and to learn about the capabilities of computing devices available today, your best resource is the Internet. In Step-by-Step 6.1, you use a Web browser to visit the Apple Web site, and then review the desktop computers, laptops, tablets, smartphones, and other mobile devices that Apple offers. You also compare the features and specifications of each device. If you were reviewing these computers for purchase, you would need to consider your computer usage and budget to determine whether any of the devices were right for you. As you perform the steps, keep in mind that Web pages change frequently, so the images and information you see on the Apple Web site might differ from the figures shown in this Step-by-Step.

Step-by-Step 6.1

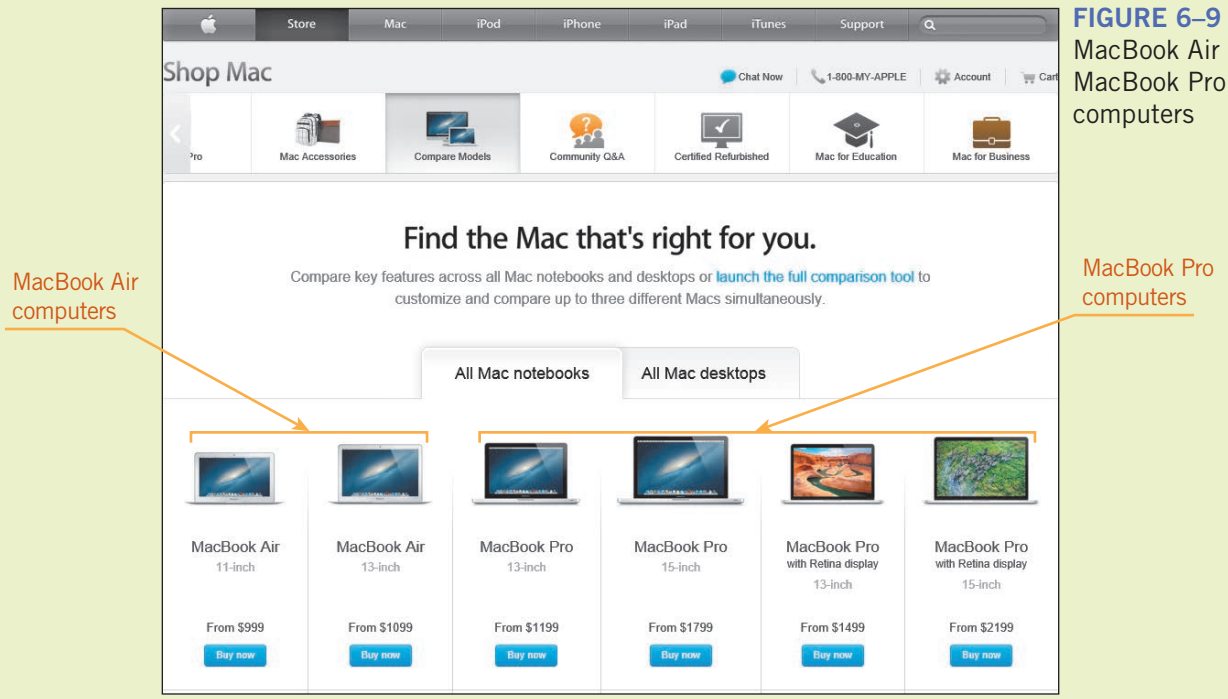
1. On the Start screen, click the **Internet Explorer** tile to start Internet Explorer.
2. Click in the Address box at the bottom of the screen, type **www.apple.com**, and then press the **Enter** key to open the Apple home page.
3. On the navigation bar at the top of the home page, click the **Store** button to display the Apple Store Web page. See **Figure 6–8**.



Courtesy of Apple Computers

FIGURE 6–8
Apple Store Web page

4. Click **Shop Mac** to display the desktop and laptop computers that Apple offers.
5. Scroll the Shop Mac bar of options to the right, and then click **Compare Models** to display information about MacBook Air and MacBook Pro computers. See **Figure 6–9**.



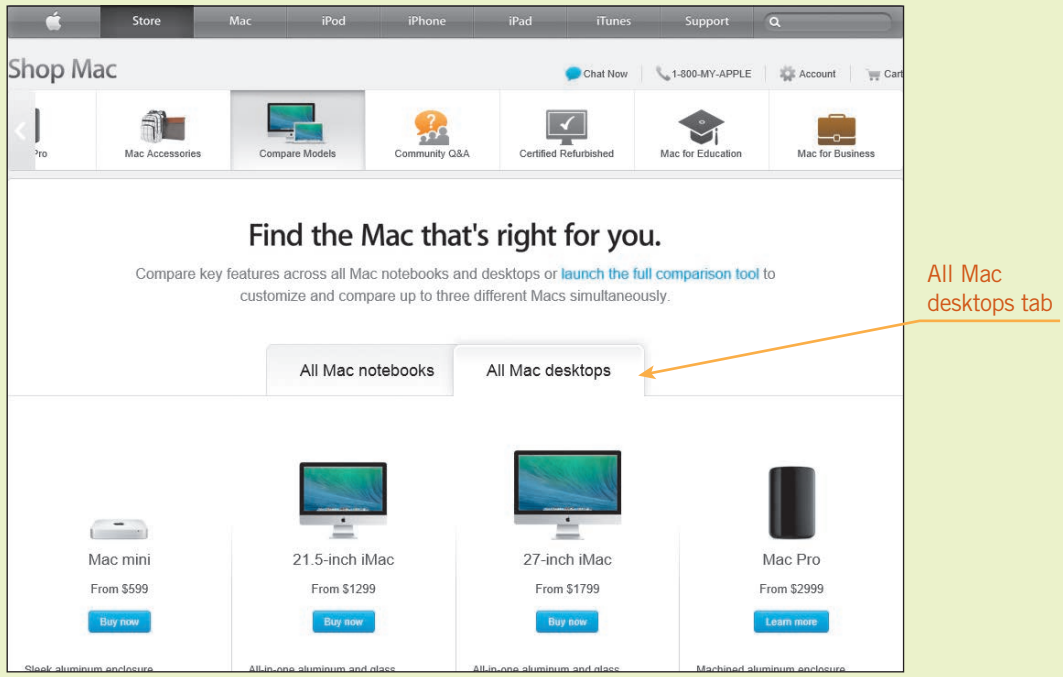
Courtesy of Apple Computer

FIGURE 6–9
MacBook Air and MacBook Pro computers

6. Scroll down the page to view the details for each model, organized by specifications, display, battery, and other features. MacBook Air computers can be classified as netbooks because of their size, while MacBook Pro computers are laptops. For each model, you can compare screen size, processor speed, memory (RAM), and storage capacity. As these specifications increase, so does the price.

7. Note the processor speed and type, the storage capacity, and the price of the 15-inch MacBook Pro, and then click the **All Mac desktops** tab at the top of the page to display information about Mac desktop computers. See **Figure 6–10**.

FIGURE 6–10
Mac desktops

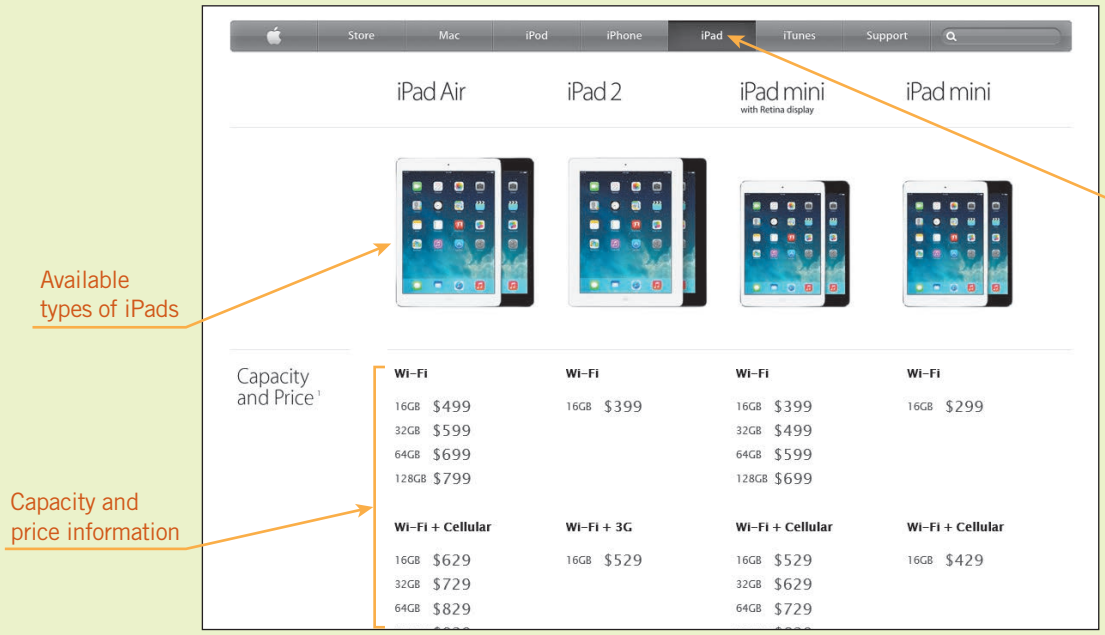


Courtesy of Apple Computer

The Mac mini and Mac Pro are offered as towers; you can add a monitor, keyboard, mouse, and other peripherals to create a complete system. The iMacs are all-in-one desktops.

8. Review the specifications and price for the 27-inch iMac, which is about the same price as the 15-inch MacBook Pro. Besides the larger screen, the iMac also has a faster processor than a MacBook Pro, but is not a mobile computer.

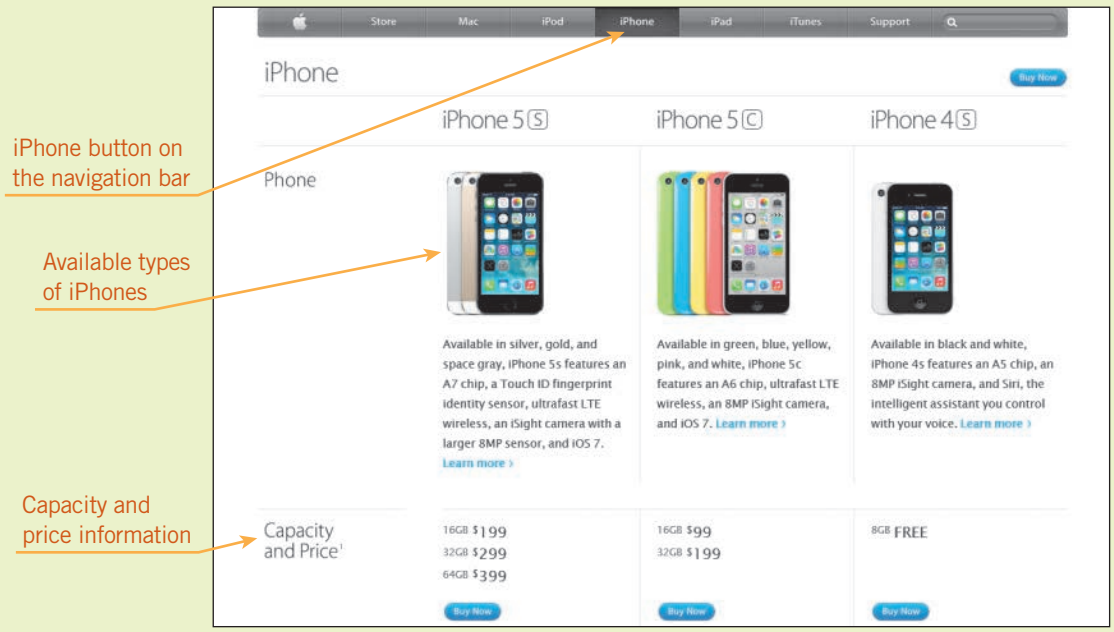
9. On the navigation bar at the top of the page, click the **iPad** button to display information about iPads, which are tablet computers. Click **Compare iPad models** to display current models of iPads. See **Figure 6–11**.



Courtesy of Apple Computer

FIGURE 6–11
iPads

10. Scroll to display information about the capacity and price of each model. Note that these specifications are different from the ones shown for Mac laptops and desktops, and emphasize features important to tablet users, such as dimensions and weight.
11. Note the capacity, price, and chip type for one of the iPad models. On the navigation bar at the top of the page, click **iPhone** to display information about iPhones, which are smartphones.
12. Click **Compare iPhone Models** to display descriptions and specifications for iPhone models. See **Figure 6–12**.

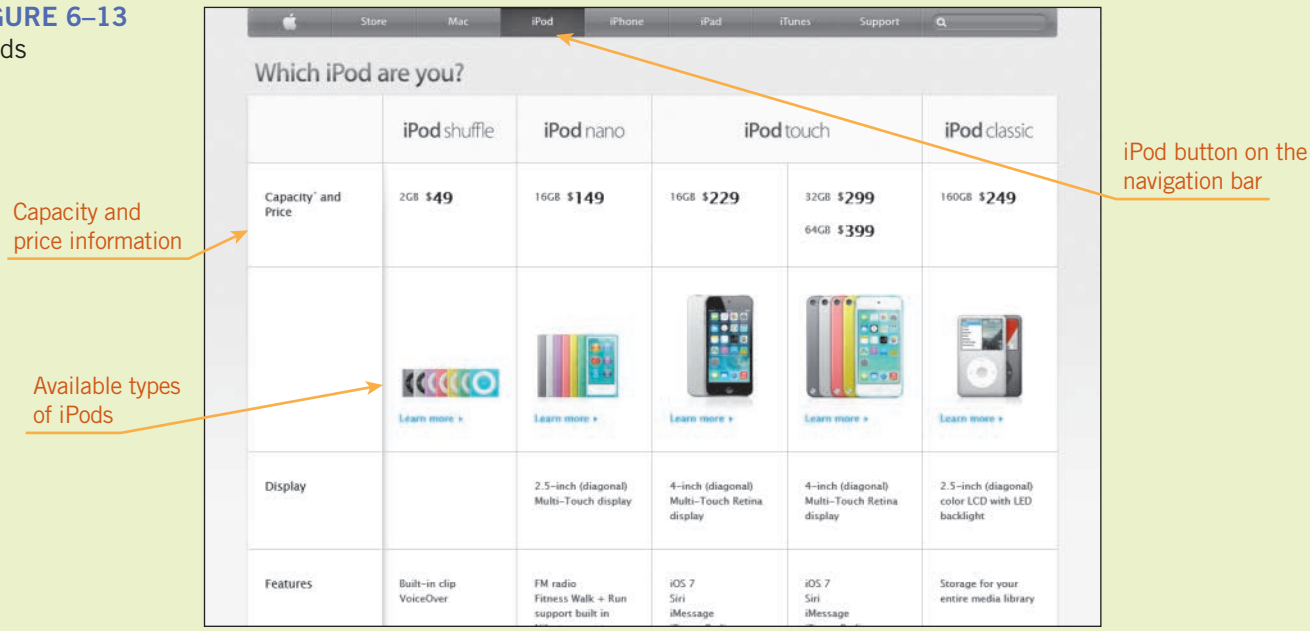


Courtesy of Apple Computer

FIGURE 6–12
iPhones

13. Review the specifications and prices of the iPhones and compare them to the iPads. In some cases, the iPhone has the same storage capacity and a better chip for the same price as an iPad. The screen size of an iPad is much larger, making the tablet more expensive.
14. On the navigation bar at the top of the page, click **iPod** to display information about iPods, which are portable media players.
15. Scroll as necessary to locate and then click **Compare iPod models** to display specifications for iPods. See **Figure 6–13**.

FIGURE 6–13
iPods



Courtesy of Apple Computer

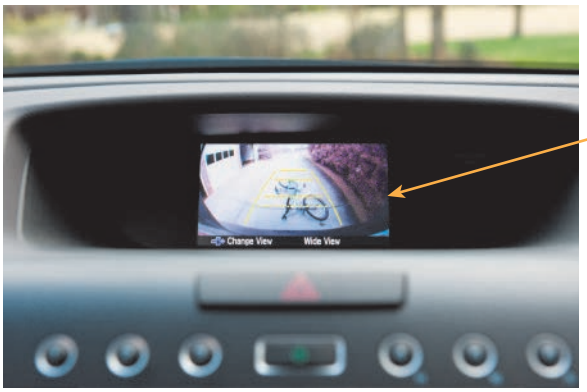
Note that the iPod touch models are similar to iPhones in terms of price, size, and weight.

16. Press the **Alt+F4** keys to close Internet Explorer.

Understanding Embedded Computers

VOCABULARY
embedded computer

An ***embedded computer*** is a processor built into a household appliance or other device such as an ATM, navigation system, refrigerator, television, or other consumer electronics. The appeal and strength of an embedded computer are that it adds computing power to a device without needing intervention from a user. For example, a washing machine with an embedded computer can use power and water more efficiently than one without an embedded computer. Cars use many embedded computers. Features such as sensing when your car moves out of its lane or when a person or object is blocking your path as you back up are controlled by embedded computers. See **Figure 6–14**.



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FIGURE 6–14 Embedded computer in a car

Recall from Lesson 1 that embedded computers have embedded operating systems. In some cases, such as a cell phone, the embedded operating system evolved into a mobile operating system as developers added features that allowed the operating system to perform more tasks. In a similar way, embedded computers have evolved into mobile computing devices. For example, early portable media players used embedded computers to manage songs. They accepted input from users regarding which songs to play and in what order. The embedded computer stored the selections in memory. When a song finished playing, the embedded computer sent a signal to play the next song in the playlist and displayed the name and length of the song. As developers added features to portable media players that allow users to perform multipurpose tasks such as connecting to the Internet and capturing and playing videos, they became mobile computing devices.

ABOVE AND BEYOND

A *video game console* is an electronic device about the size of a dictionary that you attach to a TV or monitor to play games. Xbox and PlayStation are examples of video game consoles, which contain embedded computers and are dedicated to running game software. Video game consoles are larger versions of handheld game devices and easily allow more than one person to play at the same time. Although many video game consoles have midrange CPUs, can connect to the Internet, and use optical media such as DVDs, they are not a substitute for a personal computer, which you can use to perform a wide range of tasks.

Understanding Servers and Other Large Computers

IC3 1-2.2.1

Although you would not buy a server for personal use, you should know about their capabilities because they play a role in everyday life, allowing you to access the Internet, exchange e-mail, and download and store files, for example. See **Figure 6–15**.



Internet access
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© iStockphoto/Pavlinec

File downloads
© kangshutters/Shutterstock

E-mail
© vinzstudio/Shutterstock

FIGURE 6–15 Servers in daily life

You indirectly encounter other types of large computers, including mainframes and supercomputers, in your daily life. For example, people who work for banks use mainframe computers to process financial transactions, including those for credit card purchases you make at stores and online. To bring you up-to-date weather forecasts, meteorologists access information provided by supercomputers.

Servers, mainframes, and supercomputers are large computers because they are designed for use by more than one person, up to tens of thousands of people in many cases. To support that many users, large computers need much more processing power, memory, and storage capacity than personal computers.

Servers

Recall from Lesson 2 that a server is a computer that provides network services such as e-mail to client computers. Some servers look similar to the tower used with desktop computers, while others look like racks containing cases of storage media. See **Figure 6–16**.



Server towers
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Server racks
© Shutterstock/Andrey Popov

FIGURE 6–16 Types of servers

Servers are dedicated to handling data with minimal user interaction. They do not include optical storage drives, speakers, high-end graphics displays, or other peripherals that make computers entertaining to use. Most include system components only—no monitor, keyboard, or other peripherals for users to provide input with.

VOCABULARY

Web server

enterprise server

file server

scalability

network adapter

A server is usually dedicated to a single type of task. A ***Web server*** handles the exchange of information across the Internet. For example, an Internet service provider (ISP) is a company that uses Web servers to provide Internet access to subscribers for activities such as viewing Web pages, sending and receiving e-mail, and transferring files. Large corporations use ***enterprise servers*** to provide employees access to special software used to run the company's business. Smaller businesses use ***file servers*** to share files and programs among employees.

A basic server can have processing, memory, and storage capabilities similar to a powerful desktop computer. As the number of server users increases, servers must be able to increase their processing capacity to handle the additional data, a feature called ***scalability***. The people who manage servers boost processing capacity by installing additional processors, typically similar to those in a personal computer.

Servers with thousands of users also need expanded memory, often ranging from 12 to 32 GB of RAM, and additional high-capacity storage devices for backups of data. All servers also need a reliable ***network adapter***, which is a card installed on the motherboard that connects the server to a larger network or the Internet.

Mainframes

A ***mainframe computer*** is a powerful computer designed for processing huge amounts of data for hundreds or thousands of users at the same time. Mainframe computers are larger and more expensive than servers, and are typically located in climate-controlled, secure data centers to keep the processing components cool and the data safe. See **Figure 6–17**.

VOCABULARY
mainframe computer



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FIGURE 6–17 Mainframe computers in a data center

Typical tasks for a mainframe computer include processing payroll and billing operations for a large corporation, handling millions of credit card transactions for a bank, gathering and tabulating census information for the U.S. government, and scheduling flights for an airline.

ETHICS IN TECHNOLOGY

Servers and the Environment

As the popularity of the Internet and the Web has increased, server usage has skyrocketed. The high-performance components in a server use a lot of power to respond to users' requests. Servers that provide access to online games, for example, or social networking sites such as Facebook, are grouped together in vast facilities called data centers or server farms. Companies often run the data centers around the clock and keep backup generators on standby so users don't experience interruptions in service. The *New York Times* estimates that data centers around the world use about 30 billion watts of available electricity, which is equivalent to the electricity provided by 30 nuclear power plants. Most data centers use this power inefficiently, releasing the excess as air and water pollution. Eventually, this drain on power will affect other essential industries, and the increase in pollution will affect everyone. Data centers are not alone in their responsibility for reducing their power consumption. Anyone who accesses the Internet is contributing to the problem and can raise awareness to develop solutions.

Although both servers and mainframes can process data for thousands of users, these types of computers are different in terms of their design and usage. Mainframes are designed to handle extremely large volumes of data on their own, while servers transfer data around a network, responding to requests from client computers to retrieve, send, and store data. In fact, mainframes can store hundreds to thousands of times as much data as a server and access it much more quickly. Large organizations rely on mainframes to process and store records of data that are too large for other computers. In contrast, organizations use servers to share data and provide services to other computers, especially for communication.

Data storage capacity is one reason that mainframes are much more expensive than servers, starting around $75,000 for a mainframe computer compared to $500 for a server. Another reason is that mainframes use many processors powerful enough to provide the stability, reliability, and accuracy that businesses such as financial institutions, insurance companies, and utilities need, where a disruption in computer service would be very costly or dangerous. Recently manufactured mainframes use processors with six cores that each run at processing speeds of 5.5 GHz and can be increased to 120 cores with 3 terabytes of memory. Because of these powerful components, most mainframe computers can run without interruption for decades, which is why they are worth the investment to large organizations.

Supercomputers

VOCABULARY
supercomputer

A ***supercomputer*** is also a very powerful computer distinguished by its processing capacity, especially its speed of calculation. To be classified as a supercomputer, a computer must be one of the fastest computers in the world. See **Figure 6–18**.



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FIGURE 6–18 Supercomputer

ABOVE AND BEYOND

As of June 2013, the fastest supercomputer in the world was the Tianhe-2, which was built in China for around $3 billion. It can process data for a sustained period at a rate of more than 2.5 petaflops per second, which is the equivalent of 2,500 trillion calculations per second.

Rather than using the quad-core processors that personal computers use, supercomputers have processors with a million or more cores. The extraordinary power of supercomputers is used primarily for scientific applications that need to perform complex calculations very rapidly, such as launching astronauts or robots into space.

SUMMARY



In this lesson, you learned:

- A personal computer is a computing device that can perform input, processing, output, and storage activities on its own and is designed to be used by one person at a time.
- The personal computer you decide to buy depends on how you plan to use it, your budget, and its value, which is the quality of the computer's features, construction, and components compared to the price.
- Computer use can be basic, intermediate, or advanced. Basic usage involves occasionally visiting Web pages and creating word-processing documents. Intermediate usage involves more frequent work on the computer to access the Internet and productivity software. Advanced usage involves tasks that require the maximum or near the maximum amounts available in processing speed, memory usage, or storage capacity.
- The quality of a computer is determined primarily by the performance of its system components, including the capacities and speeds of the processor, RAM, and storage devices.
- When considering a personal computer to purchase, you can select from four major types: desktop computers, laptops, tablets, and smartphones.
- A desktop computer fits on or next to a desk, is designed to be stationary, and runs on power from a wall outlet. With a traditional desktop computer, the system unit, monitor, keyboard, and pointing devices are separate pieces of equipment. The computer case containing the processing components is called a tower.
- A recently developed type of desktop computer is called an all-in-one desktop, which houses the processing components in the same case that holds the screen, not in a tower.
- Traditional desktop computers are preferred by computer enthusiasts who plan to upgrade their systems. People who want a desktop computer but lack enough physical space can consider an all-in-one desktop, which is more compact than a traditional desktop computer, can be moved more easily, often includes a touchscreen, and has a sleek, attractive style.
- A laptop computer (sometimes called a notebook) is a lightweight mobile computer about the size of a paper notebook that includes the system components, keyboard, pointing device, and display monitor in a single unit.
- Today's laptops have as much computing power and perform as well as most desktop computers because laptops can include top-notch processors and large amounts of RAM and hard disk storage capacity. However, because it costs more to produce components that fit a laptop's compact design, laptops are slightly more expensive than desktop computers with the same power, speed, and storage capacity.
- Netbook computers (also called ultrabooks) look like laptops but are smaller and lighter, have less power and storage capacity, lack a CD/DVD drive, and provide a smaller keyboard and display screen, but include batteries that hold a charge longer.
- Like laptops, tablets run on battery power and can be plugged into a wall outlet as necessary. True tablets use a slate design; they are rigid and do not fold. Convertible tablets use a hybrid design that includes a swivel screen or removable keyboard so you can use the computer as a laptop or tablet.
- To compare tablets and laptops in general, consider their input devices, battery life, storage capacity, performance, physical factors, and price as well as your computer usage.
- Smartphones connect wirelessly to the Internet, include built-in cameras, music players, and global positioning systems, and let you send and receive phone calls, e-mail messages, and text messages.
- To evaluate smartphones, you can use the same set of criteria for comparing laptops and tablets: input devices, battery life, storage capacity, performance, physical factors, price, and computer usage.
- Mobile devices besides laptops, tablets, and smartphones include electronic book (e-book) readers, portable media players, and handheld game devices.
- An embedded computer is a processor built into a household appliance or other device. Its appeal and strength are that it adds computing power to a device without needing intervention from a user.
- Servers, mainframes, and supercomputers are large computers because they are designed for use by up to tens of thousands of people in many cases. To support that many users, large computers need much more processing power, memory, and storage capacity than personal computers.
- Servers are dedicated to handling data with minimal user interaction. Most include system components only—no monitor, keyboard, or other peripherals. Types of servers include Web servers, enterprise servers, and file servers.
- A basic server can have processing, memory, and storage capabilities similar to a powerful desktop computer. As the number of server users increases, servers must be able to increase their processing capacity to handle the additional data, a feature called scalability.
- A mainframe computer is a powerful computer that is larger and more expensive than a server and is designed for processing huge amounts of data with stability, reliability, and accuracy.
- To be classified as a supercomputer, a computer must be one of the fastest computers in the world. Supercomputers are used primarily for scientific applications that need to perform complex calculations very rapidly.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. Tablets with a slate design have a blue-gray case.

T F 2. The average desktop computer has much more computing power and performs more efficiently than the average laptop.

T F 3. You should know about the capabilities of servers because they play a role in everyday life.

T F 4. How you plan to use a computer is the least important factor in a decision to purchase a computer.

T F 5. Smartphones use touchscreens or small keyboards as their input device.

MULTIPLE CHOICE

Select the best response for the following statements.

1. The computer case containing the processing components for a traditional desktop computer is called a(n) _____.

   A. clamshell C. notebook

   B. tower D. all-in-one

2. A(n) _____ tablet uses a hybrid design that includes a swivel screen or removable keyboard so you can use the computer as a laptop or tablet.

   A. convertible C. expandable

   B. slate D. embedded

3. The average _____ can run at least 8 hours on battery power, while the average _____ can run only for 3–4 hours.

   A. laptop; desktop computer C. laptop; tablet

   B. tablet; laptop D. tablet; desktop computer

4. To compensate for small screens, smartphones have an increased _____.

   A. processing speed C. backlighting

   B. call time D. screen resolution

5. You use a(n) _____ to download and read electronic versions of printed books, magazines, and newspapers.

   A. server C. embedded computer

   B. cloud computer D. e-book reader

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. How does a computer's processing capacity affect the amount of RAM you can use?

2. What are the four major types of personal computers?

3. How is an all-in-one desktop different from a traditional desktop computer?

4. What are the pros and cons of input devices for a laptop and a tablet using a slate design?

5. Why are laptops well-suited to productivity tasks?

6. What major advantage do smartphones offer over other mobile computing devices?

7. Why are portable media players also called MP3 players?

8. How do embedded computers evolve into mobile computing devices?

9. Why do servers need to have scalability?

10. Why is battery life a significant consideration when buying a mobile computer?

PROJECTS

PROJECT 6–1

SkyDrive is an online storage service that lets you store up to 7 GB of files in a secure location on a Microsoft server, which you can access any time you have an Internet connection. Windows Help and Support provides more information about SkyDrive. Complete the following steps, and then answer questions about what you find. Submit the written answers as your instructor requests.

1. If necessary, click the **Desktop** tile on the Start screen to display the desktop.
2. Display the Charms bar, and then click the **Settings** charm.
3. On the Settings menu, click **Help** to open the Windows Help and Support window.
4. In the Search box, type **SkyDrive**, and then press the **Enter** key.
5. In the search results, select the most relevant topics, read the topics, and click links to explore the information about SkyDrive.
6. Answer the following questions:
   - What are the four ways you can work with files saved on your SkyDrive?
   - On the SkyDrive Web site, how can you create files?
   - What is an advantage of using SkyDrive rather than saving files on your own computer?

PROJECT 6–2

In this project, you explore the Windows Store, which is an online resource for applications you can use with Windows. If you have a mobile computer, you can download software and games to turn your computer into an e-book reader or game device. You take screenshots as you explore. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. On the Start screen, click the **Store** tile to display the Windows Store.
2. Press the **Print Screen** key to capture an image of the screen, and then save the image as a Paint file named **Windows Store**.
3. Scroll to the right and then click **Top free** to display popular free apps available in the Windows Store.
4. Press the **Print Screen** key to capture an image of the screen, and then save the image as a Paint file named **Free Apps**.
5. Scroll as necessary to find an app that lets you read electronic books, and then click the app to display more information about it.
6. Press the **Print Screen** key to capture an image of the screen, and then save the image as a Paint file named **E-books**.
7. Press the **Alt+F4** keys to close the Windows Store screen and return to the Start screen.

PROJECT 6–3

In this project, you use Windows Help and Support to learn more about using a portable media player with another type of computer, and then answer questions about what you learned. Submit the written answers as your instructor requests.

1. On the desktop, display the Charms bar, and then click the **Settings** charm.
2. On the Settings menu, click **Help** to open the Windows Help and Support window.
3. Search Help topics about Windows Media Player to answer the following questions:
   - What is Windows Media Player?
   - What does it mean to sync files from a Windows Media Player to a portable media player?
   - How can you sync files automatically?
4. Close the Windows Help and Support window.

TEAMWORK PROJECT

You work for a start-up company that creates accessories for handheld game devices. The company wants to expand to create accessories for personal computers. Your manager asks you and two other team members to research which personal computers people in your area use and how they use them. Work as a team of three to complete the following steps.

1. As a team member, briefly interview 4–5 people to identify the following information:
   - Does the person use one or more personal computers? If so, what type(s)?
   - What kinds of activities does the person perform on each type of computer? Ask the person to describe the activities and how often he or she performs them.
2. Meet as a team to analyze the results.
3. Create a table listing the types of computers your research identified. These computer types will be your row headings. Next, use each type of computing activity as a column heading in the table, consolidating similar activities if possible. Enter the number of times each type of computer was used for each type of activity.

CRITICAL THINKING

CRITICAL THINKING 6–1

As mentioned in this lesson, reducing power consumption is a major concern for servers. Energy efficiency is a concern for personal computers as well. Complete the following.

1. Visit at least two Web sites to find information about how to identify energy-efficient computers, and then answer the following questions:
   - What does the Energy Star label signify?
   - What is EPEAT?
   - What is the Studio Hybrid from Dell? What makes it significant?
   - What makes the Mac mini an environmentally friendly computer?
2. Submit your findings as your instructor requests.

CRITICAL THINKING 6–2

IC3 1-2.2.4

Tablets are becoming more powerful and popular, and are estimated to be the computing device of choice for most Americans in the near future. Where can you find a good deal on a tablet? Complete the following.

1. Using online sources, determine the highest and lowest specifications for tablets available today. Consider size, weight, processing speed, RAM, storage capacity, and any other features that are important to you.
2. On a Web site, find a tablet that provides features in the middle of the range you identified. Note its price and components such as the speed and capacity of its processor, memory, and storage devices.
3. Find a different tablet for about the same price. What features and specifications does it have?
4. Submit your comparison as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 6–1

Learn more about laptops by researching their history, current state, and possible future development. Visit at least two Web sites to answer the following questions. Submit the written answers as your instructor requests.

1. When was the IBM PC Convertible introduced? Why is it significant in the history of laptops? How much RAM did it have?
2. What is a whitebook? What percentage of laptops are whitebooks?
3. What types of batteries do laptops currently use? What benefits do they offer?
4. What is significant about the IdeaPad Yoga laptop from Lenovo?
5. What is the Rolltop laptop?

ONLINE DISCOVERY 6–2

IC3 1-2.2.1

Besides personal computers, you can use other types of computers designed specifically to access a network. Research types of computers not covered in this lesson on at least two Web sites, and then answer the following questions. Submit the written answers as your instructor requests.

1. What is a thin client?
2. What is a nettop? How does a nettop compare to a standard desktop computer?
3. When would you use a workstation? How does a workstation compare to a standard desktop computer?

JOB SKILLS

People use all types of computers on the job, including desktop and mobile computers. You can prepare yourself for a professional workforce by learning how people in a field of your interest use computers. Complete the following steps.

1. Choose a field in which you'd like to work, such as health care, travel, manufacturing, or technology.
2. Brainstorm ways you think people in your chosen field use computers. Develop a list of 3–4 ways. For example, someone in the transportation field might use mostly mobile computers when they are traveling, and then use a desktop computer at the office.
3. Search for information on the Internet to verify your ideas. If one of your ideas turns out to be incorrect, replace it on the list with an accurate description.
4. Submit your list to your instructor as requested.

EXPLORE AND SOLVE

Did you know?

- You can compare smartphone specifications on the Web sites of smartphone manufacturers.
- You can read reviews from experts and users to learn about the pros and cons of a particular model.

1. Using a Web browser, go to the Web site of a smartphone manufacturer other than Apple, such as Samsung (www.samsung.com), Nokia (www.nokia.com), BlackBerry (www.blackberry.com), or HTC (www.htc.com).
2. Select three models of smartphones and compare their specifications. List the price, size, weight, battery life, memory, and one other feature important to you. Be sure to include your smartphone usage in your evaluation.
3. Choose one model of smartphone that provides the best combination of price, features, and capabilities for how you use a smartphone.
4. Search online for reviews of that particular model of smartphone. For example, if you chose the Samsung Galaxy S IV, search for **Samsung Galaxy S IV reviews**. Visit at least three Web sites with reviews from experts, and then answer the following questions:
   - Experts often provide ratings for products. What ratings did your smartphone receive and from which experts?
   - What are the three best features of the smartphone you selected according to the experts? Provide an example of at least one specification that supports these features.
   - What are the two weakest features of the smartphone according to the experts? Provide an example of at least one specification that supports these features.
   - What is the average price of the smartphone you selected?
   - What conclusions do you draw from the reviews you read?

   IC³ 1-2.2.5
5. Submit your answers as your instructor requests.



Estimated Time:
1.5 hours

LESSON 7

Software Management

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe how to install various types of software.
- Identify the tasks a setup program performs during installation.
- Explain when and how to uninstall software.
- Describe how to reinstall software, including operating systems.
- Identify types of software licenses.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

activate
end user license agreement (EULA)
freeware
mobile app
public domain software
registry
setup program
shareware
single-user license
site license
software license
software registration
system recovery disk
uninstaller

Microsoft product screenshots used with permission from Microsoft Corporation.

In this lesson, you learn about installing application software, utility programs, and operating systems on various types of computing devices, including desktop computers and mobile computers. The steps for installing software varies depending on how the software is distributed, such as on a DVD or on a Web site. You also learn how to uninstall software, which you might do when you no longer use the software or when the software is causing system problems, and then reinstall it. Finally, you survey the licenses and terms users agree to when installing and using software.



1-3.1.1

Installing Software

When you purchase a personal computer, it already contains software such as the operating system, utility programs, and some basic applications so you can use the computer as soon as you turn it on. Eventually, you will probably want to install other software to perform productivity tasks, enjoy games and other entertainments, and add tools that enhance the operating system or improve system performance. Recall from Lesson 2 that when you install software, you move a copy of the software from its distribution location to your computer. A ***setup program*** is included with the software to guide you through the installation steps and prepare the software so you can use it on your computer.

VOCABULARY

setup program

mobile app

The method you use to install software varies depending on the type of personal computer you are using, the type of software you are installing, and how it is distributed. You typically install four types of software: desktop applications, Windows 8 apps, mobile apps, and utility programs such as drivers and system tools. Recall that a desktop application is a program that opens and runs in a window on the desktop. The term usually applies to Windows applications, but includes those for Mac and Linux applications as well. You install desktop applications on desktop computers and laptops.

QUICK TIP

Besides application software and utility programs, you can also install an operating system on a computer, though you might only do so if you were upgrading from one major release of the operating system to another, such as from Windows 7 to Windows 8.

As you know, a Windows 8 app is one you start from the Start screen; it then takes up the entire screen instead of opening in a window on the desktop. You can install and run Windows 8 apps on a desktop computer, laptop, or tablet with Windows 8 installed.

A ***mobile app*** is specifically designed for a handheld computer, such as a tablet or smartphone. For example, applications developed for Windows RT are mobile apps, as are those created for the Apple iPad and Android phones.

Table 7–1 provides an overview of the types of software you can install on a personal computer.

TABLE 7–1 Types of software to install

PERSONAL COMPUTER	TYPE OF SOFTWARE
Desktop or laptop	Desktop application Windows 8 app Desktop operating system Other system software
Tablet or smartphone	Mobile app Mobile operating system

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Overview of Installation Steps

You can install software using one of three distribution methods: CD or DVD, a compressed file on a Web site, or a store app, such as an Apple App Store app or a Windows Store app. If you receive software on a CD or DVD, you insert the disc in a CD/DVD drive on your computer and wait for the setup program to start. If the setup program does not start automatically, display the files on the disc using a file manager such as File Explorer, and then double-click the setup program file, which usually has a name similar to setup.exe. See **Figure 7–1**.

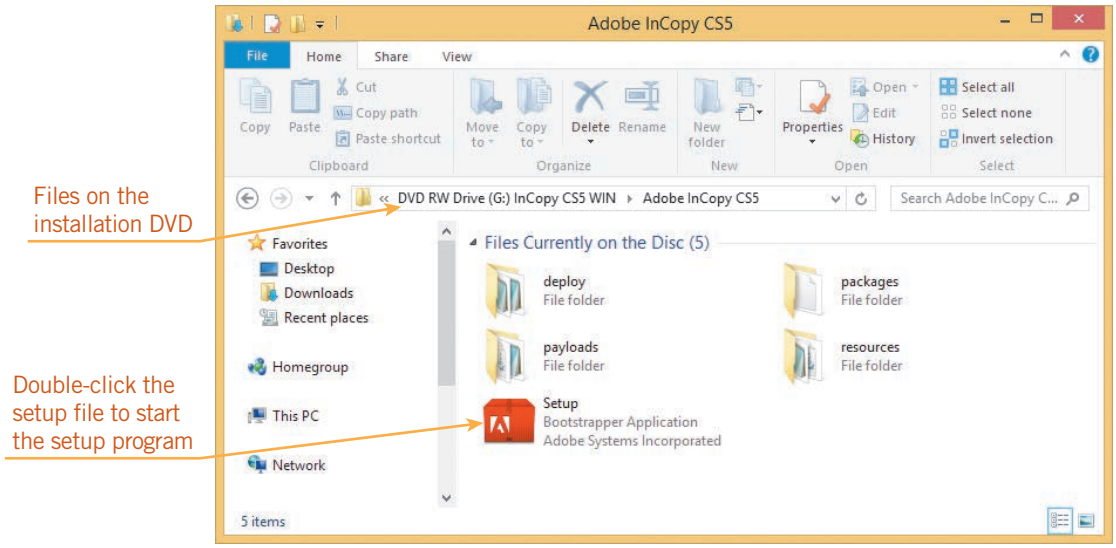
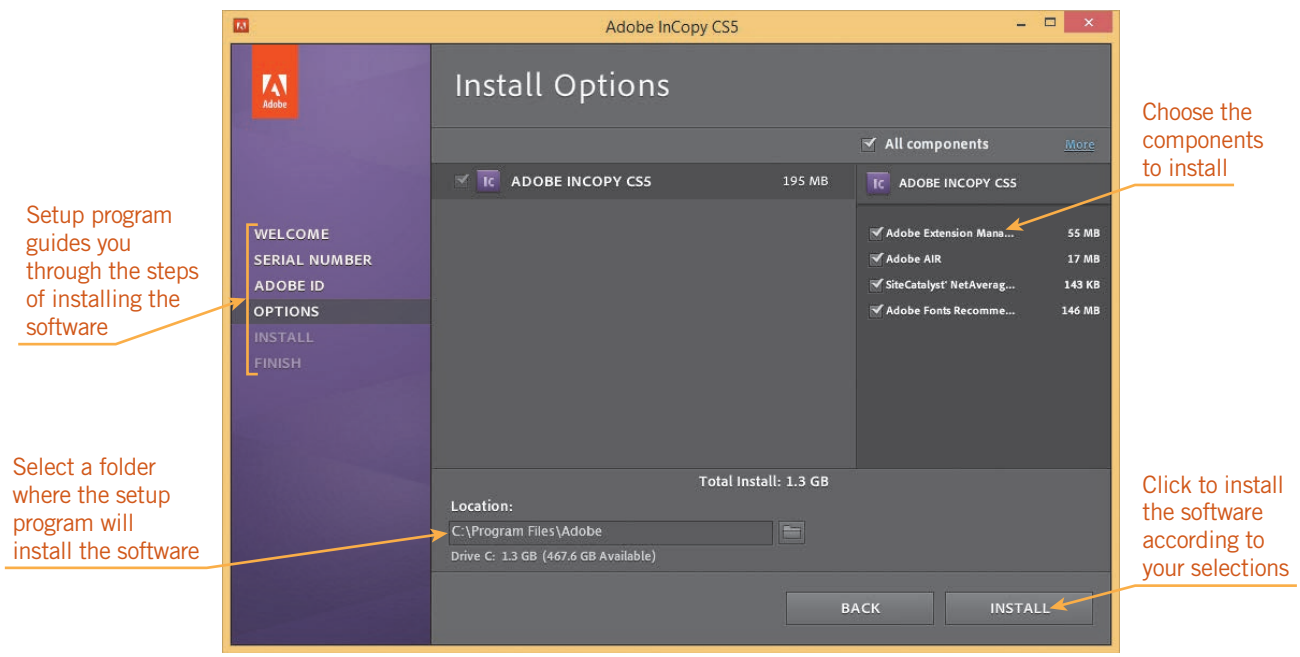


FIGURE 7–1 Setup program on a DVD

The setup program guides you through the steps to install the software, including choosing the components you want to install and selecting a folder for the software. See **Figure 7–2**.



Adobe product screenshot reprinted with permission from Adobe Systems Incorporated.

FIGURE 7–2 Selecting installation options

QUICK TIP

Compressed files containing Windows software can have an .exe, .msi, or.zip extension, while those for Mac software usually have a .dmg extension.

Another way to install software is from a Web site, such as one provided by a software developer or publisher. In this case, the software and a setup program are contained in a single compressed file available on the Web site. To install software using this distribution method, you select options on a Web page such as the operating system you are using and the language for the software, and then click a link or button to download and save the compressed file on your hard disk. See **Figure 7–3**.

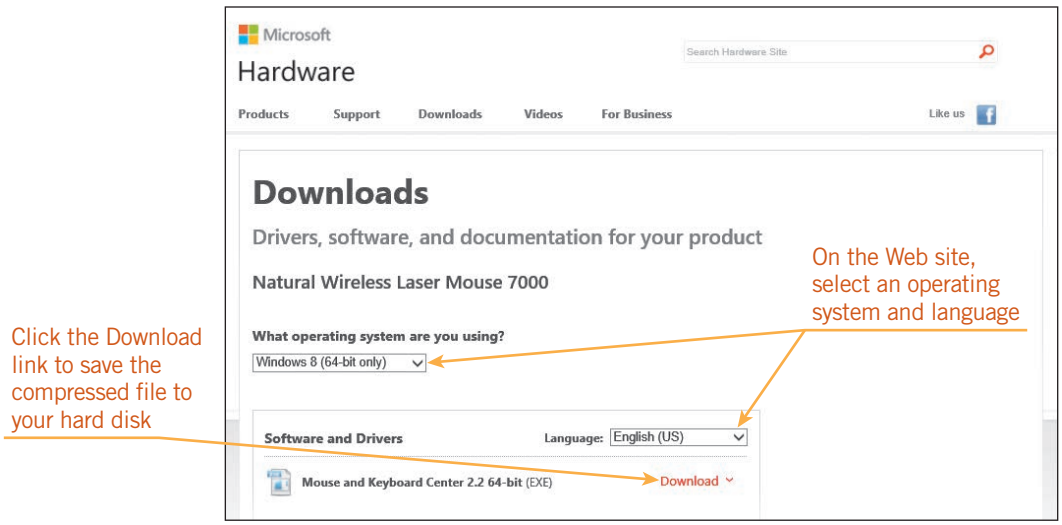


FIGURE 7–3 Selecting options to download a driver from a Web site

Usually, the setup program starts as soon as the file is downloaded. If it does not, you use a file manager to extract the files from the compressed file, and then double-click the setup.exe file to start the setup program. If the compressed file is not too large, you can bypass saving and extracting the files by choosing to run the setup program immediately instead. **Figure 7–4** illustrates the process of installing a mouse driver from a compressed file on a Web site to a computer running Windows 8.

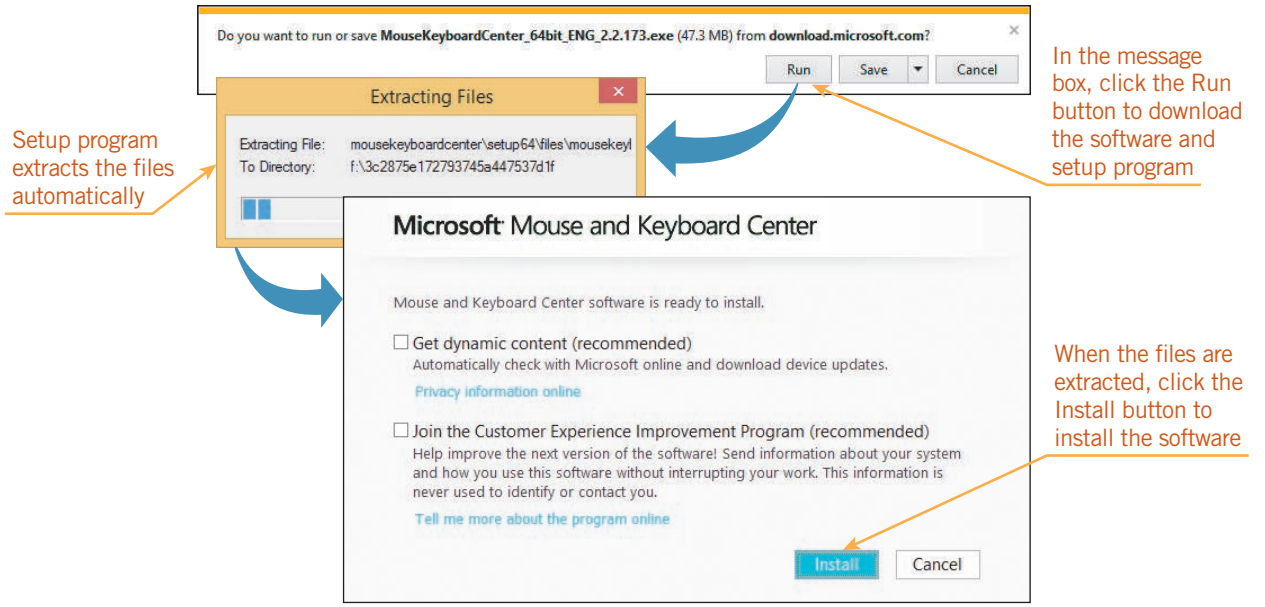


FIGURE 7–4 Installing a driver from a compressed file on a Windows 8 computer

Store apps such as the Windows Store, the Apple App Store, and the Google Play Store provide access to apps designed for a particular operating system. For example, you use the Windows Store app to display apps available for Windows 8 and Windows RT. On an iPhone or iPad, you select the App Store icon to visit the Apple App Store and display apps available for iOS. See **Figure 7–5**.



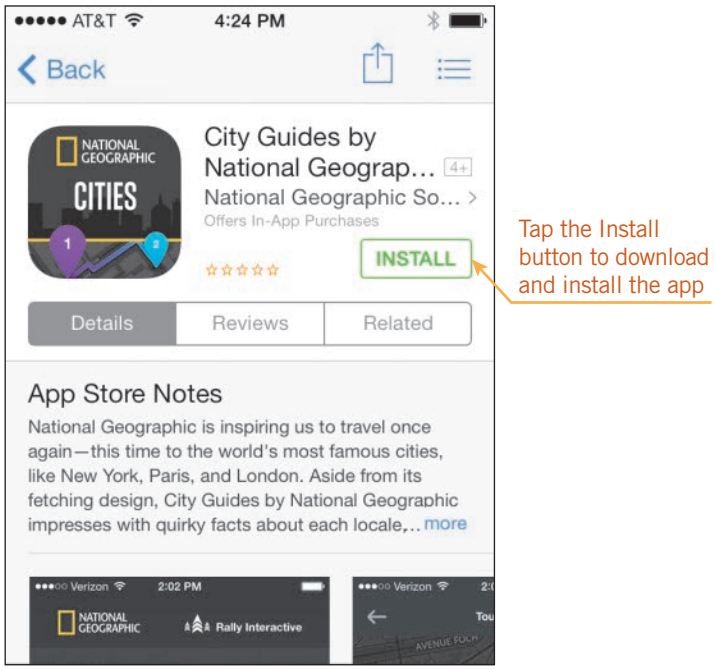
Courtesy of Apple Computers

FIGURE 7–5 Visiting the Apple App Store

QUICK TIP

You install software upgrades the same way you install new software: using a CD or DVD, Web site, or store app.

When you find an app you want to install, you use a button or link to purchase the app, if necessary, and then download and install it automatically. See **Figure 7–6**.



Courtesy of Apple Computers

FIGURE 7–6 Downloading and installing an app

Installation Tasks

Depending on the size of the files, installation can take from a few seconds to several minutes if you are installing a desktop application, mobile app, or utility program. Installing an operating system takes longer, sometimes up to an hour, and requires you to restart your computer one or more times.

If you are installing software on a personal computer, the setup program typically performs the following tasks:

- *Copies files*—The setup program copies files from the distribution location to your hard disk, and then creates a log to indicate where it stores files during installation.
- *Extracts files*—If the files are stored in a compressed file, the setup program extracts them so they can all be used in the installation. The setup program might also create folders and subfolders for the files, usually in a folder in the root directory named Program Files or Program Files (x86). For example, Microsoft Office is stored in subfolders of the Program Files ▶ Microsoft Office folder. This program folder contains most of the files the application needs to run. (The setup program also stores a few files in system folders.) The program folder is different from the folder where you download the files and where the setup program extracts them. If the files in the program folder are corrupted, you can use the extracted files to reinstall the software.

- *Checks for existing versions of the software*—The setup program scans for other versions of the software. If it finds an earlier version, it might need to uninstall it first or it might be able to use files already installed on your computer. If it finds the current version of the software and all the files are up to date, the setup program stops and displays a message indicating the software is already installed.
- *Verifies system requirements*—The setup program checks system components, such as RAM and the hard drive, to make sure they have enough capacity to run and store the software. If your computer does not meet the minimum system requirements, the setup program stops and displays a message describing the problem.
- *Finds drivers and other system files*—If you are installing application software, the setup program looks for and activates drivers the software uses, such as printer drivers. It also looks for system files it might need to provide services such as Internet access.
- *Updates system files*—The setup program provides configuration data to the operating system so it can run the software. On a Windows computer, this information is stored in the Windows ***registry***, a database of information about your computer's configuration.
- *Provides a way to start the software*—The setup program adds a button, icon, or tile to the graphical user interface so you can start the software. For example, it adds a tile to the Windows 8 Start screen or an icon to the iPad home screen.

In Step-by-Step 7.1, you download and install Free Alarm Clock, a Windows desktop application you can use to set alarms as reminders for events and other activities. The software and setup program are available on the developer's Web site in a compressed file. In the following steps, you download and install the Free Alarm Clock software. In Step-by-Step 7.2, you uninstall it.

To install software on a Windows computer, you need to be signed in using an Administrator account or you must know the Administrator's password. If you are not allowed to use an Administrator account or if you do not know the Administrator's password, read but do not perform the following steps.

Because you are installing a desktop application, it is more convenient to use the version of Internet Explorer available on the desktop to download and install the Free Alarm Clock software.

ABOVE AND BEYOND

The Windows registry stores configuration settings and options about the hardware and software on your computer. For example, to indicate an application's default settings, the setup program enters them in the registry. Windows refers to the registry settings constantly as it runs software, accesses hardware, and performs other operating system tasks. You should not change the registry yourself—Windows and applications make necessary changes automatically—because an incorrect setting could disable your entire system. However, occasionally a technical expert will instruct you to change a setting in the registry, usually after explaining how to back it up. If you trust the expert, you can follow the instructions to back up and then change the registry.

VOCABULARY

registry

Step-by-Step 7.1



1. On the Start screen, click the **Desktop** tile to display the desktop.
2. Click the **Internet Explorer** button on the taskbar to start Internet Explorer.

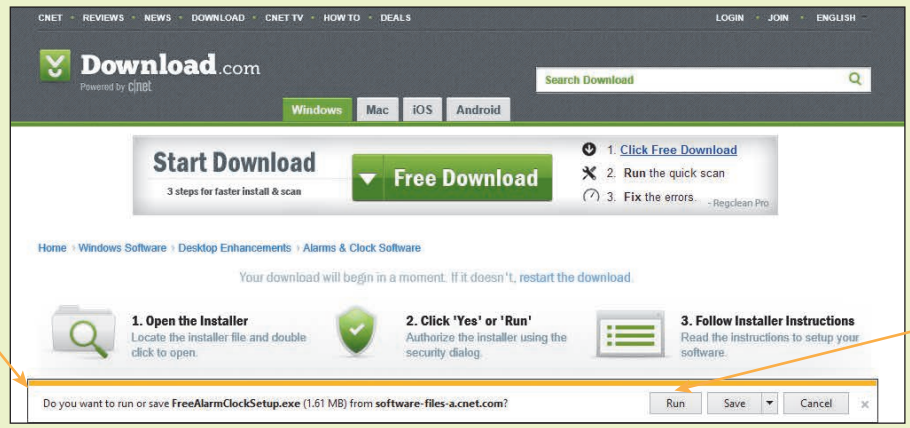
3. Click in the **Address** bar at the top of the window, type **freealarmclocksoftware.com**, and then press the **Enter** key to open the Free Alarm Clock for Windows Web page. See **Figure 7–7**.

FIGURE 7–7
Free Alarm Clock for Windows Web page



4. Click the **Download Free Alarm Clock 3.0 (1.66 MB)** link to open a Web page where you can begin the process of downloading and installing the software. (The version and size displayed on the Web page might differ.)
5. Click the **Download Now** button to display a message box at the bottom of the screen that asks whether you want to run or save the compressed file. See **Figure 7–8**.

FIGURE 7–8
Message box for running, saving, or canceling the setup program



6. Click the **Run** button to download the Free Alarm Clock software and open the User Account Control dialog box. Click the **Yes** button to start the setup wizard, which will guide you through the installation steps. See **Figure 7–9**.

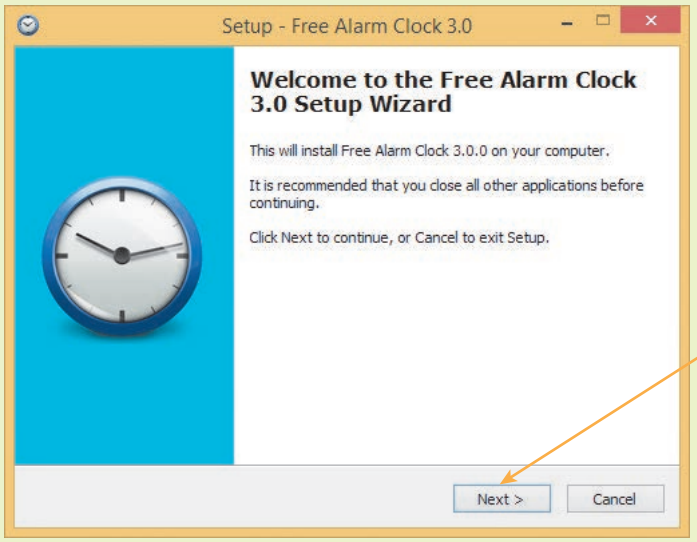


FIGURE 7–9
Setup wizard

7. Click the **Next** button to start the wizard. A dialog box opens in which you select a destination folder for the software files.
8. Click the **Next** button to accept the default location for the software files. A dialog box opens in which you specify where you want to place the program's shortcuts.
9. Click the **Next** button to accept the default location for the shortcuts. A dialog box opens in which you can choose whether you want setup to create an icon on the desktop.
10. Click the **Next** button to create a desktop icon, and then click the **Install** button to install the software. A dialog box opens indicating that setup has finished installing the software.
11. Click the **Launch Free Alarm Clock** check box and the **Hot Alarm Clock on the Web** check box to remove the check marks and deselect these options, and then click the **Finish** button.
12. Close all open windows, and then confirm that the Free Alarm Clock icon appears on the desktop.

QUICK TIP

To verify that software has been installed successfully, you should start the software after the installation is complete.

1-3.1.2

Uninstalling Software

VOCABULARY
uninstaller

You can uninstall almost any software installed on your computer, including applications, utility programs, and operating systems. You typically uninstall an application if you no longer use it. Doing so frees up space on your hard disk, sometimes a significant amount of space, depending on the software. To uninstall a desktop application from a Windows computer, you use an ***uninstaller***, which is a tool similar to a setup program. Uninstallers are provided with installed software so you can completely remove the software from your computer. If you simply delete the program folder of a Windows desktop application, system files still contain configuration settings and other data that can slow system performance or prevent the operating system from loading correctly. In addition, most Windows applications store files in more than one folder, and you need the uninstaller to track them down. You use a Control Panel tool called Programs and Features to start an uninstaller that completely removes a desktop application from your computer.

In most cases, you can uninstall a desktop application from a Mac by dragging the application's icon to the Trash, a Mac OS X tool similar to the Windows Recycle Bin. Mac OS X performs a few clean-up tasks behind the scenes. Larger applications or those that interact with other applications, such as Microsoft Office for Mac, provide an uninstaller that you use to thoroughly remove an application.

To uninstall a Windows 8 app, you right-click the app's tile on the Start screen or Apps screen, and then click the Uninstall button on the Apps bar. See **Figure 7–10**. The app's uninstaller takes care of completely removing the software from your computer.

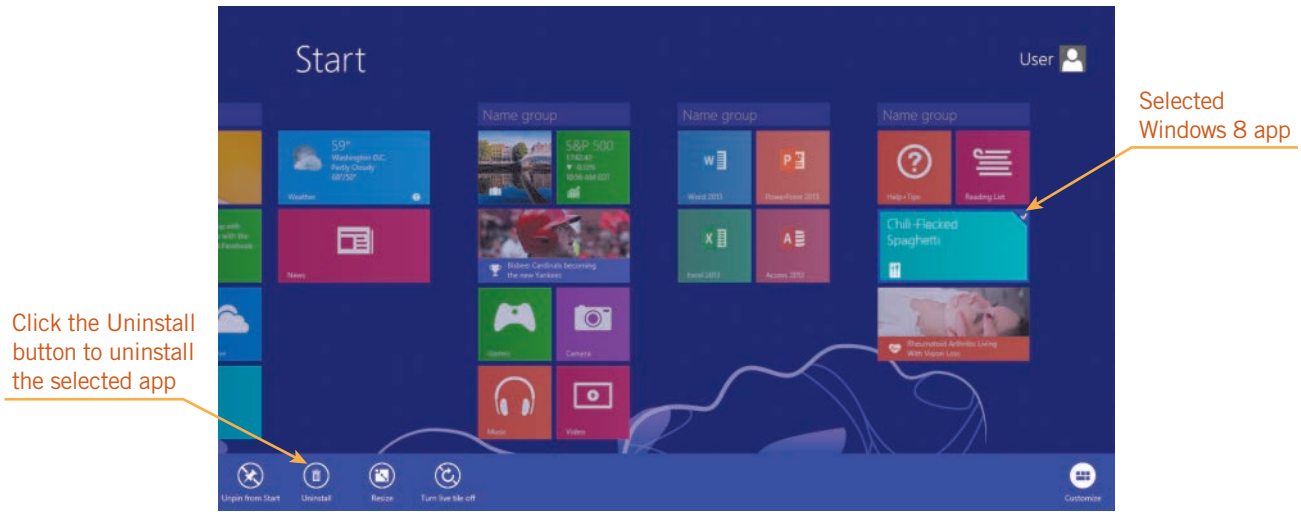
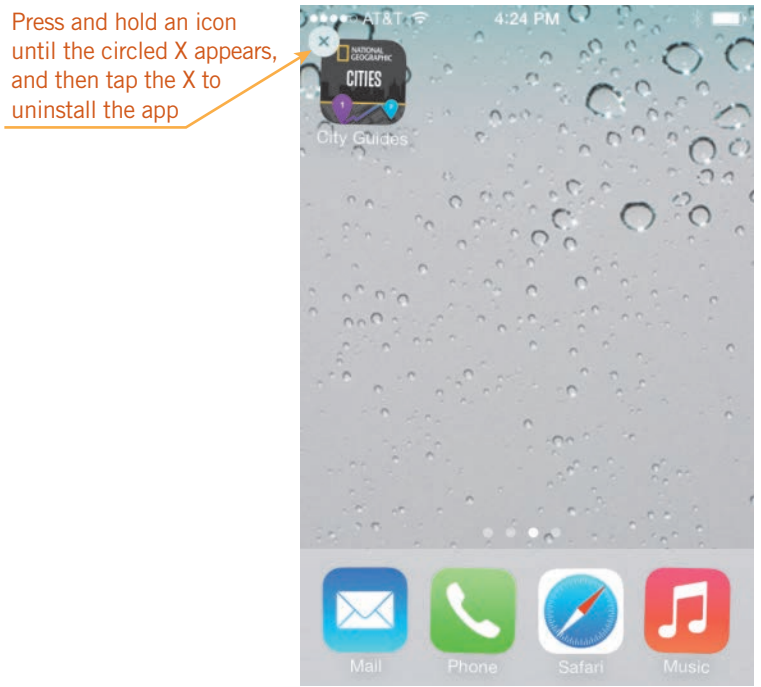


FIGURE 7–10 Uninstalling a Windows 8 app

To uninstall a mobile app from an Android tablet or smartphone, you use the Application manager on the Settings menu. The Application manager lists all the apps installed on the device. You select the app you want to uninstall, and then tap the Uninstall button. Uninstalling is even more straightforward on an iPhone, iPad, or iPod Touch: you press and hold the app's icon until the icon begins to shake and a circled X appears on the icon, and then you tap the X to uninstall the app. See **Figure 7–11**.



Courtesy of Apple Computer

FIGURE 7–11 Uninstalling a mobile app

You can also uninstall a driver or utility program if you are having trouble with a device or no longer use the program. In addition, a hardware manufacturer might instruct you to uninstall a driver if you upgrade to new hardware such as a monitor or video card. In all cases, you should use an uninstaller to uninstall the driver or utility program from your computer so you can remove the files as safely as possible. Uninstallers for some system tools are listed in the Programs and Features window that you access from the Control Panel. Others are included with the tool itself. For example, as you learned in Lesson 5, you can open the Properties dialog box for a device, click the Driver tab, and then click the Uninstall button to uninstall the driver.

Uninstalling an operating system means deleting it from your computer. If you don't immediately replace the deleted operating system with a new one, your computer won't run. You might want to uninstall the operating system when you are preparing to recycle a computer and need to remove any personal information such as passwords stored in system files. In that case, you should first back up and then thoroughly remove all of your data. You can use a system tool called a disk wiper or disk eraser to uninstall the operating system and remove your data at the same time. If you are selling or donating your computer, you can wipe the disk and then reinstall an operating system from CDs or a DVD so the new owner has an operating system to work with.

ABOVE AND BEYOND

It is possible to install more than one operating system on a computer, which is called a dual-boot or multiboot system. Each operating system resides on its own hard drive or partition, which is a separate part of a hard drive. For example, for one computer you could install Windows on one hard drive or partition, and Linux on another. You could uninstall the operating system from one drive or partition and still be able to run the computer using the remaining operating system.

Uninstalling Tasks

If you are uninstalling software other than an operating system on a personal computer, the uninstaller typically performs the following tasks:

- *Deletes files*—The uninstaller refers to the log created by the setup program to locate and then delete the software's files.
- *Restores system settings*—If the setup program changed system settings, the uninstaller restores them to their original settings. On a Windows computer, this includes registry entries. The uninstaller refers to the setup log again and reverses the changes to the registry.
- *Restores the graphical user interface*—The uninstaller removes the button, icon, or tile for starting the software from the graphical user interface.

In Step-by-Step 7.2, you uninstall the Free Alarm Clock software using the Control Panel. If you were not allowed to install this software in Step-by-Step 7.1, read but do not perform the following steps. In addition, to uninstall software on a Windows computer, you need to be signed in using an Administrator account or you must know the Administrator's password. If you are not allowed to use an Administrator account or if you do not know the Administrator's password, read but do not perform the following steps.

Step-by-Step 7.2

1. On the desktop, display the Charms bar, click the **Settings** charm, and then click **Control Panel** to open the Control Panel window.
2. In the Programs category, click **Uninstall a program** to display the Programs and Features window. This window lists the desktop applications and system tools installed on your computer.
3. Scroll the list of installed software, if necessary, to find the Free Alarm Clock application, then click **Free Alarm Clock 3.0.0** to select it. (The version number for your software might differ.) The Uninstall button appears on the toolbar. See **Figure 7–12**. The other software listed in your Programs and Features window will differ.

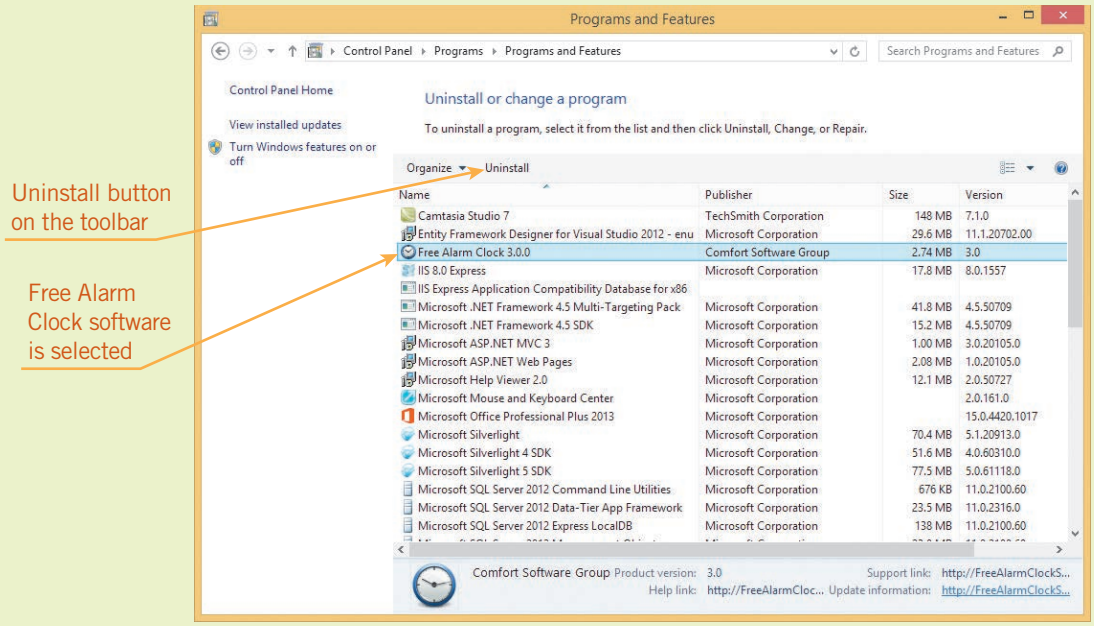


FIGURE 7–12
Selecting software to uninstall

4. Click the **Uninstall** button on the toolbar. The uninstaller program starts and displays a dialog box asking if you are sure you want to completely remove the software.
5. Click the **Yes** button to open the Free Alarm Clock Web page and a message box indicating the software was successfully removed from your computer.
6. Click the **OK** button to close the uninstaller.
7. Close all open windows, and then confirm that the Free Alarm Clock icon has been removed from the desktop.

QUICK TIP

The buttons on the toolbar vary depending on the uninstaller for the selected software. You might see the Uninstall/Change button, or the Repair button, which you can use to replace damaged application or system files with original files.

Reinstalling Software

IC3 1-3.1.3

If you've installed software but it's not running properly, you can reinstall it. For example, if you install a desktop application, Windows 8 app, or mobile app, try to start the software as usual, and then discover that the application doesn't start, you can uninstall the software and try installing it again on the same computer. Reinstalling can replace files that might have become corrupted during or shortly after installation. In fact, corrupt or missing files is the most common cause of software problems, and uninstalling then reinstalling is the easiest way to solve it.

To reinstall a desktop application, Windows 8 app, or mobile app on the same device as the original software, you can complete the following general steps:

1. Uninstall the software as described in the "Uninstalling Software" section of this lesson.
2. Restart the computer. This resets the computer and frees system resources, greatly reducing the possibility of corrupting a file.

3. Install the software as described in the "Installing Software" section of this lesson. If possible, select a Web site or store app as the distribution location so you can install a recent version of the software.

4. If the setup program prompts you to check for and install updates, choose the option to do so. In most cases, it's best to install the most recent version available.

Developers of system software don't usually require you to uninstall programs such as drivers before reinstalling the software. If you received the software on a CD or DVD, which might be the case with drivers for hardware you purchased, you can insert the disc in a CD/DVD drive and wait for the setup program to start or double-click the setup.exe file in File Explorer to start it yourself. If updates have been installed for the drivers, the software on the disc is probably older than the software currently installed on your computer. In this case, reinstalling the software replaces the most current drivers with older drivers that might not be compatible with new hardware.

Reinstalling an Operating System

If an electrical storm, power surge, virus, or another threat causes system problems severe enough to prevent your operating system from running normally, you can reinstall it. Most setup programs or the operating systems themselves provide an option to install a fresh copy of the operating system while retaining your data and settings. Some also retain your application software. For example, you can reinstall Windows 8 using a Refresh option that retains your original Windows 8 apps, though not your desktop applications. You'll learn how to refresh Windows 8 in Step-by-Step 7.3. You can reinstall other operating systems as follows:

- *Mac OS X*—You can reinstall Mac OS X by choosing the Restart command on the Apple menu, and then holding down the Command+R keys as the computer restarts. When an option to reinstall Mac OS X appears on the screen, click it to download and install the software from an Apple server. (You must be connected to the Internet to reinstall.) Follow the on-screen instructions to complete the reinstallation. Reinstalling keeps your data files and settings intact.
- *Linux*—The method to reinstall varies depending on the Linux distribution. For most distributions, you reinstall using your original installation media, which overwrites all the files except your data files. However, you can back up the files containing your settings and then restore the files to your fresh installation of Linux.
- *iOS*—You can reinstall or update iOS by connecting your smartphone or tablet to the Internet or to a computer where iTunes software is installed. (iTunes is software you use to play, download, and organize digital media files on a personal computer.) With the first method, you use the General category in the Settings app to select the Software Update command, and then follow the on-screen instructions. To use iTunes, you connect your smartphone or tablet to a desktop or laptop computer running iTunes. On the iTunes menu, click Check for Updates and then follow the on-screen instructions to reinstall iOS.
- *Android*—You can reinstall or update Android by using the Settings app. Select a command called About Tablet or something similar, and then choose System Updates to check for an update or reinstall Android. Manufacturers of Android smartphones and tablets also send notices about updates to their firmware when it's available. (Recall that firmware consists of instructions stored on a ROM chip, so it is a combination of hardware and software.) To reinstall firmware on your own, however, you need to contact the manufacturer directly and then send the device to them for reinstallation.

QUICK TIP

Before you reinstall an operating system, you must back up your data files. Lesson 10 provides detailed instructions for creating backups.

ABOVE AND BEYOND

Desktop operating systems allow you to make a ***system recovery disk*** (typically a CD or DVD) to make sure you can start the computer and access recovery tools if something goes wrong with your operating system. Experts recommend that you create a system recovery disk right after you install or upgrade an operating system or purchase a new computer. The system recovery disk contains only files the operating system needs to start and the files to provide you with troubleshooting and system repair tools.

VOCABULARY

system recovery disk

Windows 8 includes the Refresh tool, which installs a fresh copy of Windows on your computer and retains your data, settings, and original Windows 8 apps, but not desktop applications. The Refresh tool is designed to reinstall Windows 8 if your system is unstable; that is, you can start the computer and run applications, but receive error messages or have trouble opening and using system tools. If you are having problems even starting Windows, you can use the Reset tool to remove all of your files and applications, reinstall Windows, and then change all of your system settings to their defaults. The Reset tool is also ideal if you are disposing of your computer or giving it away because it removes all of your data and personal information.

While using the Refresh or Reset tool, Windows needs to access setup files stored on its installation or recovery medium. You can use the original installation medium (such as the USB drive or DVD containing the setup program and files) or a system recovery disk if you made one during the original installation of the operating system.

In Step-by-Step 7.3, you learn about the Refresh and Reset tools in Windows 8, which you can access on the PC settings screen. If you are in a computer lab, you probably cannot access the Refresh and Reset tools. In that case, read but do not perform the following steps.

Step-by-Step 7.3

1. On the desktop, display the Charms bar, and then click the **Settings** charm.
2. Click **Change PC settings** on the Settings menu to display the PC settings screen.
3. Click **Update and recovery** in the left pane to display the Update and recovery options.
4. Click **Recovery** in the left pane to display the Refresh tool, which is titled "Refresh your PC without affecting your files," in the right pane. See **Figure 7–13**. (You will not refresh your computer at this time.)

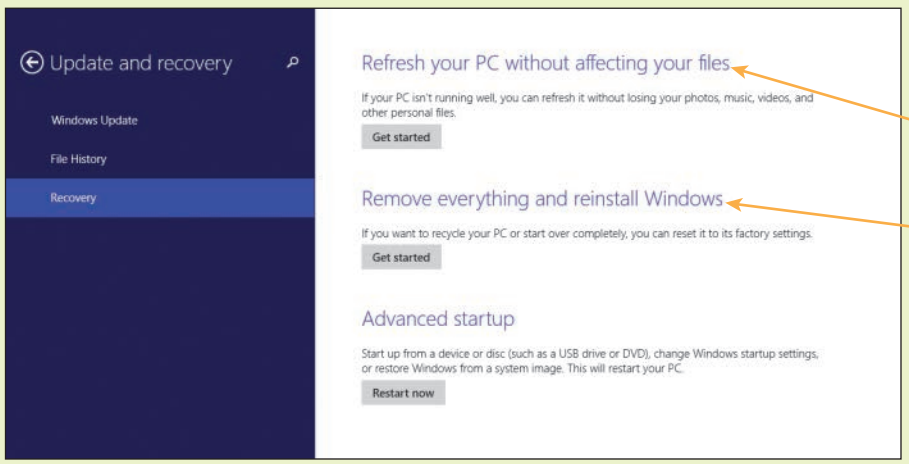


FIGURE 7–13
Refresh and Reset tools

5. Press the **Alt+F4** keys to close the PC settings screen and return to the Start screen.

WARNING

Be sure to close the PC settings screen without making any selections. Starting the refresh or reset process without completing it could make your system unusable.

1-3.2.1
1-3.2.2
1-3.2.3
1-3.2.4

Understanding Software Licenses

When you purchase software, you do not actually own the software. Instead, you are purchasing a ***software license***, a legal agreement that specifies how you can install and use the software. Most software is distributed using a ***single-user license*** (also called a *single-seat license*), which gives only one person the right to install and use the software.

Instead of a single-user license, some software is distributed using a ***site license*** (also called a *network license* or *volume license*), usually to organizations including businesses, educational institutions, and government agencies. With a site license, multiple users can access the software at the same time. The organization might install copies of the software on many computers or one copy on a server that can be accessed by many computers. A site license offers advantages to the organization and the software company. For example, if a single-user license for software costs $200, the software company might offer a site license for $100 per user. An organization with 10 employees pays $1,000 instead of $2,000, and the software company receives a large payment for the initial purchase and another for upgrades.

The software license is summarized in the ***end user license agreement (EULA)***, which is usually displayed as you install software, and outlines the terms and guidelines for your legal use of the software. It gives you the option to accept or reject the terms of the agreement. If you accept, you can continue to install the software. If you reject the terms, the installation does not continue. **Figure 7–14** shows a typical EULA.

VOCABULARY

software license

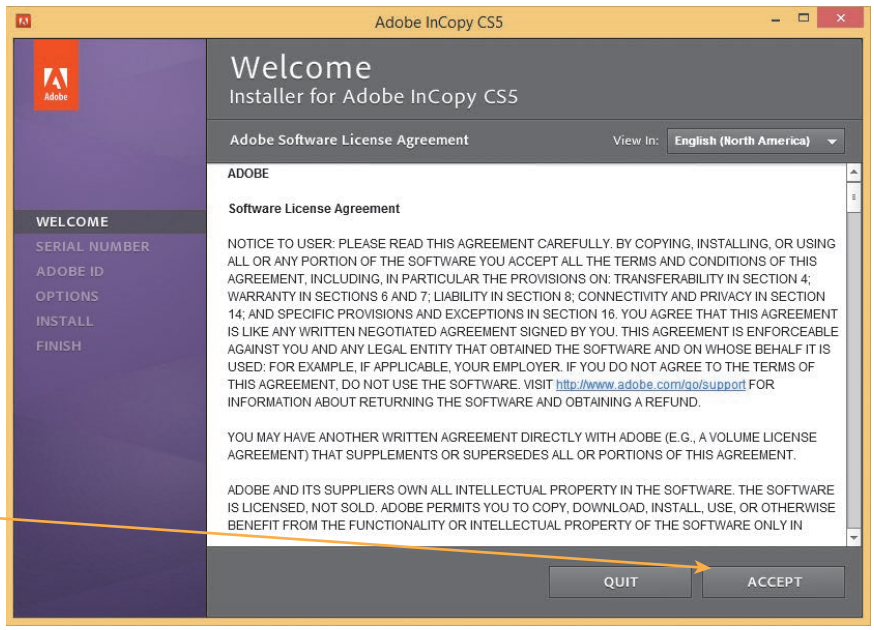
single-user license

site license

end user license agreement (EULA)

ABOVE AND BEYOND

Even if the software license does not include a notice such as © 2017, almost all software is protected by *copyright*, which gives authors, artists, and other creators of original work exclusive rights to duplicate, publish, and sell their material. Copyright law allows you to copy the software from its distribution location to your computer when you install it and to make a backup copy of the software. It is illegal to copy and distribute the software to other users unless the software license specifically allows you to do so.



Adobe product screenshot reprinted with permission from Adobe Systems Incorporated.

FIGURE 7–14 End user license agreement (EULA)

Be sure to read the EULA carefully so you understand your legal obligations. For example, some EULAs state that you can install the software on up to two computers that belong to the same person. Some might indicate that you are installing a student or academic edition and cannot use it for commercial or revenue-generating activities.

In addition to accepting the EULA during installation, you might also need to register or activate software after installing it. ***Software registration*** involves identifying yourself to the software manufacturer as the person who purchased a copy of the software. You usually complete an online form at the software company's Web site and provide your name and other personal information so you can receive product support and notices about upgrades. Software registration is optional. However, some software companies require you to ***activate*** your copy of the software, which often involves entering a serial number or activation key provided with the product packaging or electronic confirmation notice. Activation is a way that software developers can ensure you install the software only on the number of computers specified in the license. Many software developers let you use their software for a trial period, such as 30 days, to determine whether you want to purchase it. After the trial period, you must pay to activate the software or it will stop working. See **Figure 7–15**. Other types of trial software disable some features, such as the ability to save or print documents.

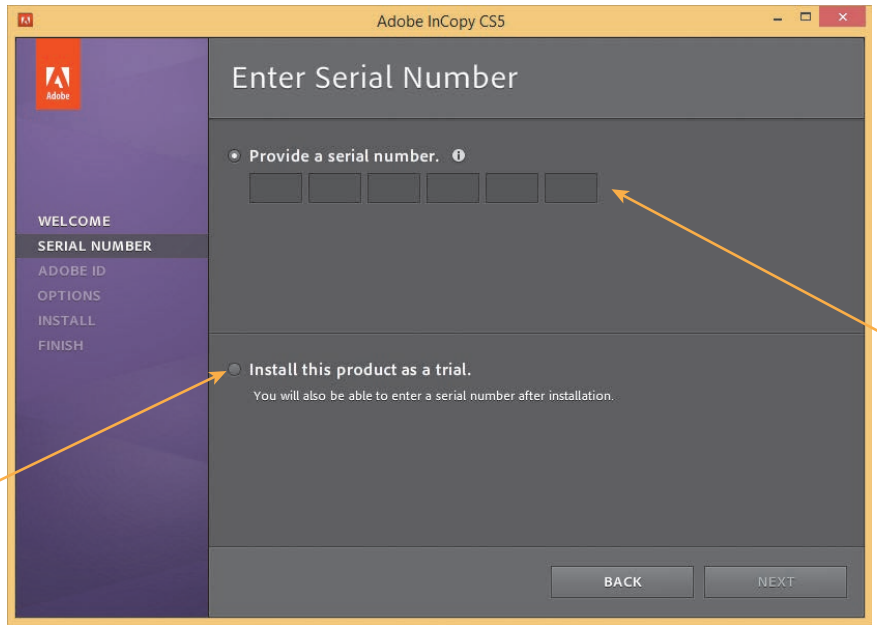
QUICK TIP

You can read the EULA for most software even after you install it. In Microsoft Office applications, for example, you can click the FILE tab, click Account, click About *application*, such as About Word, and then click View the Microsoft Software License Terms.

VOCABULARY

software registration

activate



Adobe product screenshot reprinted with permission from Adobe Systems Incorporated.

FIGURE 7–15 Activating software

ETHICS IN TECHNOLOGY

Software Piracy

Illegally copying and distributing software is called *software piracy*. According to the Business Software Alliance (BSA), more than $11 billion is lost to software piracy each year. Types of software piracy include copying a game on removable media and giving it to a friend; sharing license or activation codes; downloading software posted online by another user without authorization; and counterfeiting software (duplicating and reselling software as if it were original). Besides violating copyright law, software piracy harms the software developer through the loss of revenue and the incentive to create new software or improve an application. In addition, counterfeit software typically contains flaws that affect the reliability of the software. Some flaws are actually malware intended to surreptitiously access computer data such as passwords and credit card numbers. On the other hand, respecting copyright and the terms of software licenses rewards people and companies that produce quality software and stimulates technological innovation.

ABOVE AND BEYOND

When visiting any type of Web site, be wary of ads that include a software Download button. The software in these ads might contain malware. You should only download software from an established software download site, or from the software manufacturer's Web site. Research software and download sites before you use them to learn what experts and other users report or recommend.

VOCABULARY

shareware

The people and organizations that develop software determine how to make it available to users, such as selling it through retail stores and Web sites, so it earns a profit, or providing it free or for a nominal fee that covers distribution expenses. Developers can make software available to users in the following forms, and each of these forms has a specific software license:

- *Commercial software*—Commercial software is developed and sold for profit usually through retail stores and Web sites. Operating systems such as Windows and Mac OS X are commercial software, though they come preinstalled when you purchase a computer. Some commercial software, such as a Web app, is provided on a subscription basis so you pay a monthly fee to use the software under the terms of the software license.

  Custom software is a type of commercial software that is not sold in retail outlets. Instead, an organization contracts with one or more programmers or a programming company to develop software that fits the organization's unique needs. Custom software is sold only to the organization that contracted for it, and has a license that indicates the organization cannot resell the software or distribute it outside of the organization.

- *Shareware*—***Shareware*** is distributed free of charge as a download on the Web, often by single programmers who want to distribute their software independently without packaging or advertising expenses. After using shareware for a trial period, you pay the developer a small fee to continue using it. For this reason, shareware is sometimes called try-and-buy software. In most cases, payment is on the honor system; the software continues to run if you do not pay. Some developers let you set the price of the shareware depending on how valuable it is to you. Shareware licenses usually let you share the software by copying it and giving it to others to evaluate. Those users are also expected to pay the developer if they decide to continue using the software.

- *Freeware*—As the name suggests, ***freeware*** is software the developer makes available to users free of charge. As with shareware, the developer is usually a single programmer who provides the software as a download on the Web. The developer still owns the rights to the software, which means you cannot sell or modify it unless the license expressly permits you to do so.
- *Open-source software*—As mentioned in Lesson 1, open-source software is created in a collaborative programming effort and released under a license that allows anyone to use, modify, and distribute the software. Linux and Android are examples of open-source operating systems. Open-source applications include Thunderbird (for e-mail) and Firefox (for Web browsing).
- *Public domain software*—***Public domain software*** is the only type of software that is not copyright-protected. The software developer has either donated it for public use or the copyright has expired. You can freely copy, distribute, and even resell public domain software, though you cannot apply for a copyright on it.

VOCABULARY

freeware

public domain software

SUMMARY



In this lesson, you learned:

- When you install software, you use a setup program to guide you through the steps of copying the software from its distribution location to your computer, and then preparing the software so you can use it.
- The method you use to install software varies depending on the type of personal computer you are using, the type of software you are installing, and how you access it. You typically install four types of software: desktop applications, Windows 8 apps, mobile apps, and utility programs such as drivers. You obtain the software one of three ways: CD or DVD, a compressed file on a Web site, or a store app.
- To install software, a setup program copies and extracts files, checks for existing versions of the software, verifies system requirements, finds drivers and other system files, updates system files, and provides a way to start the software.
- To uninstall a desktop application from a Windows computer, you use an uninstaller, which is a tool similar to a setup program that completely removes software from your system. To uninstall a Windows 8 app or mobile app, you use an Uninstall command.
- You might need to uninstall a driver if a hardware manufacturer instructs you to do so. You can also uninstall utility programs if you no longer use them. In these cases, you should use an uninstaller provided by the software to uninstall the software from your computer so you can remove the files as safely as possible.
- You rarely need to uninstall an operating system, though you might want to uninstall one when you are preparing to recycle a computer and need to remove any personal information such as passwords stored in system files.
- When you use an uninstaller, it deletes the software's files, restores system settings, and restores the graphical user interface.
- If you've installed software but it's not running properly, you can reinstall it. Reinstalling can replace files that might have become corrupted during or shortly after installation.
- If a threat such as an electrical storm causes problems severe enough to prevent your operating system from running normally, you can reinstall the operating system. In most cases, you can use an option to install a fresh copy of the operating system while retaining your data and settings.
- To reinstall an operating system, the computer needs to access setup files stored on the installation or recovery medium. Most desktop operating systems let you create a system recovery disk, which contains tools and files to help restore a computer if a serious system error occurs.
- When you purchase software, you do not actually own the software. Instead, you are purchasing a software license, a legal agreement that specifies how you can install and use the software. Most software is distributed using a single-user license, which gives only one person the right to install and use the software.
- Some software is distributed using a site license, which allows multiple users to work with the software at the same time. An organization might purchase a site license to install copies of the software on many computers or one copy on a server that can be accessed by many computers.
- The software license is summarized in the end user license agreement (EULA), which is displayed as you install software. If you accept the terms of the agreement, you can continue to install the software. If you reject the terms, the installation does not continue. You should read the EULA carefully so you understand your obligations as a user of the software you are installing.

- After installing software, you might need to register or activate it. Software registration is optional and involves identifying yourself to the software manufacturer as the person who purchased a copy of the software. You can then receive product support and notices about upgrades. Software activation might be required, and involves entering a serial number or activation key to ensure that you install the software only on the number of computers specified in the license.
- Many software developers let you use their software for a trial period to determine whether you want to purchase it. After the trial period, you must pay to continue using the software.
- Software developers can make the software available to users in many forms, including as commercial software, shareware, freeware, and open-source software. Each of these forms has a specific software license.
- Public domain software is the only type of software that is not copyright-protected, which means that you can freely copy, distribute, and even resell public domain software, though you cannot apply for a copyright on it.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The best way to uninstall a Windows desktop application is to delete its program folder.

T F 2. During installation, the setup program checks to make sure your computer meets the software's minimum system requirements.

T F 3. Freeware is free of copyright restrictions.

T F 4. Uninstalling and then reinstalling software is often an effective way to solve the problem of corrupt or missing files.

T F 5. When you purchase software, you are purchasing a software license, not the software itself.

MULTIPLE CHOICE

Select the best response for the following statements.

1. _____ is developed and sold for profit through retail stores and Web sites.
   A. Public domain software C. Shareware
   B. Commercial software D. Setup software
2. A(n) _____ is software specifically designed for a handheld computer, such as a tablet or smartphone.
   A. handheld app C. online app
   B. mobile app D. desktop application
3. When installing software on a Windows computer, configuration data provided by the setup program is stored in the _____.
   A. program folder C. registry
   B. end user license agreement (EULA) D. folder containing the extracted setup files
4. Most software is distributed using a _____ license, which gives only one person the right to install and use the software.
   A. single user C. network
   B. single time D. site
5. A(n) _____ is included with software to guide you through the installation steps and prepare the software for use on your computer.
   A. end user license agreement (EULA) C. setup program
   B. uninstaller D. driver

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What are the three factors that determine the method you use to install software?

2. How do you install software provided in a compressed file on a Web site?

3. What are the seven tasks a setup program typically performs to install software?

4. After you download and install a Windows desktop application such as Free Alarm Clock, how can you verify it has been installed successfully?

5. What are two reasons to uninstall application software?

6. How do you start an uninstaller to uninstall software from a Windows computer?

7. In what types of situations might you want to reinstall an operating system?

8. What is the difference between a single-user license and a site license?

9. Why do some software developers require you to activate their software?

10. What is the difference between shareware and freeware? What are their similarities?

PROJECTS

PROJECT 7–1



1-3.1.1

In this project, you download and install Stickies, a Windows desktop application that lets you attach electronic sticky notes to the desktop. You take a screenshot when you install the software. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshot as your instructor requests.

1. If necessary, click the **Desktop** tile on the Start screen to display the desktop.
2. Start Internet Explorer, and then go to the Stickies home page at **zhornsoftware.co.uk/stickies**.
3. Click the **Download** link in the left pane, and then click the **Download Stickies 7.1e setup program (1052kb)** link. (The version and size on your Web page might differ.)
4. When a message box appears, click the **Run** button. When a User Account Control dialog box appears, click the **Yes** button.
5. Install the application with the default settings by clicking the **Install** button, and then respond to the prompts.
6. When the Stickies Help window and a sample sticky note appear, indicating you have successfully installed the software, press the **Print Screen** keys to capture an image of the desktop, and then save the image as a Paint file named **Stickies**.
7. Click the **Finish** button.
8. Display the Charms bar, click the **Search** charm, and then search for **stickies** to verify that Stickies is installed on your computer.
9. Close all open windows, including the sample sticky note.

PROJECT 7–2



1-3.1.2

In this project, you uninstall the Stickies application from your computer, which you installed in Project 7–1. You take screenshots as you perform the steps. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. Open the Control Panel, and then click **Uninstall a program** in the Programs category.
2. In the Programs and Features window, click **Stickies 7.1e** in the list of installed software, and then press the **Alt+Print Screen** keys to capture an image of the Control Panel window. Save the image as a Paint file named **Programs and Features**.
3. Click the **Uninstall** button on the toolbar to uninstall the software.
4. Verify that the Stickies application is not installed on your computer by displaying the Charms bar, clicking the **Search** charm, and then typing **stickies**.
5. With the Search menu open, press the **Print Screen** key to capture an image of the search results, and then save the image as a Paint file named **Uninstalled**.
6. Close all open windows.

PROJECT 7–3



1-3.1.3

In this project, you visit the Google Play store, the online store for Android tablets and smartphones, to learn about reinstalling mobile apps on an Android device. As you explore the information, you answer questions about what you learned. Some steps require you to perform new tasks or solve problems independently. Submit the written answers as your instructor requests.

1. Start Internet Explorer, and then go to the Google Play home page at **play.google.com**.
2. Click the **Help** button to display a Search Help box. (*Hint*: The Help button is near the upper-right part of the page and displays a question mark.)
3. In the Search Help box, enter **reinstall** to display Help topics about reinstalling mobile apps available on Google Play.
4. Click the **Uninstalling Android apps** topic. Read the topic to answer the following questions:
   - What types of apps can you reinstall?
   - How do you reinstall an app from the Google Play store?
5. Return to the search results, and then click a link to a topic that explains how to download previously purchased and downloaded apps. Read the topic to answer the following questions:
   - In what situations might you want to reinstall a mobile app available on the Google Play store?
   - Do you need to purchase the mobile app again before reinstalling it?
   - How can you find and download a mobile app from the Google Play store using a mobile computer?
6. Close Internet Explorer.

TEAMWORK PROJECT

You work for a small business that writes and edits Web site content for other companies. The business has seven employees that work from home most of the time. Your manager wants to install the latest version of Microsoft Office on each employee's computer and asks you and another team member to research the Microsoft Office license agreement to learn about the legal terms of the license. Work as a team of two to complete the following steps.

1. Start a Microsoft Office application such as Word, click the **FILE** tab, click **Account** in the left pane, and then click the **About Word** button in the right pane to display the About Microsoft Word dialog box.
2. Click the **View the Microsoft Software License Terms** to display the license agreement. Scroll through the agreement and assign each of the following sections to a team member:
   - Retail License Terms (up to "Additional Terms")
   - Additional Terms
   - Activation
   - Proof of License
   - Limited Rights Versions
   - Support and Refund Procedures
3. Read your assigned sections, and then meet as a team to answer the following questions:
   - What should you do if you do not accept the terms in the agreement?
   - Under what conditions can you allow another user on a remote computer to access the Microsoft Office software at the same time you are using it?
   - How does Microsoft activate your copy of Office if your computer is connected to the Internet?
   - What is your proof of license if you acquired the software in a physical package?
   - What are the restrictions for using software marked as "University," "Academic Edition," or "AE"?
   - Where can you find information about support services to properly licensed Microsoft products?
4. Submit the written answers as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 7–1

Because public domain software is rarely advertised, not much is known about applications released as public domain software. Complete the following.

1. Visit at least two Web sites to find information about public domain software in general and about specific public domain applications. Answer the following questions:
   - According to the Free Software Foundation, how is the phrase "public domain" sometimes used incorrectly?
   - What was a common way to share public domain software in the 1980s?
   - What is the Unlicense?
   - What is the difference between open-source software and public domain software? Why should you be aware of this difference as a software user?
2. Submit your responses as your instructor requests.

CRITICAL THINKING 7–2

As described in the Ethics in Technology box in this lesson, software piracy is a major concern of people and companies that develop software. Complete the following.

1. Visit Web sites as necessary to find information about software piracy and answer the following questions:
   - What is intellectual property? Is software intellectual property?
   - What is Apple's stance on software piracy?
   - What types of anti-piracy efforts does the Software Information Industry Association (SIIA) conduct?
2. How would you describe the purpose of copyright law as it relates to software?
3. Why is software piracy considered a crime?
4. Are you guilty of piracy any time you make a copy of software?
5. Submit your responses as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 7–1

IC³ 1-3.1.1

Use online resources to answer the following questions about installing software. Submit the written answers as your instructor requests.

1. What is bundled software? What advantage does it offer users? What drawbacks does bundled software have?
2. What is an unattended installation? Why might you want to perform an unattended installation?
3. What is a clean install? When would you perform a clean install of an operating system?
4. What are the top five troubleshooting tips Apple offers for people having trouble installing software on a Mac?

ONLINE DISCOVERY 7–2

IC³ 1-3.2.1

Although some Web sites where you can download freeware and shareware are not safe, many sites are legitimate venues for developers to share their software with users. Research online resources to find the Web sites that experts such as software reviewers recommend for freeware and shareware, and then answer the following questions. Submit the written answers as your instructor requests.

1. What should you look for when selecting a software download site?
2. Why do some experts recommend the SnapFiles Web site for downloading software?
3. Name two sites that experts recommend for system tools and utilities.
4. What do experts report about the Tucows download site?

JOB SKILLS

If you work for a medium-sized or large company, you are likely to use software designed to meet the particular objectives of the organization. This type of software is called enterprise software. You can prepare yourself for a professional workforce by learning about enterprise software. Complete the following steps.

1. Use online resources to research enterprise software. What are typical types of enterprise software?
2. Research one type of enterprise software and describe how an organization typically uses it.
3. Submit your findings to your instructor as requested.

EXPLORE AND SOLVE

Did you know?

- You can restore Windows to undo recent system changes.
- You can create a restore point to use when restoring your system.

1. Open the Control Panel, click **System and Security**, and then click **System** to open the System window.
2. In the left pane, click **System protection** to open the System Properties dialog box. Make sure that System Protection is turned on for the system drive, the internal hard drive where Windows 8 is installed on your computer, which is most likely drive C.
3. Press the **Alt+Print Screen** keys to capture an image of the System Properties dialog box, and then save the image as a Paint file named **System Properties**.
4. Click the **Create** button to open the System Protection dialog box.
5. Type your first name as the description for this restore point. Windows will add the current date and time automatically.
6. Click the **Create** button. Windows creates a restore point, which might take a few minutes, and then displays a message indicating it was created successfully.
7. Press the **Alt+Print Screen** keys to capture an image of the System Properties dialog box and the message, and then save the image as a Paint file named **Restore Point**.
8. Submit your screenshots as your instructor requests.



Estimated Time:
1.5 hours

LESSON 8

Software Usage

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Define productivity software.
- Describe word-processing, desktop publishing, and presentation software.
- Compare spreadsheet and database software.
- Describe entertainment and media-editing software.
- Use typical software tools for maintaining a computer.

DATA FILES

Creativity.pptx

Media1.png

Media2.wav

Media3.mp4

Presentation Tips.pptx

WORDS TO KNOW

algorithm

bad sector

bot

clip

cluster

computer-aided design (CAD) software

database

field

formula

frame

function

layout

lossless compression

lossy compression

lost cluster

primary key

query

record

sector

software suite

spyware

virus

what-if analysis

Microsoft product screenshots used with permission from Microsoft Corporation.

In this lesson, you learn about the purpose and use of application software, including word-processing applications, presentation software, spreadsheets, and databases. You also examine applications for desktop publishing, entertainment, and media editing. Finally, you explore typical utility programs, including those that compress files, manage disks, and scan for malware.



1-3.3.2
1-3.3.3
1-3.3.4
1-3.3.5
1-3.3.6
1-3.3.7

Using Application Software

The range of application software covers nearly every task you might need to perform, including producing documents and other types of work, exchanging electronic messages, accessing Web pages, watching movies, and playing games. In this lesson, you explore three types of applications: productivity, entertainment, and media-editing applications. You use productivity applications to perform work and other activities effectively. Productivity applications include word processing, spreadsheet, database, desktop publishing, and presentation software. Entertainment software is designed for viewing or playing music, videos, and photos, while media-editing software is designed for creating and modifying graphics, animations, video, music, and other media.

Related applications are often packaged together and distributed in a ***software suite***. For example, Microsoft Office, Apple iWork, Google Docs, and Apache OpenOffice are considered office suites because they typically include word-processing, spreadsheet, and presentation applications that are useful in a professional or business setting. Many office suites also include a database or an e-mail application. Media-editing applications can also be provided in suites such as Adobe Creative Suite and CorelDRAW Graphics Suite, which include software for editing photos, creating graphics, and developing animations.

Software suites offer some advantages over installing individual applications. The cost of a software suite is usually less than the cost of buying each application separately. The software in a suite uses the same interface, so you can apply the skills you learn in one application to the other applications. Suite software is also designed to work together, often by sharing content. For example, in an office suite, you can copy a chart created in a spreadsheet and paste it in a word-processing document. A disadvantage is that many people use one or two suite applications most of the time, while rarely using the others, so the disk space consumed by the suite overall is not used efficiently.

VOCABULARY
software suite

QUICK TIP

Some applications are available as Web applications, which you access by connecting to the Internet and then using a browser to interact with the software. Other applications are native applications, which you install on your computer and access using the tools provided by the operating system.

Word-Processing Software

You use word-processing software such as Microsoft Word, Apple Pages, Google Document, and Corel WordPerfect to produce written documents such as reports, letters, memos, research papers, and flyers. As you are working on a document, you can enter and reorganize text, correct errors, insert graphics, and format the document before producing a final version.

A typical word-processing application such as Microsoft Word, shown in **Figure 8–1**, displays a work area where you create and edit a document along with controls for viewing, formatting, and managing the document.

QUICK TIP

This lesson presents an overview of application software; you work extensively with Microsoft Office applications such as Microsoft Word in Module 2.

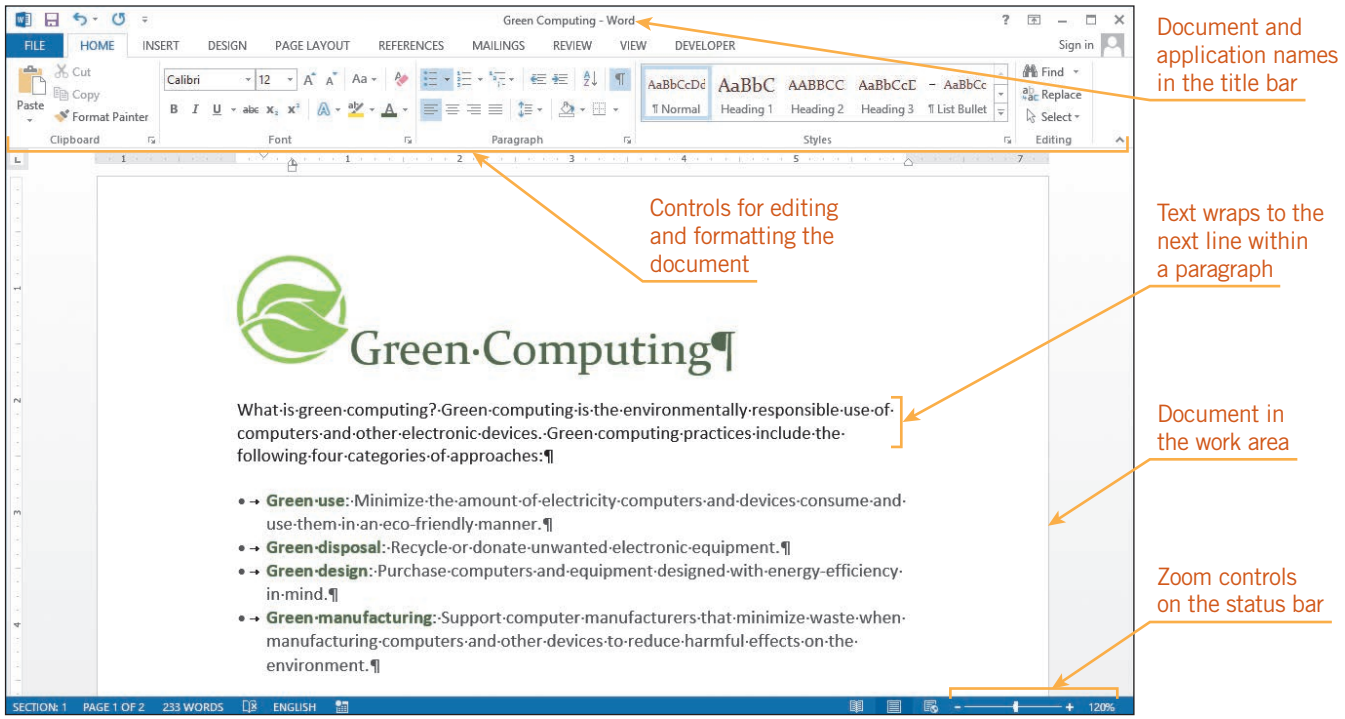


FIGURE 8–1 Word-processing application

Writing and Editing Features

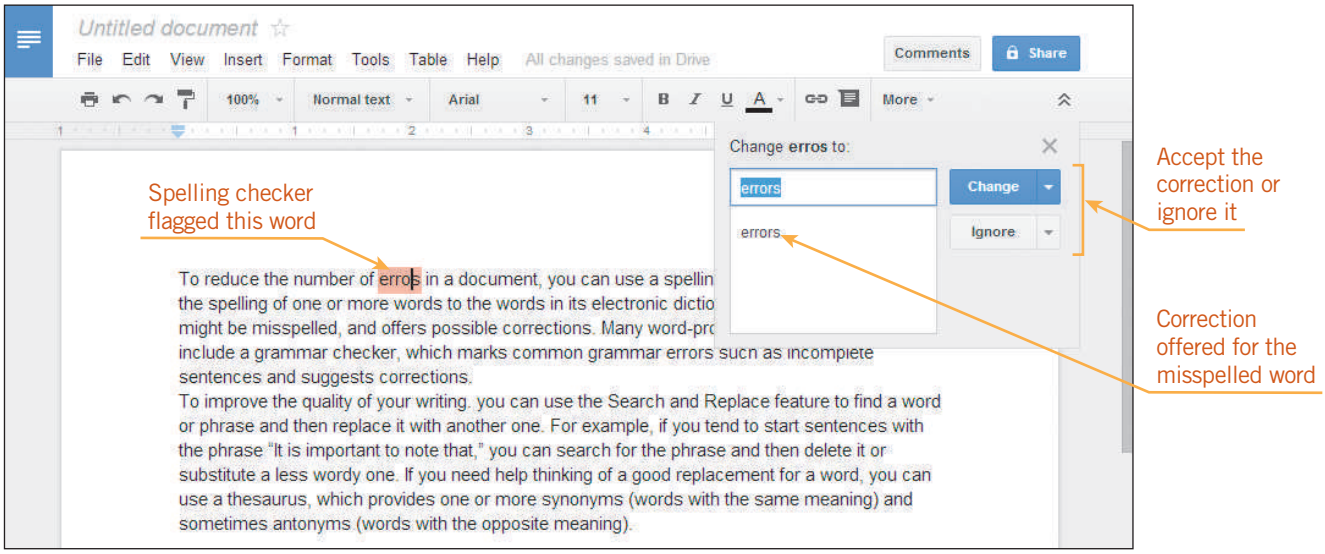
Word-processing software is popular because it lets you enter and change your written words easily. A feature called ***word wrap*** keeps text within the document margins. When the text you are typing fills a line, word wrap moves the text to the next line, without requiring you to press the Enter key. If you add text to a paragraph, word wrap reflows the paragraph to accommodate the new text. If you change the margins, word wrap also adjusts the paragraph so that all the text remains within the new margins.

VOCABULARY

word wrap

VOCABULARY
spelling checker
grammar checker
formatting

To reduce the number of errors in a document, you can use a ***spelling checker***, which is a feature of a word-processing application that compares the spelling of one or more words to the words in its electronic dictionary, flags the ones that might be misspelled, and offers possible corrections. **Figure 8–2** shows the spelling checker in Google Document. Many word-processing applications also include a ***grammar checker***, which marks common grammar errors such as incomplete sentences and suggests corrections. A similar feature available in some word-processing applications is a thesaurus, which provides one or more synonyms (words with the same meaning) and sometimes antonyms (words with the opposite meaning) for a selected word.



Courtesy of Google

FIGURE 8–2 Spelling checker

The Search or Find feature in word-processing applications is especially useful if you are working with a long document and you need to locate a specific word or phrase. You can use the Replace feature with the Search or Find feature to quickly locate an individual instance or all instances of a word or phrase and then replace it with another one. For example, if you are writing a report for your company, and you want to use the acronym for the company instead of the company's full name throughout the report, you can use the Search and Replace features to locate all instances of the full company name, and replace those with the company's acronym all at once.

Formatting Features

Word-processing applications provide formatting features so you can make documents look professional and appealing. ***Formatting*** refers to the appearance and arrangement of elements on a page. For example, basic formatting features allow you to make headings larger than other text, insert bulleted lists, apply color to text and other elements, and change the margins of the page. You use more advanced formatting features to place text and graphics side by side, arrange text into newspaper-style columns, and add shadows to words and shapes.

Collaboration Features

Because groups of people work together to produce many of the documents in professional and academic settings, word-processing software provides features that make it possible to collaborate. For example, one or more people can review a Microsoft Word document and insert personalized comments or mark their changes so the author can track them. Using Google Document, you can post a document online and invite others to edit it in real time. Most word-processing applications include tools to easily share documents via e-mail, a cloud storage location such as SkyDrive or iCloud, or a blog. (A ***blog***, short for *web log*, is a Web site where one or more authors regularly post commentaries, opinions, and other personal information.)

VOCABULARY

blog

frame

sidebar

IC3

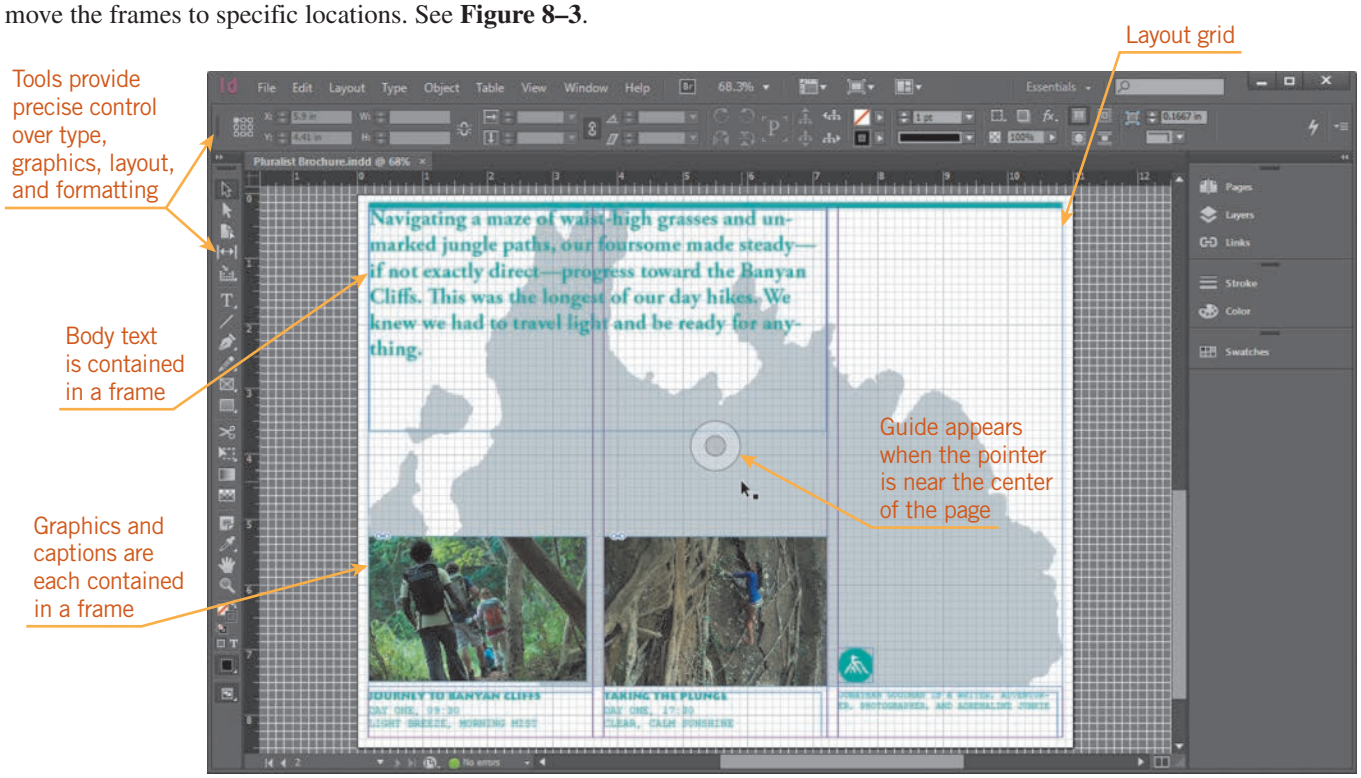
1-3.3.3

Desktop Publishing Software

Desktop publishing (DTP) software is similar to word-processing software because you use it to create documents containing text and graphics. However, DTP software includes more sophisticated features that enable you to use a personal computer to arrange text and graphics on a page to create and print high-quality documents such as brochures, magazines, newspapers, and books that would typically be produced by professional typographers. Adobe InDesign, QuarkXPress, and Microsoft Publisher are examples of DTP software.

Layout Features

When you work with DTP software, you use ***frames***, which are movable rectangular areas on a page in which you enter text or graphics. One page usually has many frames, such as a frame for the title, one or more for the body text, additional frames for photos and graphics, and others for captions or sidebars. (A ***sidebar*** is a short article, often appearing in a box, that appears alongside a main article or other content to provide additional explanation or supporting material.) To lay out a page, you move the frames to specific locations. See **Figure 8–3**.



Adobe product screenshot reprinted with permission from Adobe Systems Incorporated.

FIGURE 8–3 Desktop publishing software

As you move a frame, you can use layout grids, guides, and snapping to place the frame precisely. These tools appear on-screen only, not on the printed page. A layout grid divides the page into columns and rows and looks like graph paper. You can use a layout grid to place a frame precisely and to balance the text and graphics on the page. A guide is usually a colored line or shape that appears to help you align an object to the layout grid or to other objects. If you drag a frame close to a guide and then release the mouse button, the snapping feature aligns the frame to the grid or the other object.

Text Features

Besides basic text-editing features, DTP software lets you thread, or link, frames that contain text. Using this feature, you can display part of an article on one page, for example, and then continue the article on the next page, an arrangement that's not possible without linking the frames. As you edit content, the frames adjust their text so it flows between frames without interruption.

Publications often need to control the amount of text that fits on a line or column to avoid errors such as printing the last two lines of an article on an otherwise blank page. They do so by controlling the word spacing, letter spacing, text alignment, and hyphenation, which is called text composition. DTP software includes tools that track text composition, highlight problems, and then let you fine-tune letter spacing, for example, to solve the problems.

Graphics Features

In addition to manipulating graphics by resizing shapes or cropping photos, for example, DTP software includes tools for creating, editing, and enhancing graphics. You use these tools to draw lines and shapes, add color to some or all parts of an illustration, specify colors for professional printing, and apply effects such as transparency, shadows, and spot lighting. Many DTP applications also provide a collection of graphics you can use in your publications.

Presentation Software

IC3
1-3.3.4
1-3.3.5

VOCABULARY
layout

You use presentation software, such as Microsoft PowerPoint, iWork Keynote, LibreOffice Impress, and Prezi, to organize and present text, graphics, and other media as a slide show. To guide you to create a slide show with visual appeal, presentation software provides ***layouts***, which are pre-set arrangements for slide content, including text and graphics. Layouts provide placeholders in which you can enter and edit text in formats that audiences can view and read easily, including headings and bulleted and numbered lists. You can also use placeholders to insert tables, charts, pictures, and videos. **Figure 8–4** shows an example of a slide show created in presentation software.

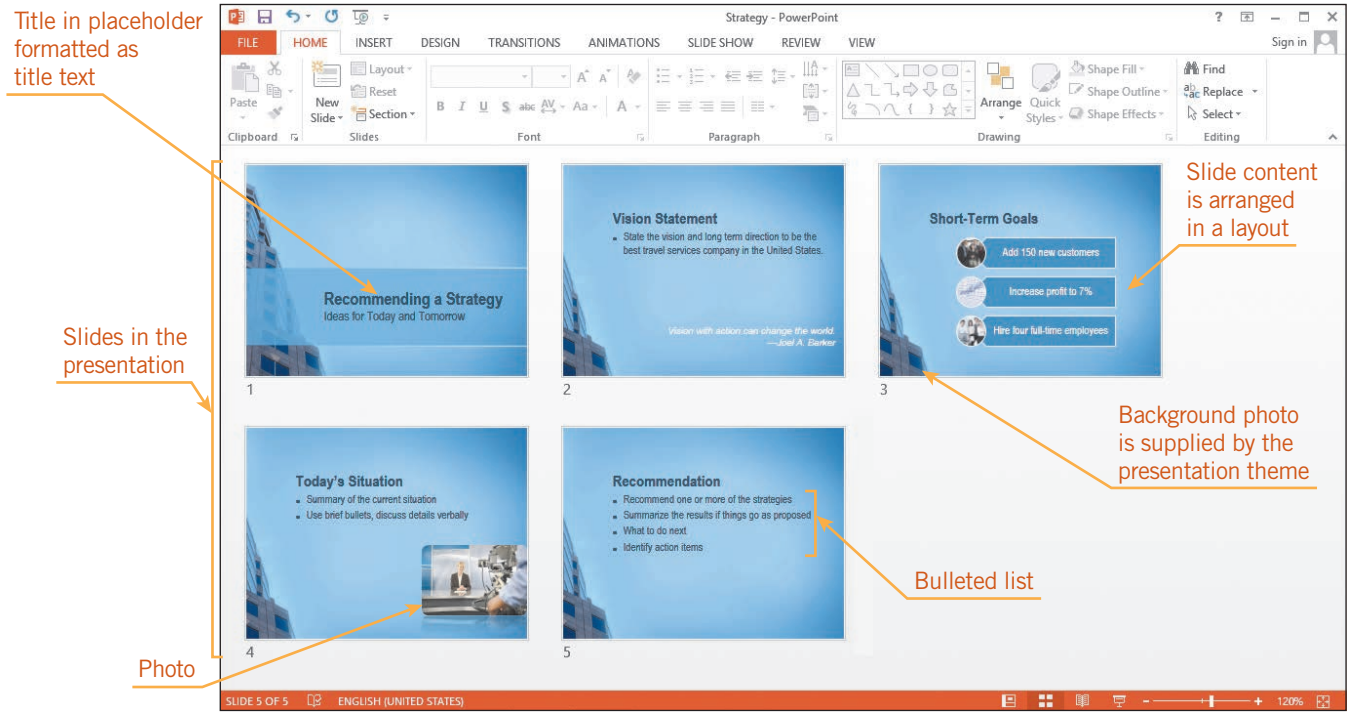


FIGURE 8–4 Presentation software

In addition to layouts, presentation software often includes premade designs, which are called themes in PowerPoint, and provide a coordinated set of colors, fonts, backgrounds, and effects. You can apply a theme to new and existing presentations.

While you are creating or editing a presentation, you can include transitions between slides, such as an effect that fades from one slide to the next. You can also animate text, shapes, photos, and other objects to draw attention to a topic or to demonstrate an action.

You can usually present a slide show online or in person to a live audience. During the slide show, you can change the display of the pointer so it appears as a laser pen or highlighter, for example, control the timing of the presentation, and play music or sound effects.

In Step-by-Step 8.1, you start PowerPoint and then view a presentation to become familiar with presentation software and the presentation elements you can create.

ABOVE AND BEYOND

The original presentation applications were designed to create physical 35-mm slides that you inserted in a slide projector. One of the first presentation applications for Windows was Harvard Graphics, initially released in 1986. At the same time, an application called Presenter was developed for the Mac. It was renamed PowerPoint, sold to Microsoft, and converted into a Windows desktop application. PowerPoint quickly became more popular than Harvard Graphics, and now claims about 95 percent of the presentation software market.

Step-by-Step 8.1

1. On the Start screen, click the **PowerPoint 2013** tile or begin to type **powerpoint** and then click **PowerPoint 2013** in the search results to start Microsoft PowerPoint and display the Recent screen. To create a presentation, you can click Blank Presentation in the right pane, or select one of the presentations that already has a theme applied, such as Retrospect, which also includes text, graphics, and placeholders that help you quickly create content. See **Figure 8–5**. Your Recent screen might display different options.

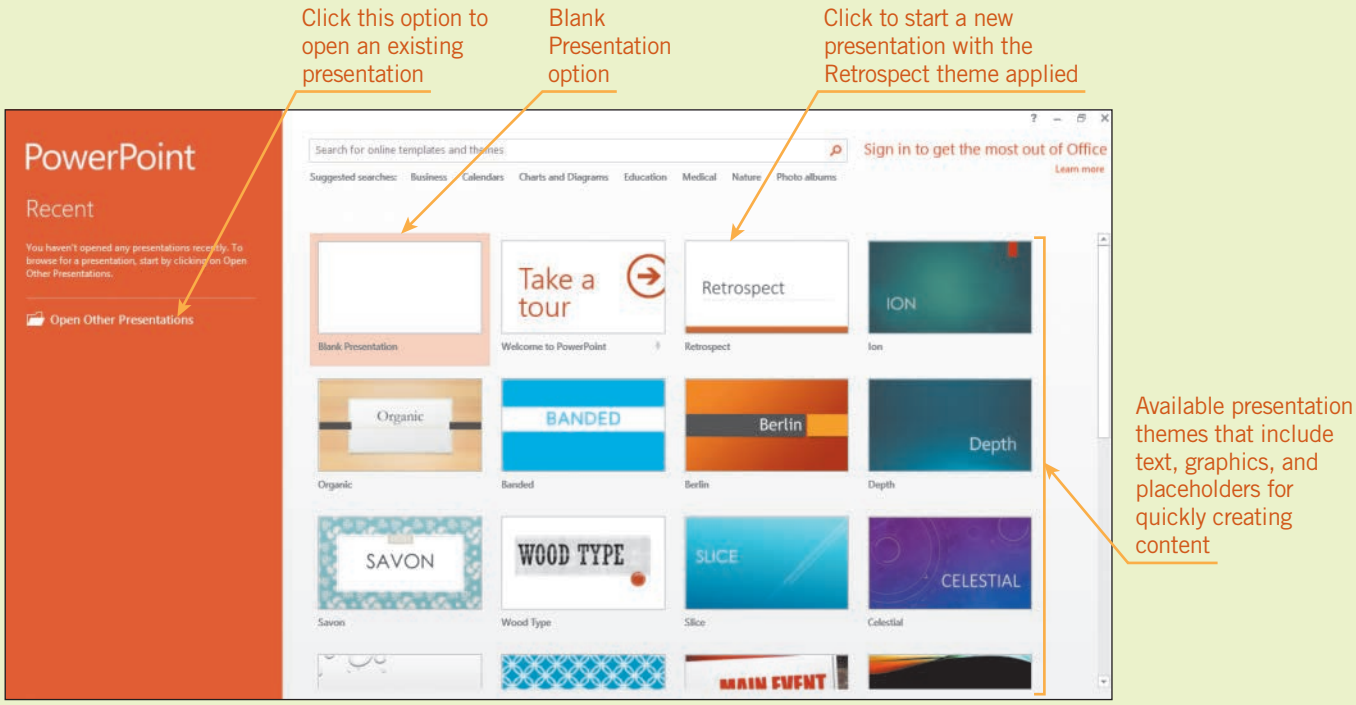


FIGURE 8–5 PowerPoint presentation themes

2. In the left pane of the Recent screen, click **Open Other Presentations** to display the Open screen, which lists locations where you might store presentations and includes any presentations you opened recently.
3. Click **Computer**, and then click the **Browse** button to display the Open dialog box.

4. Navigate to where you store your data files for Module 1, Lesson 8, click **Presentation Tips**, and then click the **Open** button. The Presentation Tips presentation opens in the PowerPoint window, with Slide 1 displayed in the Slide pane on the right. Thumbnails of the slides in the presentation are displayed in the Slides tab on the left. See **Figure 8–6**. The colors, fonts, and graphic at the bottom of each slide are part of the presentation theme.

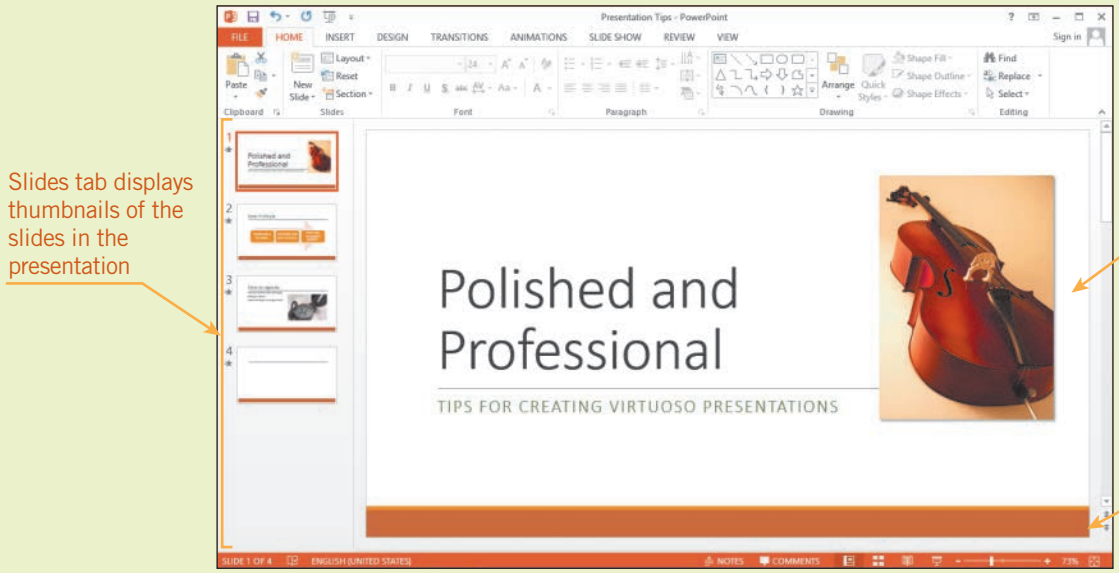


FIGURE 8–6
Presentation open in PowerPoint

5. In the Slides tab, click **Slide 2**. This slide includes a diagram that adds visual interest to the text.
6. In the Slides tab, click **Slide 3**. This slide includes a bulleted list on the left and a photo on the right. The arrangement of the slide title, bulleted list, and photo are determined by the slide layout.

7. In the Slides tab, click **Slide 4**. This slide includes only placeholders, not content. The first placeholder is for the slide title, and the second is for the slide content. See **Figure 8–7**.

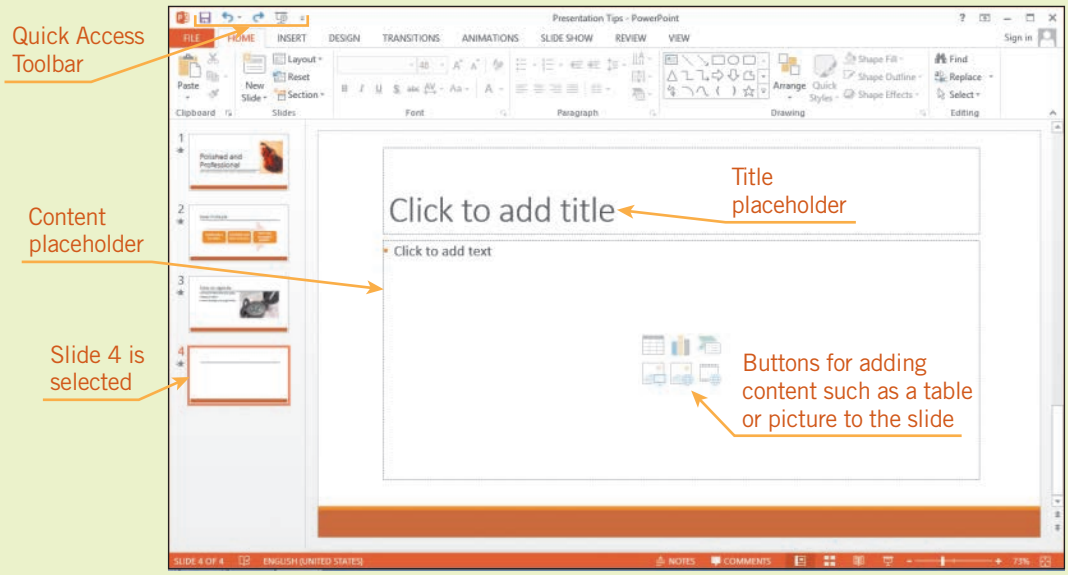


FIGURE 8–7
Slide with placeholders

8. Click the title placeholder, and then type **Main topics** as the slide title. The text appears in the size and font set by the presentation theme. You could use the same technique to insert a bulleted list in the content placeholder.
9. Point to the buttons in the middle of the slide to display their names. If you wanted to insert a table, for example, instead of a bulleted list, you could click the Insert Table button.
10. On the Quick Access Toolbar, click the **Start From Beginning** button to play the presentation in Slide Show view, which is the way an audience sees the slides.
11. Press the **spacebar**. After a brief transition, Slide 2 appears on the screen. Press the **spacebar** three more times to play the entire slide show, and then press the **Esc** key to end the slide show.
12. Click the **Close** button to close PowerPoint, and then in the message box that appears, click the **Don't Save** button to exit without saving your changes.

Spreadsheet Software

1-3.3.2

VOCABULARY

spreadsheet

worksheet

workbook

cell

active cell

A ***spreadsheet*** is an arrangement of text and numbers in a rectangular grid or table. You use spreadsheet software such as Microsoft Excel, Lotus 1-2-3, or LibreOffice Calc to organize numeric data in such a way that you can calculate, analyze, interpret, and present it. This type of software is ideal for tasks such as preparing budgets, balancing checkbooks, forecasting loan payments, and maintaining grade books.

A typical spreadsheet application such as Microsoft Excel, shown in **Figure 8–8**, displays a grid of columns and rows that can contain text, numbers, and formulas. Excel calls this grid a ***worksheet***, or a *sheet* for short.

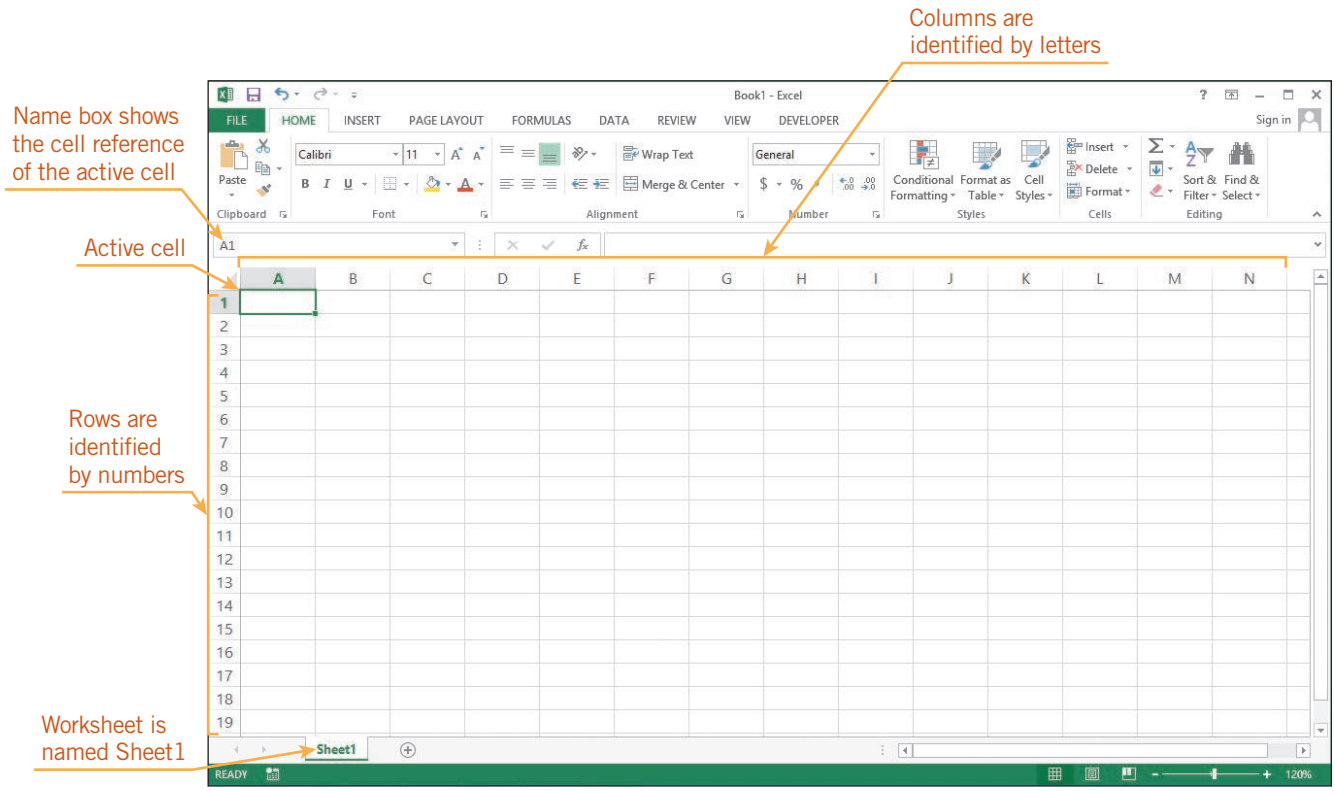


FIGURE 8–8 Spreadsheet application

When you start Excel, you create a file called a ***workbook***. By default each new workbook contains a worksheet named Sheet1. You can rename this worksheet and add new ones as you need them.

As shown in Figure 8–8, the columns in a worksheet are identified by letters and the rows are identified by numbers. The point where a column and a row intersect is called a ***cell***. Each cell has a name, called the cell reference (or cell address), which is represented by its column letter and row number. For example, the first cell in a worksheet is cell A1, which is located in column A and row 1. The ***active cell*** is the currently selected cell. To identify the active cell, look for the cell surrounded by a thick border. The Name box also displays the cell reference of the active cell, which is cell A1 in Figure 8–8.

Calculation Features

VOCABULARY
formula
what-if analysis
function

The main purpose of spreadsheet software is to perform calculations. You can enter a column of numbers, for example, and then insert a formula to display the total at the bottom. A ***formula*** is a mathematical expression that provides a result. To aid in recalculation, you use cell references in a formula whenever possible instead of numbers. That way, if you change one of the numbers in the column, the formula recalculates the result automatically and displays an updated total. See **Figure 8–9**.

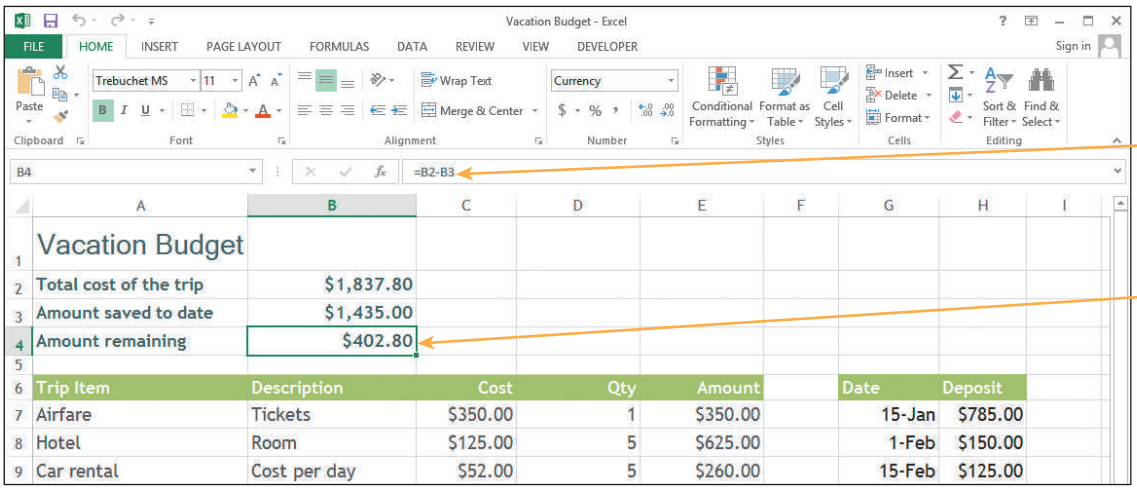


FIGURE 8–9 Spreadsheet with formulas

Because of this ability to update automatically, spreadsheets are especially useful when you need to perform ***what-if analysis***, which is a way to explore how changing numbers and other input values such as dates affect calculated results. For example, if you are saving money to take a vacation, you might use a spreadsheet like the one shown in Figure 8–9. You could use what-if analysis to answer questions such as "What if I saved $50 more per week? How soon would I save enough to take the vacation?"

Besides entering simple formulas, you can use ***functions***, which are predefined formulas that perform common calculations. For example, instead of entering a formula that adds five numbers in a column, such as =E7 + E8 + E9 + E10 + E11, you can use the SUM function =SUM(E7:E11), which is simpler and less prone to error. In the SUM function, "E7:E11" refers to the range of five cells from E7 to E11.

Charting Features

To help you analyze and present numeric data visually, spreadsheet software includes tools for creating charts (also called graphs). Charts show trends or relationships in data that you might not notice when examining columns or rows of numbers. For example, **Figure 8–10** displays a column chart of a student's grades in a Computer Literacy class. The chart clearly shows that the student is doing well on homework, but not on quizzes.

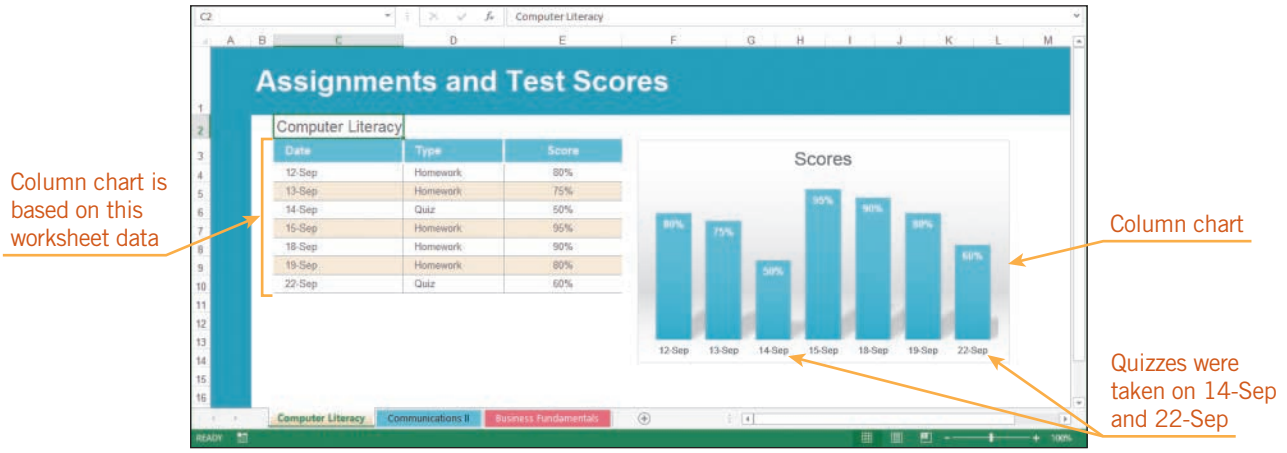


FIGURE 8–10 Chart in a spreadsheet application

Database Software

1-3.3.2

A ***database*** is a collection of data organized into tables, such as a collection of baseball cards, an inventory of movie and TV show DVDs, or an address book of contacts. You use database software such as Microsoft Access, FileMaker Pro, or MySQL (pronounced "my sequel") to enter, organize, update, retrieve, and produce reports on the electronic data in a database.

All of the data in a database is stored in one or more tables, which are composed of rows and columns, similar to spreadsheets. Each column in the table is a ***field***, which is a single characteristic of a person, place, thing, or event. For example, in the Movies table shown in **Figure 8–11**, Title is a field containing the name of each movie.

VOCABULARY

database

field

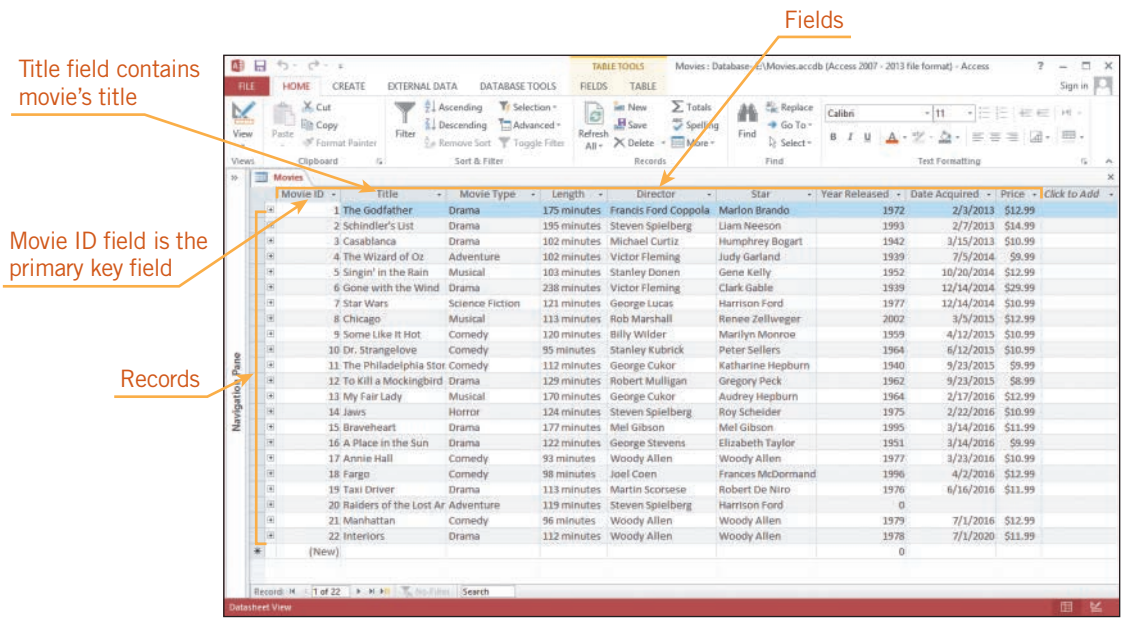


FIGURE 8–11 Database table

VOCABULARY
record
primary key

A row in a database table represents a ***record***. Each record is a group of related fields. For example, a record in the Movies table contains nine fields: Movie ID, Title, Movie Type, Length, Director, Star, Year Released, Date Acquired, and Price.

Every table must include a ***primary key*** field, which is a field that uniquely identifies each record in the table. For example, Movie ID is the primary key field in the Movies table. One purpose of the primary key is to prevent duplicate entries, so no two records can contain the same primary key value.

Database software that works with related tables, such as Microsoft Access, is called relational database software. For example, the Movies database stores movie data in one table, and it stores information about movie types in another table. The Movies table contains the fields shown in Figure 8–11. The Movie Type table has two fields: Movie Type ID and Movie Type. Because the Movie table also contains the Movie Type field, you can relate, or link, the two tables through their common field—the Movie Type field.

By linking, or relating the two tables, you can save time and make the database more consistent. When you enter data for a new movie, you can choose the movie type from a list to specify Science Fiction, for example. Without the list from the related table, you might enter *Sci Fi* or *Fantasy* instead, which would make the database inconsistent and create problems when you retrieve data.

Data-Entry Features

When you enter records of data directly into a table, you use a table datasheet, which is similar to a spreadsheet. Besides tables, a database file can contain other objects, which are containers for data. Instead of entering data directly into a table, you can use an object called a form. You can design forms so they are visually attractive and easy to use, which makes data entry more efficient. Forms can also display records from different tables. See **Figure 8–12**.

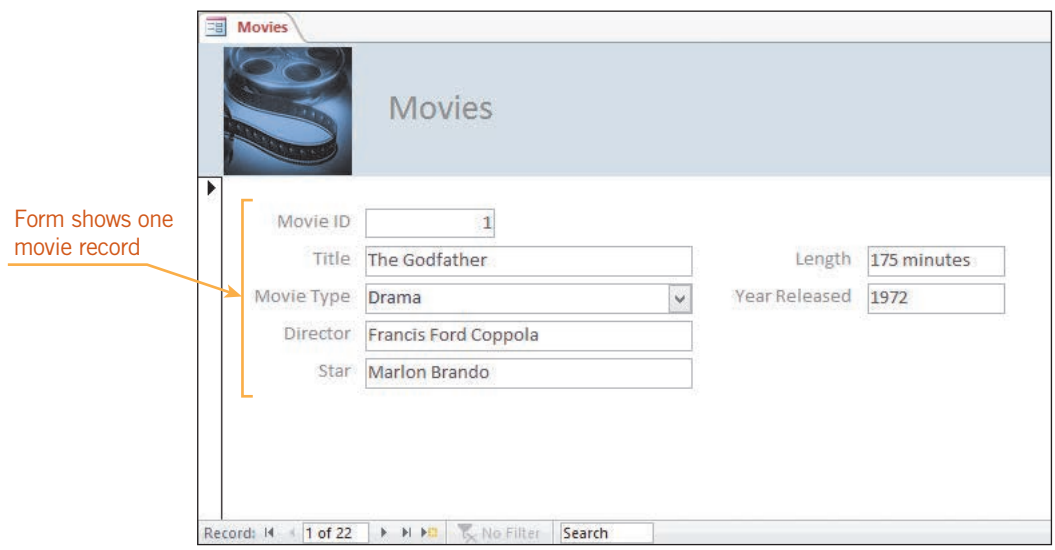


FIGURE 8–12 Database form

Data-Retrieval Features

To extract meaningful data from a database, you can create a ***query***, which is a request for specific data that meets set criteria. For example, you could create a query displaying all the movies in your database that star Woody Allen or those classified as comedies. Queries often provide the basis for reports, which are formatted printouts or displays of data. Both queries and reports can include calculations such as subtotals and totals.

VOCABULARY
query

Comparing Spreadsheets and Databases

IC3 1-3.3.2

Now that you have learned about spreadsheet and database software, you might be noticing their similarities. Both types of software are designed for organizing, managing, and tracking data that is initially entered and stored in columns and rows. How do you know when to create a spreadsheet and when to create a database?

Many people prefer working with spreadsheets because they let you enter data and see results after a short amount of setup time. Spreadsheet software is also easier to learn, especially for novices, and provides formatting features that databases usually do not. Most importantly, although both spreadsheets and databases perform calculations, spreadsheets typically offer more sophisticated mathematical functions than databases. If your focus is on using numerical data to make calculations or a quick analysis, create a spreadsheet.

However, if your focus is on storing other types of data for the long term and manipulating it efficiently, create a database. The advantages databases offer are the result of being able to relate tables to each other. For example, suppose you earn extra money providing pet care services. You want to keep track of owners, pets, the type of care they need, and so on. You could create a spreadsheet listing all of this information, as shown in **Figure 8–13**.

	A	B	C	D	E	F	G
1	Owner Name	Address	Phone	Pet Name	Pet Type	Care Requested	
2	Dale Franklin	228 S. Pine	(555) 235-8634	Maggie	Dog	Morning walks	
3	Dale Franklin	228 S. Pine	(555) 235-8634	Jake	Cat	Morning feeding	
4							

Duplicate data

FIGURE 8–13 Data in a spreadsheet

Dale Franklin has two pets, so you must enter his name, address, and phone number twice. If Dale moves or changes his phone number, you must remember to make that change in two places. You can avoid this data duplication by creating and relating two tables in a relational database, one for owner data and another for pet data. See **Figure 8–14**.

Owner data is entered only once in the Owner table

Owner

Owner ID	First Name	Last Name	Address	Phone	Click to Add
1	Dale	Franklin	228 S. Pine	(555) 235-8634	
(New)					

In the Pet table, the Owner ID, a common field in both Pet and Owner tables, identifies these pets as belonging to Dale Franklin

Pet

Pet ID	Pet Name	Pet Type	Owner ID	Care Requested	Click to Add
100	Maggie	Dog	1	Morning walks	
101	Jake	Cat	1	Morning feeding	
			0		

FIGURE 8–14 Data in related tables

So in the database, you only need to enter Dale Franklin's information once. If he moves or changes his phone number, you modify the data in the Owner table only. Any forms, reports, or queries that use data from the Owner table are updated automatically. If he adopts a new pet, you add that data only to the Pet table without needing to change or reenter any owner data. You could also track how much you charge for each service in a separate table, and then perform calculations on that data. Because the focus is still on manipulating data and not on performing the calculations, a database is a better choice for this task.



1-3.3.6

Entertainment Software

Entertainment software includes applications that let you download and listen to music or the radio, watch movies and television shows, and play games. Some applications, such as Apple iTunes, provide access to more than one type of digital media, including songs, movies, TV shows, and radio stations. Other software such as music players, radio applications, and video players concentrate on a single type of media.

Music and Video Applications

VOCABULARY
playlist

You use music applications such as Windows Media Player and iTunes to build a collection of digital music and arrange it into ***playlists***, which are lists of songs or pieces of music organized in sequence, though you can also shuffle the order. You can play the music files on a computer or transfer them to a handheld device such as a portable media player. Mobile music apps such as Google Play Music and iTunes for iOS are especially popular because they are designed for listening to music on the go. Video player software includes QuickTime, RealPlayer, and the VLC media player; all of these applications also play music. You use the applications to play videos in a variety of file formats, organize videos into playlists, and set preferences such as displaying or hiding subtitles.

Radio applications such as Pandora, Spotify, and iHeartRadio work like online radio stations. You connect to a server providing a radio service, create an account, and then select music to play immediately on your desktop or mobile device. Some applications such as Pandora suggest songs and other music based on your selections and let you create your own stations. For example, you could create one station that plays music from a particular artist and another that plays only a particular genre of music.

Game Software

Game software for personal computers is one of the most popular types of software that people use today. Some game applications are electronic versions of physical games, such as Solitaire or Scrabble, have rules that are familiar or easy to grasp, and can be played for short periods of time. In fact, they are sometimes called casual games because they require little time commitment to learn and play.

Other games are more involved, requiring users to devote time to learn the intricacies of the rules and options and to complete a game, which can often take many hours. These types of games are often referred to as long-play games. Genres of long-play games change frequently as technology changes, but typically include adventure games, in which you solve puzzles and gain information and skills to meet an objective. Role-playing games work in a similar way, except you play the role of a character, such as a knight or wizard, as you journey on an adventure. Another genre of long-play games includes simulators, such as those where you build a city and manage a complex set of urban factors. Strategy games focus on critical thinking to solve problems, often using military tactics. Sports games also fall into the category of long-play games because they can involve sophisticated rules. These games emulate a sport such as football or soccer, including teams and strategy.

Media-Editing Software

IC3 1-3.3.7

If you acquire digital media such as music, video, and image files, you often need to edit it to suit your purposes. For example, suppose you want to make a short video demonstrating how to make sushi. You could use a digital video camera to record yourself making the sushi, select a music file to play at the beginning of the video, and take photos of the finished product to display at end of the video. To fine-tune each component, you use graphics software to correct any flaws in the photos, music-editing software to play only a short segment of a song, and video-editing software to edit the video recording and produce it with the photos and music.

Graphics Software

You use graphics software such as Microsoft Paint, Adobe Photoshop, and CorelDRAW to create, edit, and print graphics, including pictures, drawings, photographs, icons, and other images. The three major types of graphics software are paint, photo-editing, and drawing software. Paint software such as Microsoft Paint provides tools for painting the screen, which involves manipulating pixels by filling them with color. If you need to create a graphic on a Web page, for example, or any other object displayed on a computer screen, you can use paint software.

TECHNOLOGY CAREERS

Video Game Industry

If you like to play video games, you have probably already considered a career in the video game industry, which continues to grow and lead to other types of technology fields in its application of cutting-edge research and software design techniques. A highly desirable job in the video game industry is that of game designer, the person who conceives of a game concept and then manages a development team to create the game according to the designer's vision. You generally need to work up to the position of game designer by performing well in other industry jobs. These jobs include video game programmer, who writes the code that makes games run; animator, who designs and creates the animated graphics that make video games so engaging; and writer, who writes the story of the game, scripts to manage the action, and dialog for the characters. Besides technical and creative skills, you also need to work well in teams, stay informed about changes in a fast-moving field, and motivate yourself to learn about the software tools other video game professionals use to develop games and other entertainment software.

Basic photo-editing software includes features for improving digital photos by adjusting brightness and contrast and cropping out parts of the photo. Photo Gallery, shown in **Figure 8–15**, is a basic photo editor you can download from the Microsoft Web site. Digital cameras also usually provide photo-editing software you can install on your computer.

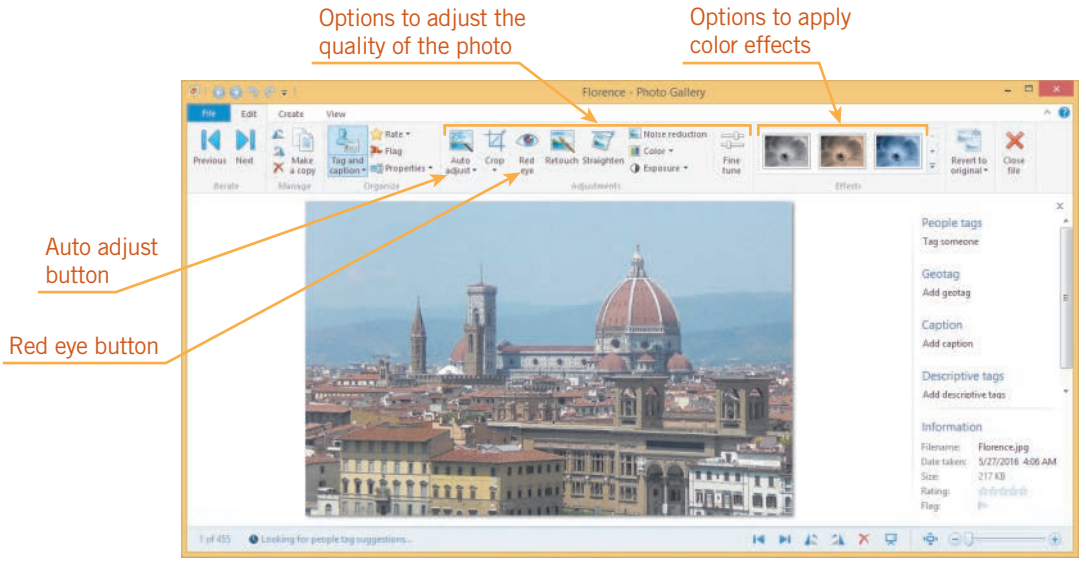


Photo courtesy of Lisa Ruffolo

FIGURE 8–15 Photo Gallery photo editor

The easiest way to edit a photo in Photo Gallery is to display the photo and then click the Auto adjust button on the Edit tab. The Auto adjust tool selects the best settings for the photo, including brightness, contrast, and color. If the photo includes one or more people with red eye, where they appear to have red eyes due to an effect caused by flash photography, you can click the Red eye button to remove this flaw. You can also select an option in the Effects group to apply color effects, such as brown tones that make a photo look antique.

More sophisticated photo-editing applications such as Adobe Photoshop apply advanced effects to photos, give you precise control over color, and let you crop irregularly shaped objects, such as those with curves and waves.

Unlike paint software, drawing software approaches a graphic as a set of geometric objects, including lines and closed shapes. Because of this approach, graphics created with drawing software can be resized without reducing the quality of the image, which is not the case with paint software. 3-D graphics software also uses mathematics to represent 3-D objects and allows users to rotate and view them from many angles. A special type of 3-D graphics software is ***computer-aided design (CAD) software***, which professional designers use to create models of products, buildings, and other objects; engineering and technical drawings; and blueprints for architectural projects.

VOCABULARY
computer-aided design (CAD) software

Music-Editing Software

Music-editing applications such as Apple Garage Band, Music Maker Jam, and Finale are designed for people who want to record and edit their own music. You can use these applications to compose and record songs; change the volume, speed, and sound quality of recordings; add sound effects; and mix voices and instruments.

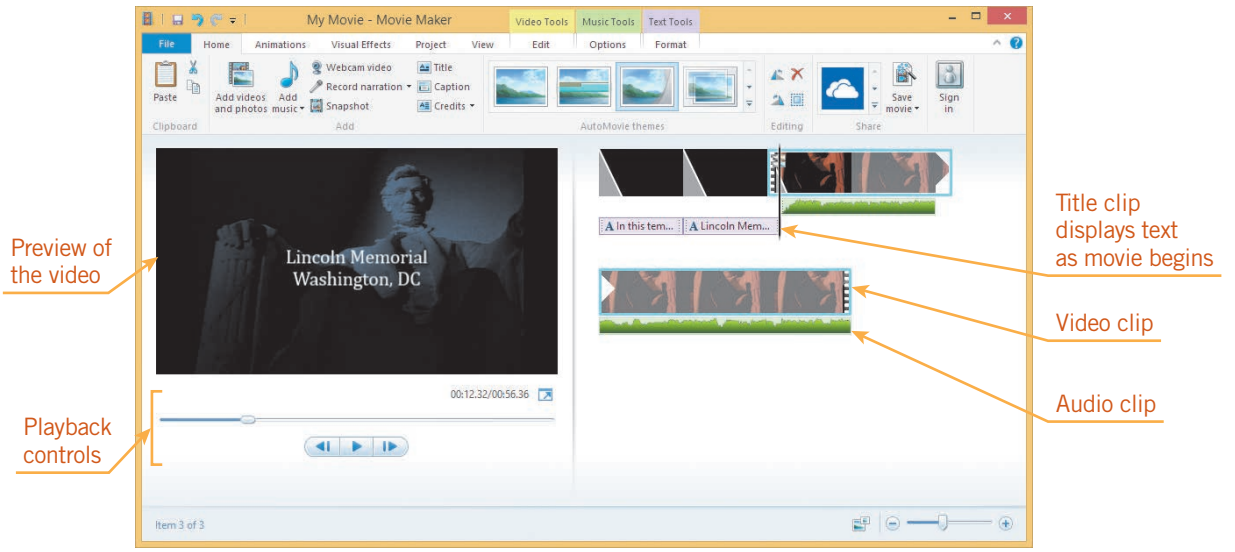
Some music-editing applications, including Music Maker Jam, provide parts of songs, called loops, from various genres. To compose a song, you would complete the following steps:

1. Select a loop from a genre such as Rock or Jazz.
2. Add instruments, other loops, and sound effects to create a more complete sound.
3. Adjust the volume levels of individual instruments to emphasize the guitar or the vocals, for example.
4. Save the composition to play on your computer.

Video-Editing Software

When you use video-editing software such as Windows Movie Maker, Apple iMovie, or Camtasia Studio, you work with video segments called ***clips***. You arrange the clips in sequence on a timeline or storyboard, add transitions between clips, insert titles, and zoom in and out to direct the viewer's attention. **Figure 8–16** shows a video being created in Windows Movie Maker, which is a basic video editor you can download from the Microsoft Web site.

VOCABULARY
clip



Courtesy of the National Park Service

FIGURE 8–16 Windows Movie Maker

Creating a movie with Windows Movie Maker involves completing three major steps:

1. Import video clips, music clips, and pictures.
2. Edit the movie to arrange the clips. You can also add transitions, effects, and titles, and coordinate music or other audio.
3. Publish the edited movie or slide show, which you can view in a video player. The published movie includes all the digital media in one video file.

1-3.4.1
1-3.4.2
1-3.4.3
1-3.4.4

Using Software Tools

Utility programs are tools you use to maintain your data files, software, and hardware. ***File utilities*** include software that helps you manage files, convert files from one format to another, and thoroughly delete files. ***Disk management utilities*** include software that helps the operating system store files efficiently on a disk and removes unnecessary files. ***Software utilities*** include software updating tools, virus and other malware scanners, and system monitors.

1-3.4.1

File Compression Software

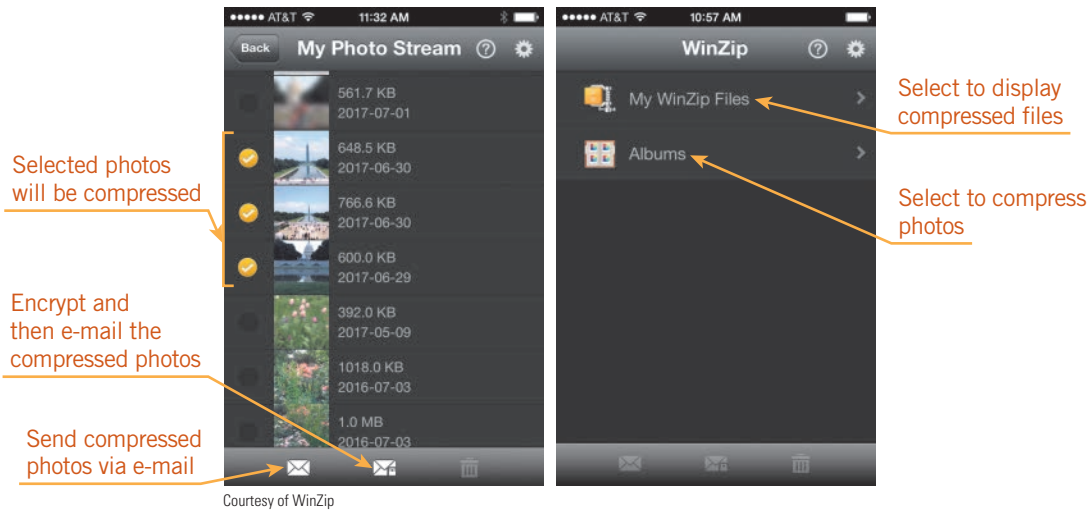
File compression software is a type of file utility that reduces the size of a file by removing redundant data. You compress files before attaching them to an e-mail message, for example, so they can be transferred more quickly. When you receive a compressed file, you use the file compression software again to expand the file to its original size. Although operating systems provide file compression software, you can install separate utilities that perform the same tasks and include additional features such as encrypting the compressed files for extra security. **Figure 8–17** shows WinZip, a popular file compression utility, for iOS.

VOCABULARY

file utility

disk management utility

software utility



Courtesy of WinZip

FIGURE 8–17 WinZip for iOS

You can use WinZip for iOS to compress photos before attaching them to an e-mail or text message. To do so, you would complete the following steps:

1. Select the photos as shown in the image on the left in Figure 8–17.
2. Tap the Message icon on the left or the Encrypted Message icon to its right. WinZip compresses the files and then displays the apps you can use to send the compressed file.
3. To display the compressed files, tap My WinZip Files, as shown on the right in Figure 8–17.

File compression software determines which redundant data to remove according to sophisticated ***algorithms***, which are sets of rules a program follows in calculations or other problem-solving steps. The algorithm for compressing a text file identifies patterns in the text, including certain characters or words that often appear together, such as "th" or "is the." The file compression software keeps track of this pattern in a log, and substitutes the text for a code. For example, instead of storing the words "is the" 25 times in a file, the software uses "1" as the code for "is the," which stores only one character instead of six. When the file is extracted, the software reverses the operation and substitutes "is the" for each code of "1." This type of compression is called ***lossless compression*** because it reconstructs the original file without losing any data. Lossless file compression methods can reduce text files by 50 percent or more.

Files containing graphics or music do not include much redundant data, so file compression software does not use this kind of algorithm for compressing media files. Instead, it uses a ***lossy compression*** method, which removes data identified as unnecessary in the file. For example, suppose you want to compress a graphic with a white background. Although the background seems to be the same shade of white at normal size, when you use graphics-editing software to zoom into the background, you'll see that each pixel is a slightly different shade of white. Instead of retaining thousands of shades of white, file compression software changes the color value of some pixels so the background is composed of only hundreds or dozens of shades, reducing the size of the file significantly. However, when you extract the graphic, the lost colors are not restored, meaning the graphic is not exactly the same as the original file because some data has been lost. You are unlikely to notice the difference in a graphics file, which is why these programs use lossy compression methods for graphics.

VOCABULARY

algorithm

lossless compression

lossy compression

disk cleaner

disk scanner

defragmenter

Disk Management Software



1-3.4.3

You use disk management software to maintain your hard disk by keeping it free of problems that could prevent you from accessing your data. The failure of a hard disk can be an inconvenience if you have backups of your data, and a disaster if you don't. Disk management software helps you prevent disk failure from occurring in the first place by removing corrupted files and unnecessary files, blocking access to damaged parts of the disk, and arranging data for efficient retrieval.

You should use three disk management utilities regularly. One is a ***disk cleaner***, which identifies files you can safely delete to free up disk space. Another is a ***disk scanner***, or error-checking tool, which scans for disk errors, such as parts of corrupted files and damaged sections on the disk, and then repairs them. The third tool is a ***defragmenter***, which can optimize the way files are stored on the disk. Desktop operating systems provide these utilities by default; you can download and install apps that perform these tasks on mobile operating systems.

In addition to cleaning, scanning, and defragmenting a disk, you can compress it, which is similar to compressing files. A disk compression utility increases the amount of data you can store on a hard disk by compressing all of its files. Instead of selecting files to compress, as you do with a file compression utility, a disk compression utility works in the background whenever you store files on the hard disk.

In Windows 8, the disk cleaner utility is called Disk Cleanup, which you use in Step-by-Step 8.2. When you start Disk Cleanup, it searches your hard disk for unnecessary files, such as temporary Internet files and those in your Recycle Bin, and then lists the types of files. You can select each type of file to learn its purpose and determine whether you want to permanently delete those files from your hard disk.

QUICK TIP

Recall from Lesson 2 that you maintain system and application software through software updates, preferably those that are set to update automatically.

Step-by-Step 8.2

1. Click the **File Explorer** button on the taskbar to open the File Explorer window.
2. Right-click the icon for your hard disk, such as Local Disk (C:), and then click **Properties** on the shortcut menu to open the Properties dialog box for your hard disk. See **Figure 8–18**. The General tab in this dialog box shows how much space files are using on the hard disk and how much free space is available. If the disk were getting full, you could select the check box labeled Compress this drive to save disk space to compress the disk.

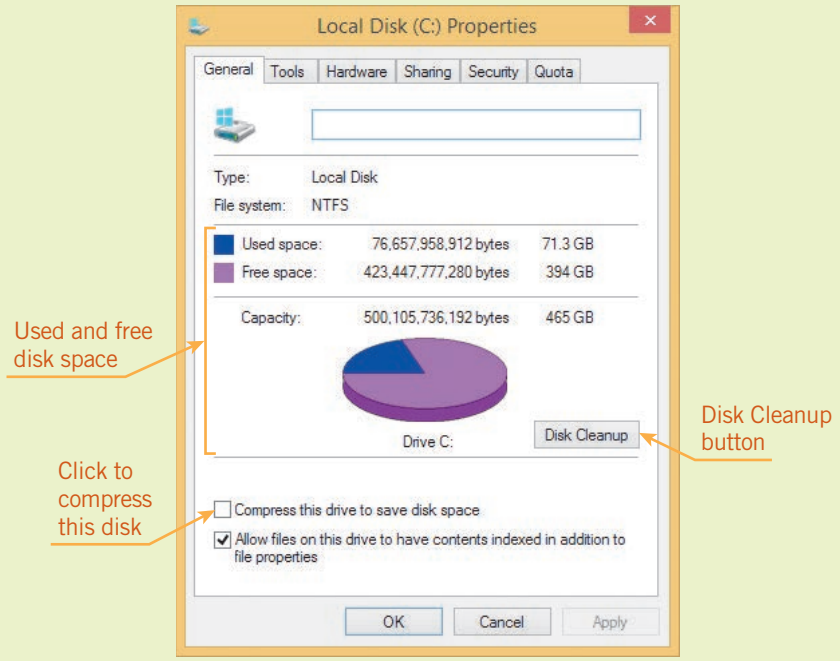


FIGURE 8–18
Local Disk (C:) Properties dialog box

3. Click the **Disk Cleanup** button. Disk Cleanup calculates how much space you can free and then opens the Disk Cleanup for (C:) dialog box. See **Figure 8–19**. The dialog box on your computer might have a different name and display different information. Temporary Internet files are safe to delete.

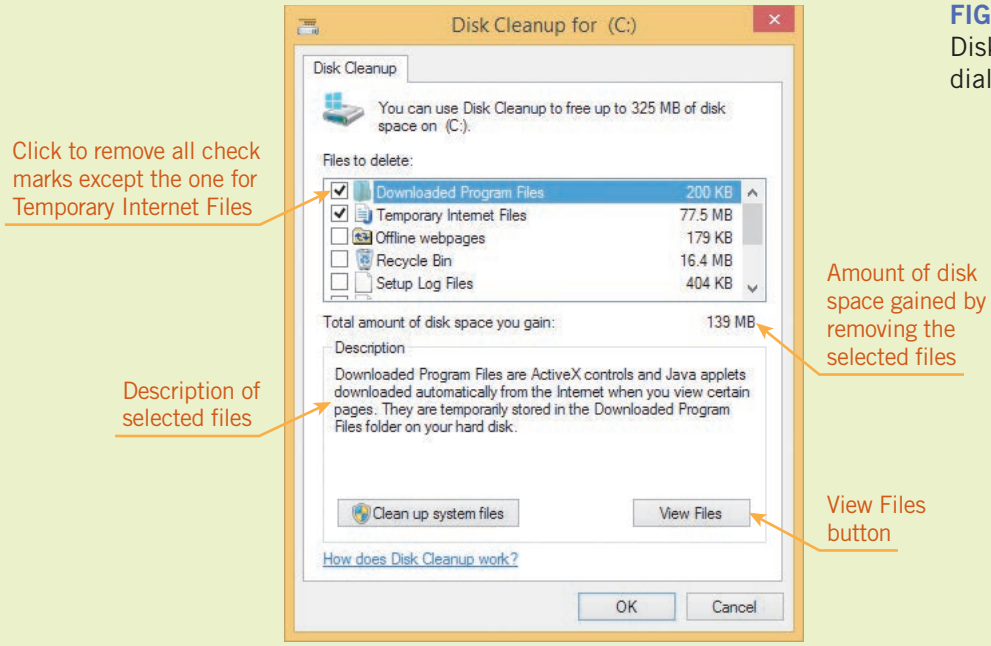


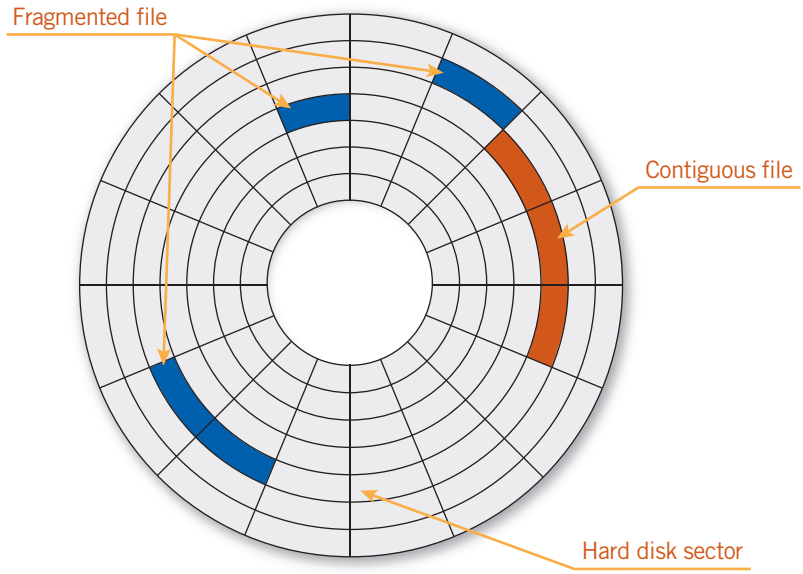
FIGURE 8–19
Disk Cleanup for (C:) dialog box

4. In the Files to delete box, click the check boxes as needed to ensure that the only check box selected is for Temporary Internet Files.
5. Click **Temporary Internet Files** in the Files to delete list to display a description of these files in the Description area of the Disk Cleanup for (C:) dialog box. (Click the Temporary Internet Files name, not the check box.)
6. Click the **OK** button. A dialog box opens asking if you're sure you want to permanently delete these files.
7. Click the **Delete Files** button. It might take a few minutes to clean the files from your hard disk.

To understand how an error-checking tool and a defragmenter work, recall that the surface of a hard disk contains concentric circles called tracks. Tracks are divided into blocks of 512 bytes, and each block is called a ***sector*** of the disk. To save a file on a disk, the operating system assigns the file to one or more sectors. Each part of a file stored in a sector is called a ***cluster*** of data. Because most files are larger than 512 bytes (the size of one sector), the data in a file is usually divided among several clusters. A file system error known as a ***lost cluster*** occurs if the operating system loses track of which clusters contain the data that belong to a particular file. An error-checking tool identifies file system errors and can repair them if necessary. In addition, it can scan for and repair physical errors on the hard disk itself, including ***bad sectors***, which are areas of the disk that do not record data reliably.

VOCABULARY
sector
cluster
lost cluster
bad sector

After correcting any errors on your hard disk, you can run a defragmenter to improve the disk's performance so that applications start and files open more quickly. (Most operating systems run a defragmenter according to a schedule, so you can also wait and let the operating system start the defragmenter for you.) When an operating system breaks a file into clusters, it attempts to place the data in adjoining sectors, and usually does so successfully on a relatively new hard disk. When you delete a file, the operating system frees the sectors that contained the file's data. The next time you save a file, the operating system searches for the first available sector, stores a cluster of data, and then searches for the next available sector, which might not be next to the first one. The more files you save and delete, the more scattered the clusters for a file become. A disk that contains files whose clusters are not contiguous, or next to each other, is said to be fragmented. See **Figure 8–20**.



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FIGURE 8–20 Fragmented disk

The more fragmented the disk, the longer the operating system takes to retrieve the file, and the more likely you are to have problems with the file. When an application tries to access a file on a fragmented disk, file retrieval takes longer than necessary because the application must locate clusters that aren't adjacent. Defragmenting rearranges the clusters on the disk so each file's clusters are adjacent to one another. When a disk is in this state, it is said to be optimized.

In Step-by-Step 8.3, you use the Windows 8 disk scanner utility, called the Error-checking tool, to scan your disk for errors. You also learn how to start the Optimize Drives tool, the defragmenter in Windows 8, and examine its schedule. By default, Optimize Drives is set to check your hard disk once a week and then defragment it if it's fragmented. Because defragmenting a hard disk can take a long time and you must close all applications, including those in the background, before defragmenting, you won't defragment in the following steps. To perform the following steps, you must be using an Administrator account. If you are not using an Administrator account, read but do not perform the steps.

Step-by-Step 8.3

1. In the Properties dialog box for your hard disk, click the **Tools** tab. You use this tab to start the Error-checking tool and the Optimize Drives tool.
2. Click the **Check** button to open the Error Checking dialog box for your hard disk. In **Figure 8–21**, this is the Error Checking (Local Disk (C:)) dialog box. Your dialog box might have a different name. If the Error-checking tool is set to run on a schedule, which it is by default, you don't need to check for errors, though you can if you want to check anyway.

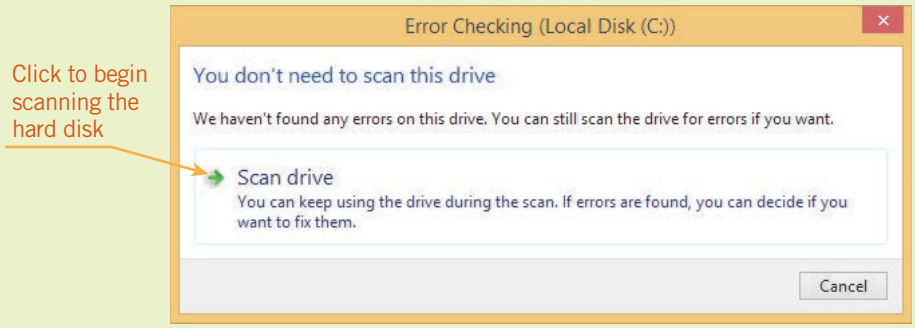


FIGURE 8–21
Error Checking (Local Disk (C:)) dialog box

3. Click **Scan drive** to scan the hard disk for errors, which might take a few minutes.
4. When the tool is finished scanning, click the **Close** button. If the tool had found file system errors, it would fix them automatically or advise you how to proceed.
5. On the Tools tab of the Properties dialog box for your hard disk, click the **Optimize** button. The Optimize Drives dialog box opens. See **Figure 8–22**.

QUICK TIP

If a dialog box opens after you click the Optimize button and displays a message that Optimize Drives was scheduled using a different program, click the Cancel button, and then read but do not perform Steps 6–7.

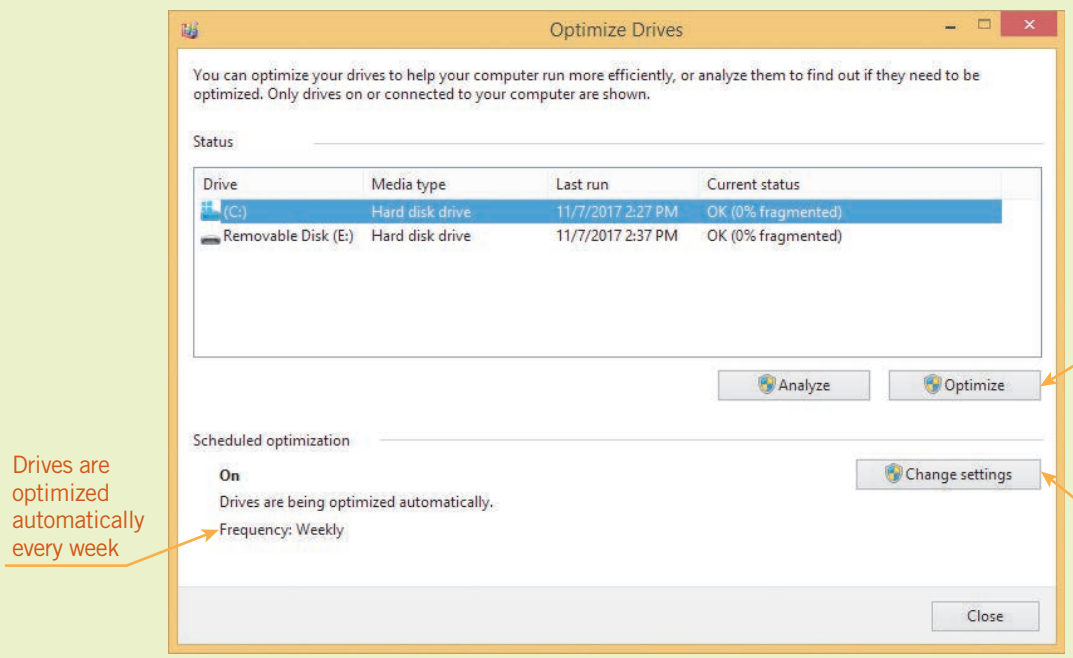


FIGURE 8–22
Optimize Drives dialog box

6. Click the **Change settings** button to examine the defragmenting schedule. Another Optimize Drives dialog box opens showing the optimization schedule, which is set to once a week by default.
7. Click the **Cancel** button to close the Optimize Drives dialog box showing the schedule, and then click the **Close** button to close the first Optimize Drives dialog box.
8. Close the Local Disk (C:) Properties dialog box, and then close the File Explorer window.



1-3.4.4

Malware and Antivirus Software

VOCABULARY
malware
virus
worm
Trojan
bot
spyware

When you connect to the Internet, receive an e-mail message, or share your computer or files with others, your computer is vulnerable to harm from people who might attempt to access confidential information or damage your files. They can do so through ***malware***, which is short for malicious software. Malware includes computer viruses, worms, Trojans, bots, and spyware. By copying itself and triggering computer code, a ***virus*** can infect your computer and damage your files and system settings. Viruses are often transmitted through e-mail attachments or downloaded files, but they don't spread until you open the infected attachment or file.

In contrast, a ***worm*** is harmful computer code that spreads without your interaction. A worm slips from one network connection to another, replicating itself on computers. As it does, a worm consumes network resources, overwhelming computers until they become slow or unresponsive.

Another type of malware is a ***Trojan***, also called a Trojan horse, which is malware that hides inside another program, such as a browser toolbar you download from the Web. When you install the toolbar, the Trojan infects the operating system, allowing a hacker to access your computer. If attackers access your system through a Trojan, they might install a ***bot***, short for robot, which is a program that runs repetitive tasks. Bots can control your computer without your knowledge to perform illegal activities such as sending massive amounts of spam (electronic junk mail).

Spyware can also install itself or run on your computer without your consent or control. As its name suggests, spyware monitors your computing actions, usually while you are online, to collect information about you. Sometimes, spyware passes information about your Web browsing habits to advertisers, who use it to improve their products or Web sites. Other times, a special type of spyware called adware changes your browser settings to open pop-up ads, which are windows that appear while you are viewing a Web page and advertise a product or service. Pop-up ads interrupt your online activities and can be difficult to close; they can also be vehicles for additional spyware or other types of malware.

Common symptoms of malware are when your computer runs much slower than normal, messages appear unexpectedly, programs start or close on their own, or the operating system shuts down suddenly.

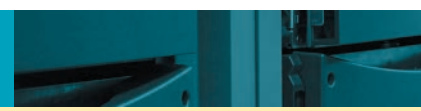
To defend against malware, you should install and run antivirus software on your computer, and then keep it up to date because new malware is released frequently. Antivirus software blocks potential malware, scans your computer, and safely removes viruses, worms, Trojans, and bots. Some antivirus software also scans for spyware. **Table 8–1** lists some popular antivirus software for Windows, Mac OS X, iOS, and Android. Mobile operating systems are well protected against malware because they exclusively use online stores to distribute apps, and developers can tightly control the software offered at online stores.

TABLE 8–1 Antivirus software

OPERATING SYSTEM	SOFTWARE	DETAILS
Windows	Norton Antivirus	Also available for Mac OS X and mobile operating systems
	McAfee Antivirus	Also available for Mac OS X and mobile operating systems
	Windows Defender	Runs automatically if no other antivirus software is installed
Mac OS X	Sophos Anti-Virus for Mac	Freeware; also scans for Windows malware you might send via e-mail
	Avast! Free Antivirus for Mac	Freeware; scans only for Mac malware
	XProtect	Included with Mac OS X; scans downloaded files for malware
iOS	VirusBarrier	Scans files on a Mac or PC before transferring them to an iPhone or iPad
Android	Lookout Security	Comes preinstalled on Samsung devices
	Kaspersky Mobile Security	Also available for all other operating systems except iOS

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SUMMARY



In this lesson, you learned:

- You use productivity applications to perform work and other activities effectively. Productivity applications are often bundled together in a software suite.
- You use word-processing software to produce written documents such as reports, letters, memos, research papers, and flyers. Features in word-processing software help you reduce the number of errors in a document and improve the quality of your writing. They also provide formatting features so you can make documents look professional and appealing and include collaboration features for working with other users.
- Desktop publishing software is similar to word-processing software because you use it to arrange text and graphics on a page. In addition, it includes tools for producing and printing typographic-quality documents and for sending files to a commercial printer.
- You use presentation software to organize and present text, graphics, and other media as a slide show. Layouts in presentation software guide you to arrange text and graphics on a slide. Presentation software also includes features to engage the audience and clarify ideas during a slide show, such as slide transitions and animations.
- You use spreadsheet software to organize numeric data so that you can calculate, analyze, interpret, and present it. You insert a formula to display the results of a calculation. If you use cell references in a formula, recalculation is automatic when data changes. The ability to update automatically makes spreadsheets especially useful when you need to perform what-if analysis.
- To help you visualize numeric data, spreadsheet software includes tools for creating charts (also called graphs). Charts show trends or relationships in data that you might not notice when examining columns or rows of numbers.
- You use database software to enter, organize, update, retrieve, and produce reports on the electronic data in a database. All of the data in a database is stored in one or more tables, which are composed of rows and columns, similar to spreadsheets. Each column in the table represents a field and each row represents a record.
- A database file can contain objects including tables, forms, queries, and reports. You use a form to enter data into a table. You use a query to request specific information that meets set criteria from the database. A report provides data as a formatted printout or display.

- Both spreadsheets and databases are designed for organizing, managing, and tracking data that is stored in columns and rows. If your focus is on using numerical data to make calculations or a quick analysis, create a spreadsheet. If your focus is on storing other types of data for the long term and manipulating it efficiently, create a database.
- Entertainment software includes applications that let you download and listen to music or the radio, watch movies and television shows, and play games.
- You use media-editing software to edit digital media such as photos and other pictures, music, and videos.
- You use graphics software to create, edit, and print graphics, including pictures, drawings, photographs, clip art, icons, and other images. The three major types of graphics software are paint, photo-editing, and drawing software.
- Music-editing applications are designed for people who want to record and edit their own music. Video-editing applications are designed for people who want to create and edit videos. You import and then organize video clips, music clips, and other media clips, and then publish them together in one video file.
- Utility programs are tools you use to maintain your data files, software, and hardware. File utilities include software that helps you manage files, convert files from one format to another, and thoroughly delete files. Disk management utilities include software that helps the operating system store files efficiently on a disk and removes unnecessary files.
- To defend against malware, you should install and run antivirus software on your computer, and then keep it up to date because new malware is released frequently. Antivirus software blocks potential malware, scans your computer, and safely removes viruses, worms, Trojans, and bots. Some antivirus software also scans for spyware.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. In a spreadsheet, a cell reference is the column letter and row number of the cell, such as A1.

T F 2. Desktop publishing software is another name for word-processing software.

T F 3. Database software that works with related tables is called relational database software.

T F 4. Music-composition software is one type of software that has not been developed yet.

T F 5. A defragmenter removes malware from your hard disk.

MULTIPLE CHOICE

Select the best response for the following statements.

1. _____ software is a type of utility that reduces the size of a file by removing redundant data.
   A. File optimizing
   B. Lossy
   C. Disk cleaner
   D. File compression
2. Presentation software provides _____, which are pre-set arrangements for slide content, including text and graphics.
   A. transitions
   B. frames
   C. layouts
   D. clips
3. The main purpose of spreadsheet software is to perform _____.
   A. updates
   B. data-retrieval tasks
   C. calculations
   D. file management tasks
4. When you use video-editing software, you work with video segments called _____.
   A. clips
   B. bots
   C. blogs
   D. clusters
5. A file system error known as a(n) _____ occurs if the operating system loses track of which clusters contain the data that belongs to a particular file.
   A. lost cluster
   B. bad sector
   C. worm
   D. algorithm

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is productivity software?

2. How is desktop publishing software similar to word-processing software? How is it different?

3. What is the purpose of presentation software?

4. What is what-if analysis?

5. What are three examples of databases?

6. When should you consider creating a database instead of a spreadsheet?

7. What is the purpose of software such as Apple Garage Band and Music Maker Jam?

8. How does a casual game differ from a long-play game?

9. What approach does drawing software take toward graphics? What is the advantage of this approach?

10. What are common symptoms of malware?

PROJECTS

PROJECT 8–1

In this project, you open a presentation in Microsoft PowerPoint, review the slides, and then answer questions directly in the presentation. Submit the completed presentation as your instructor requests.

1. Start PowerPoint 2013, and then open the **Creativity** presentation provided with your data files for Module 1, Lesson 8.
2. Click the **FILE** tab, click **Save As**, and then click **Computer**. Click the **Browse** button, navigate to the location where you save your solution files, type **Creativity Tips** as the filename, and then click the **Save** button.
3. Review all the slides in the presentation.
4. Display **Slide 2**, click the content placeholder on the right, and then enter your responses to the following questions. Press the **Enter** key to start a new bulleted item.
   a. Where do the colors, fonts, and colored bars on each slide come from?
   b. What determines the arrangement of the slide title and the two bulleted lists on this slide (Slide 2)?
   c. On Slide 3, what is the purpose of the first placeholder? What is the purpose of the second placeholder?
   d. How could you use a placeholder on Slide 3 to add a picture to the slide?
5. Click the **Start From Beginning** button on the Quick Access Toolbar, and then press the spacebar as necessary to play the slide show to the end.
6. After you end the slide show, return to **Slide 2**. Click at the end of the bulleted list with your responses, press the **Enter** key, and then answer the following question: What happens before each slide is fully displayed?
7. Click the **Save** button on the Quick Access Toolbar to save the presentation, and then close PowerPoint.

PROJECT 8–2



1-3.3.7

In this project, you explore the applications on your computer for editing media files, and then answer questions. Some steps require you to perform new tasks or solve problems independently. Submit the written answers as your instructor requests.

1. Start File Explorer, and then navigate to the location where you store your data files for Module 1, Lesson 8.
2. Right-click the **Media1** file, and then point to *Open with* on the shortcut menu. Which applications can you use to open this file?
3. Open the **Media1** file in each application listed on the Open with submenu. Explore the tools of each application, and then identify which applications you would use to perform the following tasks:
   a. Add text to the file contents.
   b. View the file contents.
   c. Rotate the file contents.
   d. Display the file contents on the lock screen.
4. Right-click the **Media2** file, and then point to *Open with* on the shortcut menu. Which applications can you use to open this file?
5. Open the **Media2** file in each application listed on the Open with submenu. Explore the tools of each application, and then identify which applications you would use to perform the following tasks:
   a. Quickly play the file contents.
   b. Set the playback volume.
6. Right-click the **Media3** file, and then point to *Open with* on the shortcut menu. Which applications can you use to open this file?
7. Open the **Media3** file in each application listed on the Open with submenu. Explore the tools of each application, and then identify which applications you would use to perform the following tasks:
   a. Play the file through to the end, and then repeat from the beginning.
   b. Pause the playback.
8. Close all open applications and windows.

PROJECT 8–3

1-3.4.4

Windows includes a virus scanner called Windows Defender. In this project, you start Windows Defender and explore its options. As you explore the options, you take screenshots of Windows Defender. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. Display the Charms bar, click the **Search** charm, begin to type **windows defender**, and then click **Windows Defender** in the search results.
2. Click the **Home** tab, if necessary, and then press the **Alt+Print Screen** keys to capture an image of the Home tab in the Windows Defender window. Save the image as a Paint file named **Windows Defender**.
3. Click the **Update** tab, read the Did you know? note at the bottom of the window, and then click the **Update** button to update your virus definitions.
4. Press the **Alt+Print Screen** keys to capture an image of the Update tab in the Windows Defender window. Save the image as a Paint file named **Update tab**.
5. Click the **Settings** tab, and then click the **Help** link. Read the topic to learn more about Windows Defender.
6. Arrange the Windows Help and Support window and the Windows Defender window so most of both windows are displayed on the screen. Press the **Print Screen** key to capture an image of the desktop. Save the image as a Paint file named **Defender Help**.
7. Close all open windows.

TEAMWORK PROJECT

You work for a Web site design company that often works on projects in teams. Your manager is interested in the collaboration features in Microsoft Office applications. Work with a partner to complete the following steps.

1. Assign Word and Excel to one partner, and assign PowerPoint and Access to another partner.
2. Use the Office Help feature in each application to research the collaboration features that allow more than one person to work on a document, workbook, presentation, or database.
3. Visit the Office.com Web site to learn more about the collaboration features in the Office applications you are researching.
4. Create a list of four features in your applications that help people collaborate when using Office.
5. Combine the list with your partner, and then submit it as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 8–1

FileMaker Pro, available for both Macintosh and PC, is a database program somewhat similar to Microsoft Access, but does not contain as many advanced features. Instead, it is ideal for small businesses and home users. Complete the following.

1. Visit at least two Web sites to research the features and benefits of FileMaker Pro.
2. Provide a short overview of FileMaker Pro, and then list its pros and cons. Also summarize its reporting and charting features.
3. Submit your findings as your instructor requests.

CRITICAL THINKING 8–2

Mac computers have not been as vulnerable to malware as Windows computers. Apple claims that iPhones and iPads are not vulnerable at all. Learn more about these issues by researching online. Complete the following.

1. Visit at least two Web sites to find information about antivirus software for Macs, iPhones, and iPads. Answer the following questions:
   - In short, why does Apple feel it does not need antivirus software for iOS?
   - Are there any known viruses that affect iOS devices?
   - When does Apple recommend running antivirus software with Mac OS X?
   - Why do experts say that you do not need antivirus software for Mac OS X?
2. Suppose you own an iPhone and an iPad. Based on your research, would you install and use antivirus software on the devices? Why or why not?
3. Submit your responses as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 8–1



1-3.3.7

Graphics software is a popular type of Web application. Research graphics software you can use online with your browser, and then answer the following questions. Submit the written answers as your instructor requests.

1. What is SumoPaint? What other graphics software is similar to SumoPaint?
2. What is the PhotoShop Express Editor? How do you access and start PhotoShop Express Editor?
3. What can you do with Gliffy? What software is it often compared to?
4. Are any CAD applications available as Web applications? If so, which ones?

ONLINE DISCOVERY 8–2

Microsoft Office is currently the most popular productivity software suite. Research the history of Microsoft Office, and then answer the following questions. Submit the written answers as your instructor requests.

1. When was Office Version 1.0 for Windows released? Which applications did it include?
2. What was the first graphical version of Microsoft Word called?
3. An application called Microsoft Binder was once included with Microsoft Office. What was the purpose of Microsoft Binder and why was it discontinued?
4. What was significant about Microsoft Office 2007?
5. What is the name of the online, cloud-based version of Microsoft Office?

JOB SKILLS

This lesson presented overviews of at least three types of applications that involve graphics: desktop publishing software, presentation software, and graphics-editing software. If these applications appealed to you, you might enjoy a career as a graphic designer. Learn more about what graphic designers do, the skills they need, and what the job outlook is for the graphic design field. Complete the following steps.

1. Use online resources to research the position of graphic designer. What types of tasks does a graphic designer perform?
2. What skills do you need for these types of tasks?
3. What is the job outlook for graphic designers for the next five years?
4. Submit your findings to your instructor as requested.

EXPLORE AND SOLVE

Did you know?

- Some graphics file formats compress graphics automatically.
- You can reduce the file size of uncompressed graphics files using the Windows compression tool.

1. Display the Start screen, and then press the **Print Screen** key to capture an image of the Start screen. Save the image as a Paint file named **Lesson 8** in the location where you are storing your solution files for Module 1, Lesson 8. Leave the Lesson 8 file open in Paint. By default, Paint saves the file using the PNG file format.
2. Click the **File** tab, click **Save as**, click the **Save as type** button, and then click **24-bit Bitmap (*.bmp, *.dib)**. Navigate to where you saved the original Lesson 8 file from Step 1, and then click the **Save** button. Now you have two copies of the Lesson 8 file: one in the PNG format and one in the BMP format.
3. Use the same technique to save the Lesson 8 file using the JPEG format.
4. Use the same technique to save the Lesson 8 file using the TIFF format.
5. Start File Explorer, navigate to where you saved the Lesson 8 files, and then display the files in Details view. Which file has the largest file size? Which file has the smallest file size?
6. Right-click the largest Lesson 8 file, point to *Send to* on the shortcut menu, and then click **Compressed (zipped) folder**. What is the file size of the new compressed file?
7. Use the same technique to send the smallest Lesson 8 file to a compressed (zipped) folder. What is the file size of this new compressed file?
8. Based on these steps, which file type automatically compresses graphics on its own, without using a file compression utility? Which file type does not automatically compress graphics?
9. Close all open windows.



Estimated Time:
1.5 hours

LESSON 9

Computer Troubleshooting

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe typical software problems.
- Use troubleshooting tools provided by an operating system.
- Get help from online resources.
- Describe symptoms of problems with hardware components.
- Identify common solutions to problems with peripheral devices.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

knowledge base
online forum
power surge
problem report
quarantine
Safe mode
spyware definition
System Restore
thread
troubleshooting
virus definition

Microsoft product screenshots used with permission from Microsoft Corporation.

In this lesson, you learn how to solve computer problems by following common troubleshooting steps, and then apply those steps to software and hardware problems. You use troubleshooting tools to identify and solve operating system and application software problems, and learn about resources for troubleshooting problems with computer components and peripheral devices.



1-4.1.1
1-4.1.2
1-4.1.3
1-4.1.4
1-4.1.5
1-4.1.6

Approaches to Troubleshooting

Suppose you are using your computer to complete a major project and the deadline is fast approaching. As you work on the project, you're creating content in word-processing, spreadsheet, and graphics applications, and then combining the content into a presentation. As you copy and paste a chart onto the last slide, the presentation application closes suddenly. When you open the application again, a message appears indicating that the presentation you were working on is corrupt and cannot be recovered. Now what do you do?

If you are experiencing a computer problem like this example, you need to troubleshoot to solve the problem. ***Troubleshooting*** means to take a logical, systematic approach to identify the source or cause of the problem, and then apply a solution so that the computer is working normally again. Troubleshooting typically involves the following four steps:

VOCABULARY
troubleshooting

1. *Define the problem*: Describe the trouble that you are having, being as specific as possible. For example, to define the presentation problem, you should note the name and version of the presentation application, the type of content you were trying to paste onto a slide, and the source of that content. Also note the other applications you were running at the time the problem occurred, and any system tasks the computer might have been running in the background.

2. *Identify possible causes*: Consider obvious causes first, such as the original presentation file being damaged. Next, determine the last time you successfully performed the same steps with the software. Have you installed or uninstalled any software since then? If so, those actions are also possible causes.

3. *Determine the most likely cause*: Work through a process of elimination to determine the most likely cause. Test each cause. For example, does the presentation software close unexpectedly each time you try to paste a chart from the spreadsheet software? If not, eliminate pasting a chart as the cause of the problem. If the presentation software does close each time, however, you have found the most likely cause.

4. *Apply solutions*: As you test causes, keep track of possible solutions, and then apply each solution systematically. If pasting a chart from a spreadsheet application caused the problem, does updating one of the applications solve the problem? What about updating both applications? Try your task again to confirm that the solution restores the software to a reliable working state.

When you define the problem in Step 1 of the troubleshooting steps, you determine whether you are trying to solve a software or hardware problem. If the problem seems to involve only applications or the operating system, troubleshoot the software. If the problem occurs as the computer starts, troubleshoot the operating system first. For other computer problems and those where software troubleshooting does not solve the problem, troubleshoot the hardware and peripheral devices.

Getting Help from Online Resources

1-4.1.5

VOCABULARY
knowledge base
online forum
thread

When you have any type of computer problem, you can find valuable troubleshooting information on the Web. The best sources are knowledge bases and online forums. A ***knowledge base*** is a collection of articles, videos, and other sources containing information about a product or topic. Software developers and hardware manufacturers provide knowledge bases to their users to help them solve problems. Typically, a technical support professional writes a knowledge base article to answer common questions or to explain how to work around a known flaw in the software. Knowledge base articles are often part of or linked to software Help topics. They are also available online at the support Web site of a software developer or hardware manufacturer. For example, to access the Microsoft knowledge base, you visit support.microsoft.com/kb. To access the Apple knowledge base, you visit kbase.info.apple.com. On the knowledge base Web site, you search for a topic by keyword the same way you search for any information on the Internet. Operating system knowledge bases include information about third-party software as well as their own software.

An ***online forum*** is a Web site where people conduct conversations by posting messages about a specific topic. Software developers and hardware manufacturers often host online forums where users can post questions or report problems they are having with the product. Other users or technical support people working for the software developer or hardware manufacturer answer the questions or help to troubleshoot the problem. The original message and all the responses to it are grouped together sequentially by topic. This group of related messages is called a ***thread***. Threads are saved in an archive that you can search to determine if your problem has already been solved before you post a new message.

The Apple online forum is called the Apple Support Communities, which you can access from the Apple Web site. In Windows Help and Support, you can click the Microsoft Community website link to display the online forum for Microsoft software. See **Figure 9–1**.

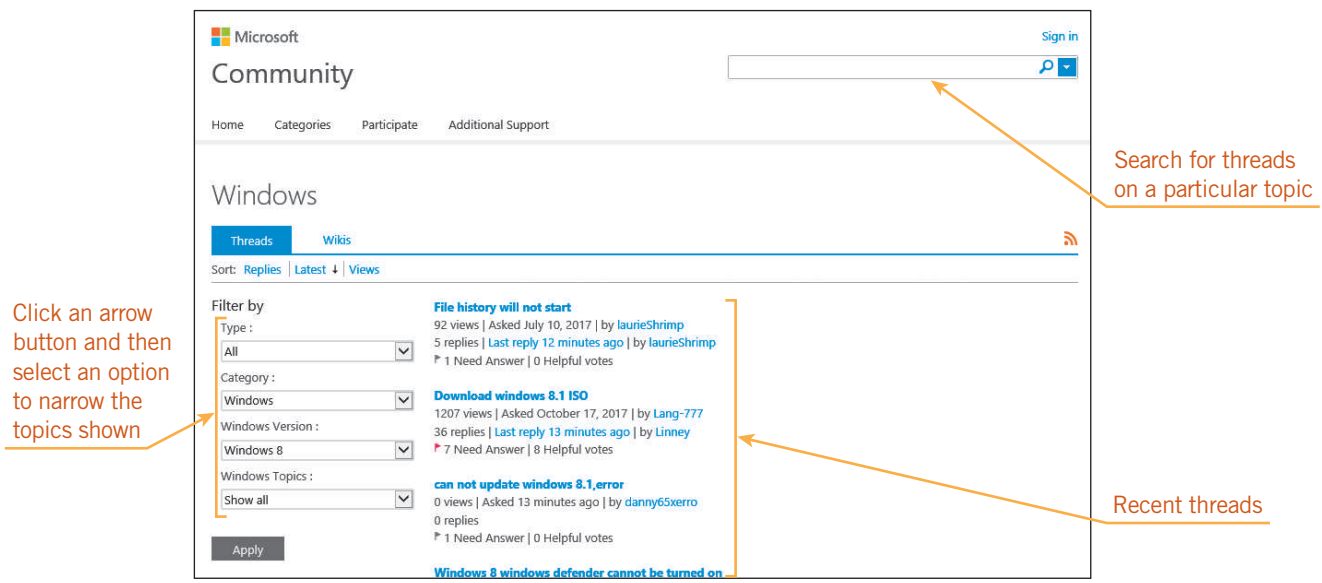


FIGURE 9–1 Microsoft Community online forum

As you work through the four troubleshooting steps to define and solve computer problems, take advantage of online resources so you can learn from the experience of other users and from support professionals.

1-4.1.1
1-4.1.2
1-4.1.3
1-4.1.4
1-4.1.6

Troubleshooting Software

Software trouble ranges from minor difficulties such as a feature that doesn't work as it should to major problems such as the operating system failing to start. **Table 9–1** describes the most common general software problems, their possible causes, and suggested solutions.

TABLE 9–1 Common general software problems

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Operating system does not start or starts and then freezes	Necessary file fails to load; background process starts before operating system starts completely	Restart the computer, and then update the operating system.
Newly installed software does not start	Corrupted or missing software files	Uninstall and then reinstall the software.
Newly installed software starts, but doesn't run correctly	Operating system might not be aware of changes in system settings	Restart the computer, and then restart the software.
Other software does not start or runs with errors	Software bug or conflict with other software	Check the software publisher's Web site for an update or setting change that can solve the problem; otherwise, uninstall one of the programs in conflict.

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The following sections describe other solutions you can try when you are troubleshooting more specific software problems.

1-4.1.1
1-4.1.2
1-4.1.6

Using Troubleshooting Tools

Operating systems include diagnostic tools that help you troubleshoot software problems, including those with the operating system itself. If a Windows application starts, but runs slowly or fails to respond to your commands, you can troubleshoot the problem with Task Manager, which you used in Lesson 2. Mac OS X includes a similar tool called Activity Monitor. You can also troubleshoot Windows software problems using the Action Center, a Control Panel tool that helps you manage security and maintenance settings.

Managing Application Resources

You have already learned to use Task Manager to track the system resources (including CPU and memory) that applications, background processes, and Windows processes consume. You can also use this information to troubleshoot application problems. For example, suppose five applications are open and running on your computer, including Internet Explorer, Microsoft Excel, Microsoft PowerPoint, Microsoft Word, and File Explorer (shown as "Windows Explorer"). As you edit and format text in Word, the changes are very slow to appear in the document. To find the possible cause of this problem, open Task Manager, which might appear as in **Figure 9–2**, which shows the resource usage of the running applications on the Processes tab.

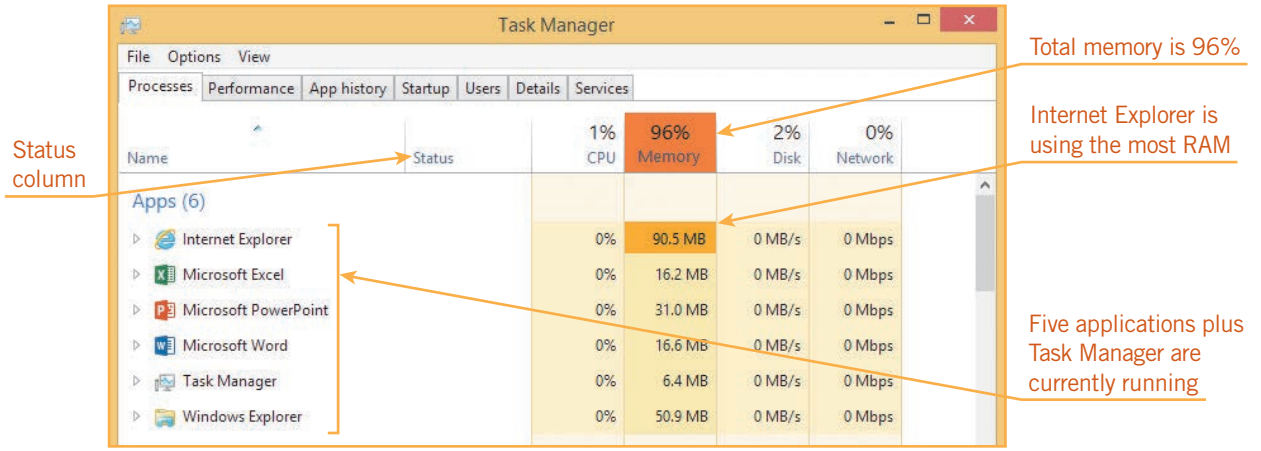


FIGURE 9–2 Task Manager showing six running applications

Total memory is 96%, which is very high, indicating that the open applications are using almost all of the available RAM. To free RAM for Word, close the application using the most RAM, which is Internet Explorer in this case. If Word is still running slowly, close the other applications until Word can access the RAM it needs to work more efficiently.

On a computer running Mac OS X, you use Activity Monitor to manage application resources. Open the Applications folder, open the Utilities folder, and then double-click Activity Monitor to display the Activity Monitor window, which is similar to the Task Manager window. Troubleshoot a slow application the same way: determine how much total memory is being used, and then close applications if the total memory is close to 100 percent.

In Windows, you also use Task Manager to close an application that does not respond to any of your actions, including clicking the Close button (or an equivalent command) to close the application. In such a case, you can open Task Manager and then check the Status column, which might display a status of "Not responding." Select the unresponsive application, and then click the End task button to close the application. Unfortunately, with this method, you lose any work you completed since the last time you saved the open files in the application.

Using Problem-Reporting Tools

Operating systems also keep track of software errors, often in logs, which are text files stored in a system folder. When you have a serious software problem, such as an application closing without warning, Mac OS X, iOS, and Windows display a dialog box asking if you want to send a problem report to Apple or Microsoft. A ***problem report*** is a copy of the error data, which includes details about the problem, such as the name and version of the application, when the error occurred, and technical information about the state of the system at that time. If you agree to send a problem report, the operating system submits the information to help diagnose or solve the problem. These solutions are often provided to you in software updates or patches.

VOCABULARY
problem report

Windows also checks for solutions when an application fails to respond or closes unexpectedly. In those situations, a dialog box might open, similar to the one in **Figure 9–3**, indicating that Windows is checking for a solution to the problem.

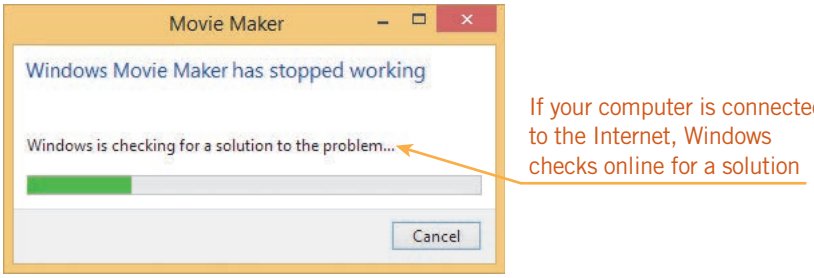


FIGURE 9–3 Message box appears when a Windows application has stopped working

If your computer is connected to the Internet, Windows can search a secure part of the Microsoft Web site for similar problems that other users have reported, and then check for a solution. Solutions that Microsoft checks for include a link to a Help article, a file to download, or steps to perform. When a solution is available, Microsoft sends a message to the Action Center and displays a Solve PC issues ScreenTip when you point to the Action Center icon in the notification area of the taskbar. See **Figure 9–4**.

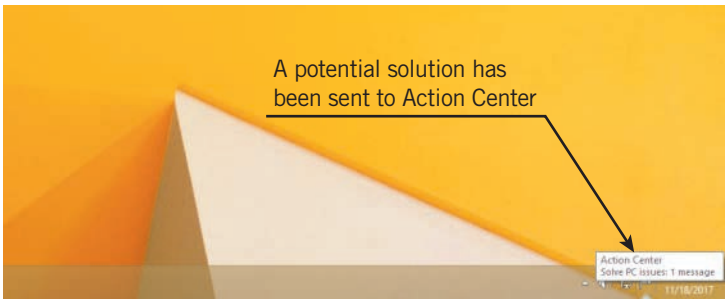


FIGURE 9–4 Action Center ScreenTip

You can click the Action Center icon and then click Open Action Center to open the Action Center window and access the solution Windows found, which you do in Step-by-Step 9.1. In addition to checking for solutions, you can use the Action Center to review messages regarding problem reports, which Windows archives by default, and to determine whether the solution applies to other problems.

Step-by-Step 9.1

1. Display the desktop, if necessary, click the **Action Center** icon in the notification area of the taskbar, and then click **Open Action Center**. The Action Center window opens, displaying messages about computer problems to resolve. See **Figure 9–5**. In this case, the Action Center displays a message about solving a problem with Windows Movie Maker. Your Action Center window might display different messages, or it might not display any messages.

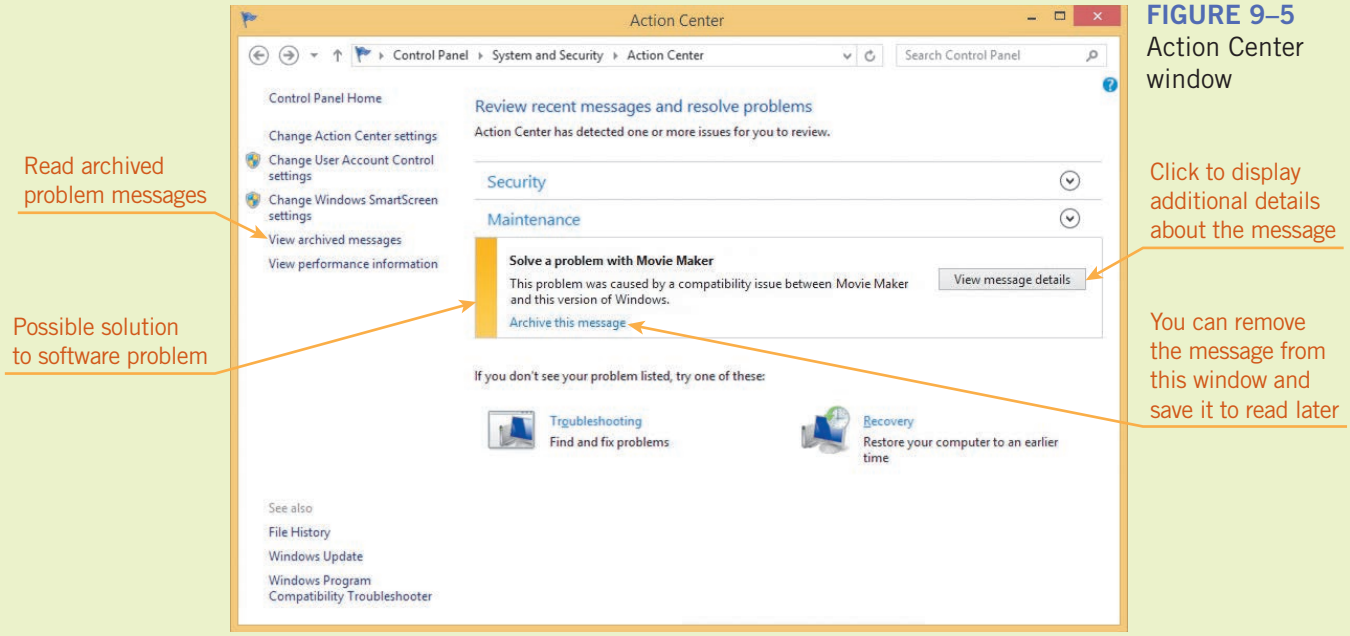


FIGURE 9–5
Action Center window

2. Click the **View message details** button to learn more about a problem listed and solve it, if possible. The Message Details window opens. See **Figure 9–6**.

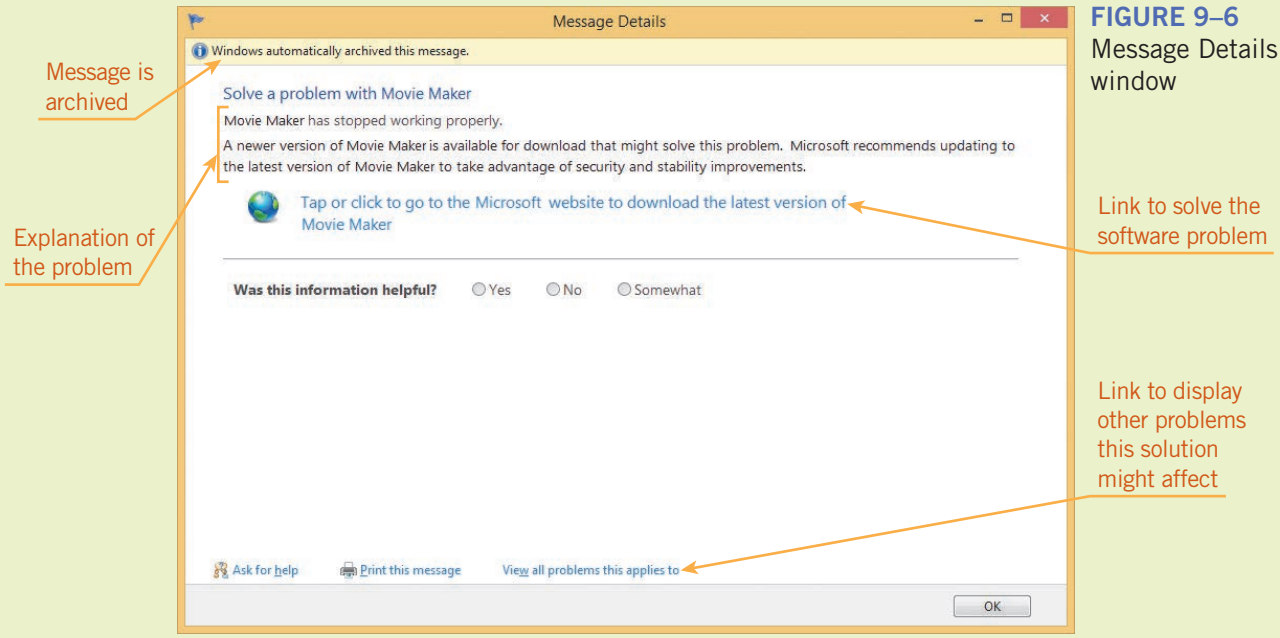


FIGURE 9–6
Message Details window

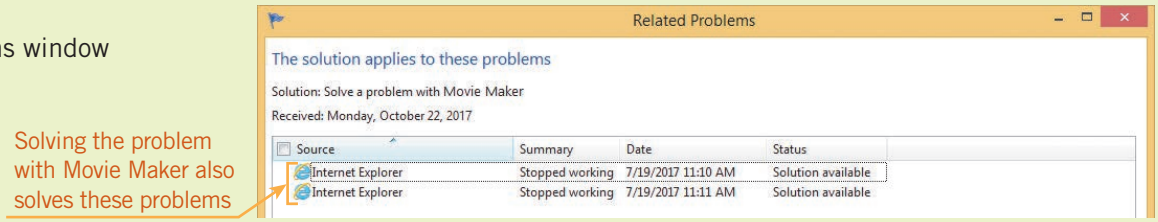
If you had permission to install software, you could click the link for downloading and installing it to update your version of the software.

QUICK TIP

If your Action Center window does not include a View message details button, read but do not perform Steps 2–4.

3. Click the **View all problems this applies to** link near the bottom of the window, if possible. The Related Problems window opens. See **Figure 9–7**.

FIGURE 9–7
Related Problems window



4. Click the **OK** button to close the Related Problems window, and then click the **OK** button to close the Message Details window and return to the Action Center window, which no longer displays the message about a problem with Movie Maker.
5. Leave the Action Center window open for the next Step-by-Step.

Using Automated Troubleshooters

For some software and hardware problems, operating systems offer automated troubleshooters, which are dialog boxes or wizards that check settings and then change them as necessary so you can perform certain tasks. For example, you can use the Connection Doctor on a Mac to have Mac OS X check your Internet and e-mail connection settings and then repair them if necessary. Windows includes similar troubleshooters. These tools are often the best way to solve specific problems such as complications from a software updating tool and program compatibility issues.

To understand how an automated troubleshooter resolves complications from software updates, you need to know how a software updating tool works. It communicates with a server according to a schedule to see if the server has updates for the software. If it does, the updating tool downloads the necessary files, and then refers to a script to install the files in the correct locations on the computer. Sometimes, the update files or the script are lost or damaged before the download or update is completed. A running process or other obstacle might also prevent the updating tool from installing the files in the correct locations. The easiest way to solve these problems is to repeat the update manually. However, if the update is still unsuccessful, you can often run an automated troubleshooter, which checks for problems at each step of the updating process and then repairs them.

Another problem automated troubleshooters can solve involves software compatibility. Software is developed to run under specific versions of an operating system so that it follows the rules of the file system, knows how to request services from the operating system, and can find drivers and other resources it needs to operate correctly. If your computer is running the most recent version of Windows, for example, and you install an application written for an earlier version, such as Windows Vista or Windows XP, the application might run poorly or not run at all. The same is true for software written for Mac OS X. In both operating systems, the older software is considered incompatible with the up-to-date operating system.

Because incompatible applications can actually damage files on a Mac, Mac OS X moves incompatible software to a restricted folder when you upgrade the operating system. It also prevents the application from opening, and advises you to visit the Apple App Store for a more recent compatible version.

ABOVE AND BEYOND

If you are having trouble completing a task in Windows, you can use a troubleshooter called the Problem Steps Recorder to record the steps you perform on a computer. The Problem Steps Recorder captures and saves the screen image each time you click, and includes a text description of where you clicked. As part of the process, you can save the captured images and text in a zipped file and send it to a support professional or someone else helping you troubleshoot a computer problem. To start the Problem Steps Recorder troubleshooter, open the Control Panel, search for "problem steps," and then click Record steps to reproduce a problem in the search results.

For most applications, Windows takes a different approach and provides a troubleshooter you can use to select and test compatibility settings that might fix the problems in the older application. However, you should not use the troubleshooter with older antivirus applications, disk utilities, or other system software because the troubleshooter might remove data or create a security risk. In those cases, you should contact the software developer or visit the Windows Store for the most recent version of the software.

In Step-by-Step 9.2, you use two troubleshooting wizards designed to resolve problems with potentially incompatible applications and with Windows Update.

Step-by-Step 9.2

1. In the Action Center window, click the **Troubleshooting** link. The Troubleshooting window opens. See **Figure 9–8**.

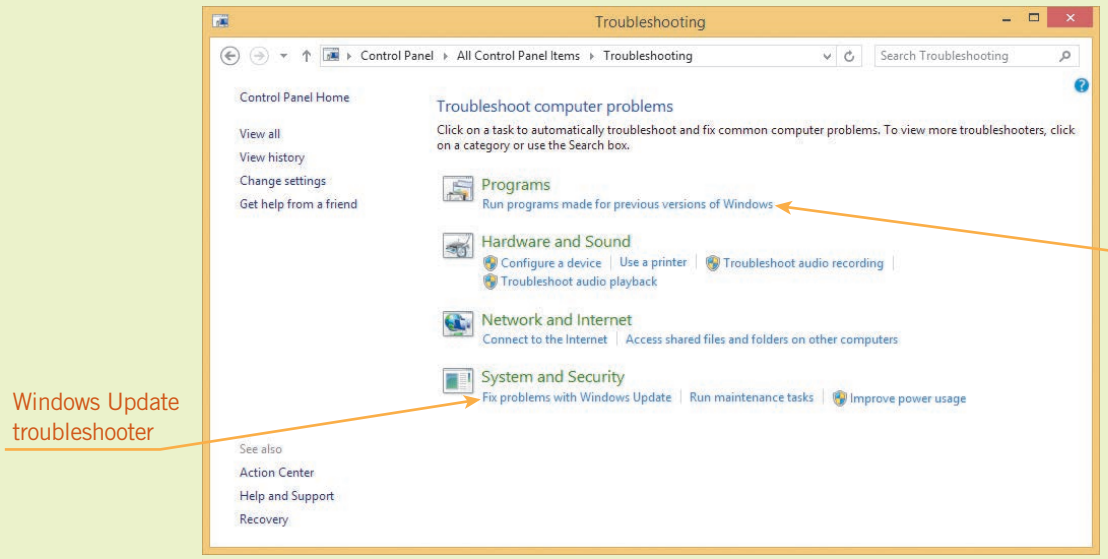


FIGURE 9–8 Troubleshooting window

2. Click the **Run programs made for previous versions of Windows** link in the Programs category. The Program Compatibility Troubleshooter starts.
3. Click the **Next** button. Windows scans your computer, and then lists installed applications. If possible, select an application that has not run smoothly on your computer.
4. Click the **Next** button. If the application was developed for an earlier version of Windows, the troubleshooter gives you two options: Try recommended settings or Troubleshoot program.

   If the application was developed for a compatible version of Windows, the troubleshooter lists possible problems. In that case, click the **Cancel** button, and then read but do not perform Steps 5 through 8.

5. Click **Try recommended settings**. Windows detects which operating system the program is designed for and then applies appropriate system settings, if possible. See **Figure 9–9**.

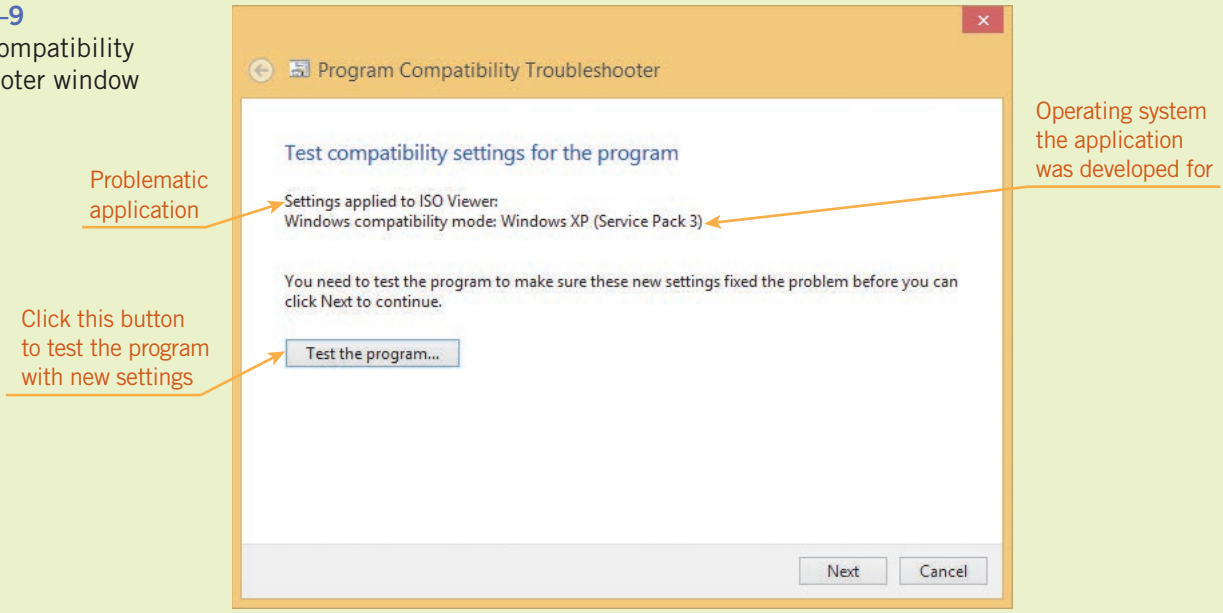


FIGURE 9–9
Program Compatibility Troubleshooter window

6. Click the **Test the program** button. If a User Account Control dialog box opens, click the **Yes** button. If the compatibility problem has been fixed, the older application starts and runs correctly. If the older application does not start, you probably need to upgrade the older application.
7. Close the older application, and then click the **Next** button in the Program Compatibility Troubleshooter window to display a window asking if the program has been fixed. If it has, click **Yes, save these settings for this program**. Windows saves the settings, generating a report that provides a summary. If the program has not been fixed, you could try again with different settings or report the problem to Microsoft and check online for a solution.
8. Click the **Close** button to close the Program Compatibility Troubleshooter window and return to the Control Panel Troubleshooting window. Next, you will run the Windows Update troubleshooter.
9. Click the **Fix problems with Windows Update** link in the System and Security category. The Windows Update troubleshooter starts.
10. Click the **Next** button. The Windows Update troubleshooter scans your computer for potential problems with Windows Update and displays any it finds in the next dialog box.

11. If the troubleshooter finds problems with administrator permissions, click **Try troubleshooting as an administrator**. (If you are not allowed to troubleshoot as an administrator, skip this step.) The troubleshooter continues to scan for problems, fixes them if it can, and then displays the results. See **Figure 9–10**. In this case, the Windows Update troubleshooter identified and fixed two problems with Windows Update.

QUICK TIP

The troubleshooter might not find or fix problems on your computer.

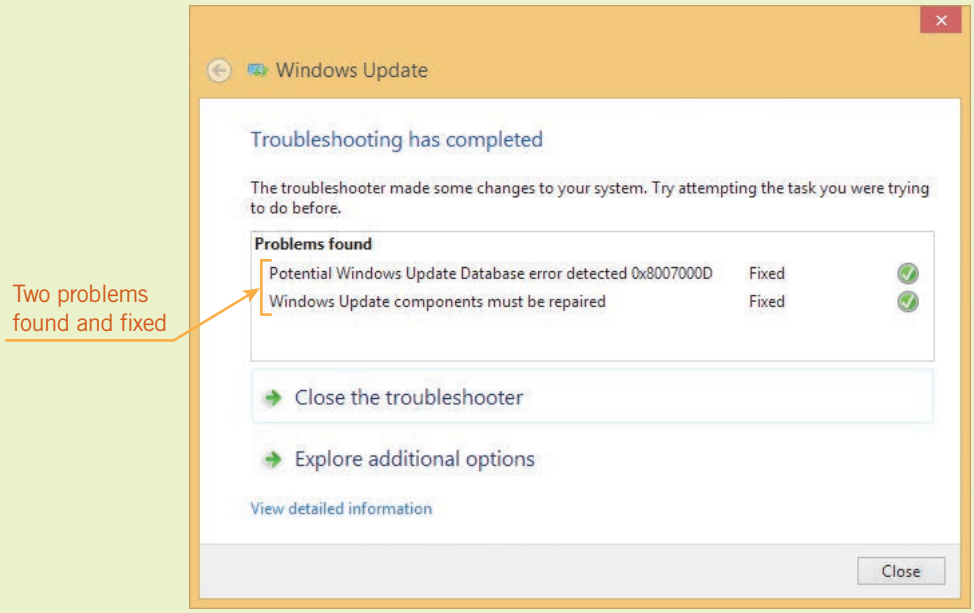


FIGURE 9–10
Windows Update problems identified and fixed

12. Click the **Close** button to close the Windows Update troubleshooter. Leave the Control Panel Troubleshooting window open for the next Step-by-Step.

Removing Malware

IC3 1-4.1.3

Recall from Lesson 8 that malware such as viruses and spyware can infect your computer any time you visit a Web site or open an e-mail attachment. Because malware can download, install, and run on your computer without your knowledge or consent, it's often difficult to know if it is infecting your computer.

Your best protection against malware is to use the current version of your antivirus and antispyware software to scan e-mail messages, attachments, and other files on your computer for viruses, worms, and other types of malware. Antivirus software locates a virus by comparing identifying characteristics of the files on your computer to the characteristics of a list of known viruses, which are called ***virus definitions***. When it finds malware, antivirus software notifies you and takes action to protect your computer from harm. Because new malware is being released daily, you need to keep the virus definitions up to date through the antivirus software's update feature. The same is true of antispyware software, though it refers to a list of known spyware as ***spyware definitions***.

VOCABULARY

virus definition

spyware definition

Windows and Mac OS X include antivirus software among their operating system tools, though you can install antivirus software from other developers (called third-party applications) such as Norton Antivirus and McAfee Antivirus. The antivirus software built into Mac OS X is called XProtect, which scans downloaded files for malware. As added protection, Mac OS X includes Gatekeeper, which allows you to restrict your Mac to running apps only from the Apple App Store. Using apps exclusively from the App Store is the primary way Mac OS X protects a computer from malware. Windows computers come with Windows Defender, which was introduced in Project 3 of Lesson 8. On either type of computer, if you install a third-party antivirus application, you should disable XProtect or Windows Defender because multiple antivirus applications running simultaneously can conflict with each other. Only one antivirus application should be running on your computer at any time.

In Step-by-Step 9.3, you use the Action Center to check whether antivirus software other than Windows Defender is running on your computer. If it's not, you can use Windows Defender to scan for both viruses and spyware. (If an application scans for both viruses and spyware, it is sometimes called an antimalware application.) You can run a quick scan, a full-system scan, or a custom scan. A quick scan checks the locations on your computer that viruses and spyware are most likely to infect. With a custom scan, you select the locations you want Windows Defender to check. In the following steps, you perform a quick scan.

Step-by-Step 9.3

1. In the left pane of the Troubleshooting window, click **Action Center** to return to the Action Center window.
2. In the right pane, click **Security** to expand the Security section and display its settings. See **Figure 9–11**. Your settings might differ.

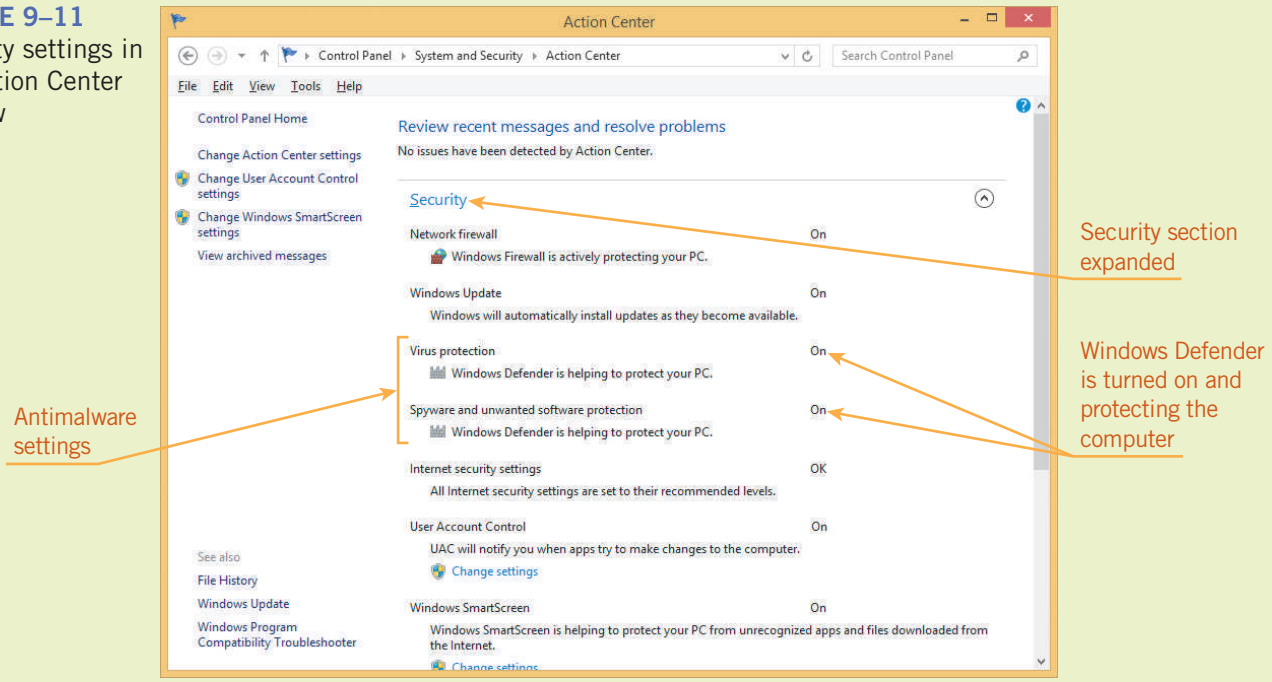


FIGURE 9–11
Security settings in the Action Center window

3. Examine the settings in the Virus protection section and the Spyware and unwanted software protection section. These settings indicate which antivirus and antispyware software is running on your computer. In Figure 9–11, the Action Center window reports that Windows Defender is turned on and protecting the computer from all types of malware.
4. Close the Action Center window. If only Windows Defender is running on your computer, display the Charms bar, click the **Search** charm, begin to type **windows defender**, and then click **Windows Defender** in the search results to start the application. See **Figure 9–12**, which shows that Windows Defender is up to date. Your settings might differ.

QUICK TIP

If an application other than Windows Defender is listed in both the Virus protection and the Spyware and unwanted software protection sections, read but do not perform Steps 4–7.

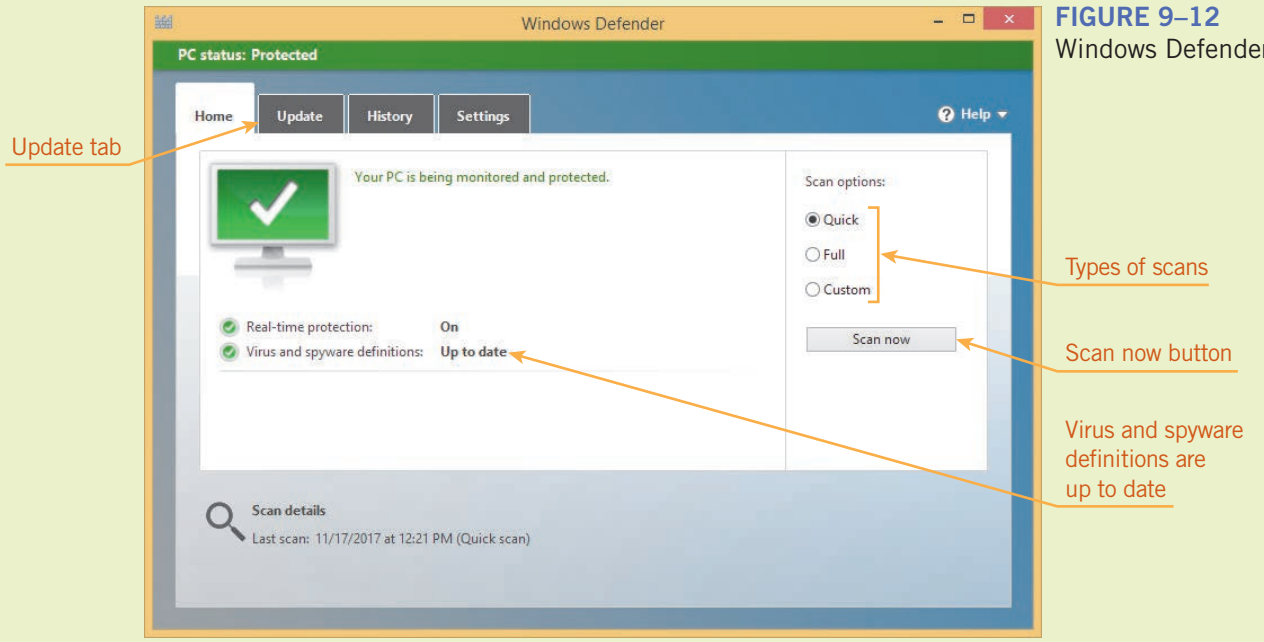


FIGURE 9–12
Windows Defender

5. If Windows Defender is not up to date, click the **Update** tab, and then click the **Update** button. Windows Defender checks for software and malware definition updates, downloads and installs any updates, and then reports the update status.
6. If necessary, click the **Home** tab, click the **Quick** option button to select it (if necessary), and then click the **Scan now** button. Windows Defender scans your computer, displaying first its progress and then the results of the scan. Depending on the number of programs on your computer, your scan might take a few minutes. Wait for the scan to finish and for Windows Defender to display the results before continuing.
7. Close Windows Defender.

VOCABULARY
quarantine
Safe mode

If antivirus or antispyware software finds suspicious files when it scans your computer, it usually places them in ***quarantine***, which means it moves the files to another location on your computer to safely segregate them from other files. Quarantined files cannot run, so they cannot harm your computer. Most antivirus and antispyware software gives you the option of deleting or restoring quarantined files. In case the quarantined files are safe files your computer needs, keep the files in quarantine for a few days. If you don't have any computer problems since the files were quarantined, you can remove them to free disk space. If you continue to have computer problems, research the filenames of the quarantined files online to determine whether they are safe to restore.



1-4.1.4

Using Safe Mode

If the operating system doesn't start normally when you turn on your computer, it might restart in Safe mode so you can resolve or troubleshoot the startup problem. ***Safe mode*** is a troubleshooting option for operating systems that starts your computer with only basic services and functionality. If the computer doesn't automatically restart in Safe mode, you can start in Safe mode manually. On a Mac, you start in Safe mode by performing the following steps:

1. Turn on or restart the computer while you are pressing and holding the Shift key.
2. Hold the Shift key until the Finder loads completely.

On a Windows computer, you start in Safe mode by performing the following steps:

1. Display the Charms bar, click the Settings charm, and then click Change PC settings to display the PC settings screen.
2. Click Update and recovery in the left pane to display options for updating and recovering the operating system, and then click the Recovery category in the left pane.
3. In the Advanced startup section in the right pane, click the Restart now button to display the Choose an option screen.
4. Click the Troubleshoot button to display the Troubleshoot screen, and then click Advanced options to display the Advanced options screen.
5. Click the Startup Settings button to display the Startup Settings screen.
6. Click the Restart button to restart the computer and display the Startup Settings screen instead of the usual screen that appears when you start the computer.
7. Press the 4 key to select Enable Safe Mode, and then enter your password if prompted to display the desktop in Safe mode, shown in **Figure 9–13**. Windows Help and Support opens to display the Safe mode Help topic in case you need help with Safe mode.

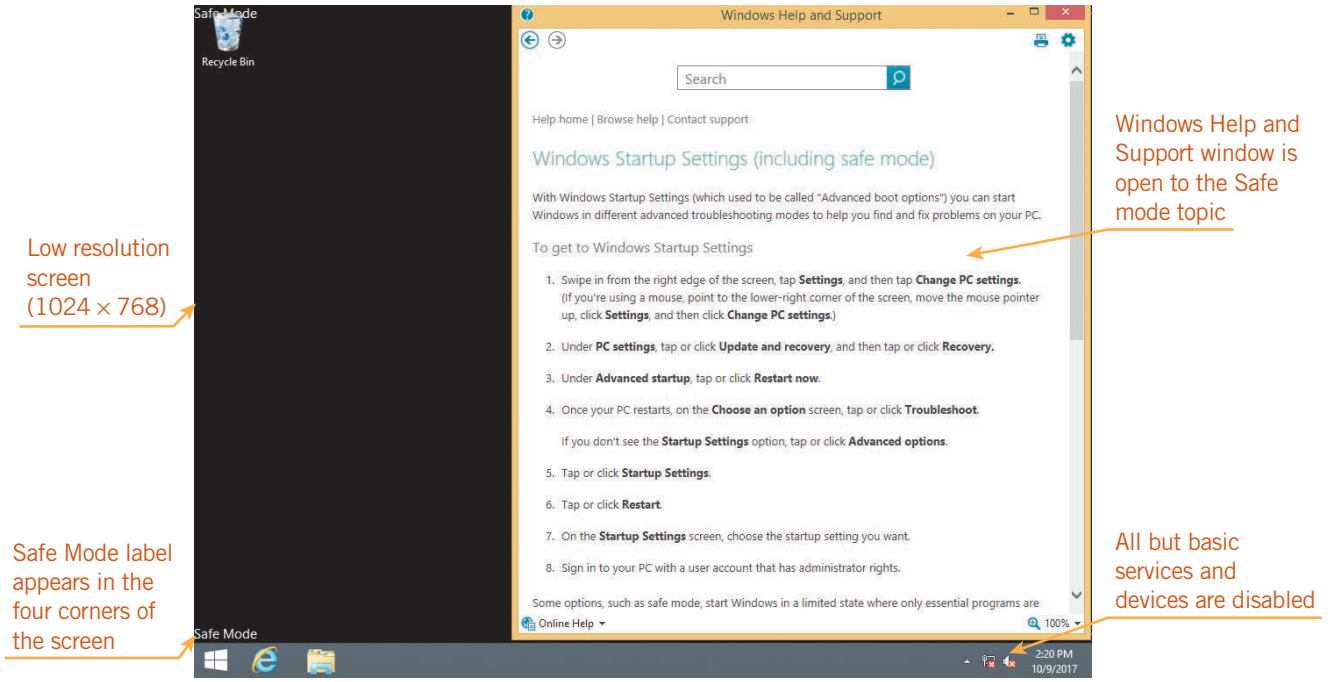


FIGURE 9–13 Windows in Safe mode

Because Safe mode uses only the most basic settings and drivers, the screen appears in its lowest resolution with no background image, the computer is not connected to the Internet, and peripheral devices such as speakers are disabled. "Safe Mode" also appears in the four corners of the screen to indicate that Windows is in Safe mode. Mac OS X displays a similar basic screen when in Safe mode.

Often, starting in Safe mode alone resolves a startup problem, which might be the result of a background program not loading correctly. Try restarting the computer immediately after starting in Safe mode to see if the problem recurs.

If the problem recurs in normal mode but not in Safe mode, you can eliminate the default settings and basic device drivers as possible causes. Next, start each application you normally use to see if it opens in Safe mode. On a Windows computer, start Task Manager and then click the Startup tab to display a list of software that starts and runs in the background after Windows loads. Start as many of these programs as possible. If an application does not open in Safe mode, reinstall it to see if that solves the problem.

If you have recently installed software on a Windows computer, the software might not be compatible with your version of Windows or might introduce other problems that are difficult to track. You can restore your computer to an earlier point using the ***System Restore*** feature, a system utility that helps you restore system files to an earlier state, usually one during which the startup problem did not occur. You use System Restore to undo system changes without affecting your data files.

If you have recently installed new hardware, the driver might be incompatible with the operating system on your computer. Try uninstalling the hardware and restarting the computer. If it starts normally, the new hardware was most likely the cause of the problem. Check the device manufacturer's Web site to make sure the device is compatible with your version of your operating system. If it is, reinstall the device, and then use the operating system's update tool, such as Windows Update, to check for and install the most recent driver.

On a Mac, a startup problem is often caused by a damaged file Mac OS X needs to start properly. Run the Disk Utility to find and repair file problems.

After resolving a problem in Safe mode, you must restart your computer to return to normal operations.

QUICK TIP

Some applications also have a Safe mode. For example, Firefox is a popular browser that you can start in Safe mode to troubleshoot problems visiting and displaying Web pages. If iTunes is running erratically, you can start it in Safe mode to diagnose and solve the problem. When you start an application in Safe mode, it starts without running features from third-party developers, which are called add-ons or plug-ins.

VOCABULARY

System Restore

1-4.1.1
1-4.1.5

Troubleshooting Hardware

Problems with a computer's internal hardware affect the computer's ability to start and run, so they are major problems that need to be addressed as soon as you notice them. Symptoms of internal hardware trouble include the following:

- *Beeps during POST*—Recall that when you start a computer, it performs the power-on self test (POST) to check critical system components and make sure they are running properly. These components include the processor, RAM, and the video card. Some computers beep if these components are working normally or do not beep at all. Other computers flash lights on the keyboard instead of using beeps. Search the computer manufacturer's Web site to learn what these codes or their absence signal. An error during POST usually means one of the critical system components is damaged or failing and needs to be replaced. After a POST error, the operating system might start in Safe mode or display a message indicating you should start in Safe mode so you can troubleshoot the problem.
- *Hard drive makes unusual sounds*—If you use your computer often, you are probably aware of the normal sounds it makes as it saves files on the hard drive, which might include whirring or spinning sounds. If a mechanical hard drive makes an unusual sound, such as grinding, clicking, or prolonged spinning, it might have a problem that will eventually cause it to fail. If it suddenly takes a long time to save files, your hard drive is on the brink of failure. Back up your data (see Lesson 10 for instructions), use a disk-checking utility to scan the drive for errors, and plan to replace the drive soon.
- *Display screen is blank, garbled, or includes blank areas*—These are all symptoms of a damaged video card, which can be affected by power surges. A ***power surge*** or spike is a boost to the electrical charge that powers the computer, and can occur during lightning storms, power outages, short circuits, and other disruptions to a computer's power source. Power surges can also damage hard drives and RAM. You can test for video card failure by attaching a different monitor to your computer. If the new monitor does not display information correctly, replace the video card.
- *Frequent software crashes, unusual messages, or deteriorating performance*—If the operating system crashes or displays messages that don't seem to relate to your current activities, suspect a problem with RAM. Also suspect RAM failure if the computer performs a task normally shortly after starting, but takes much more time to perform the same task later in the session. Use tools such as Task Manager to track how much memory is installed on the computer. If the tool reports less RAM than was originally installed, you need to replace a memory module.
- *Computer does not start at all*—If the computer does not even complete POST or fails shortly after POST, the power supply, processor, or motherboard might need to be replaced. Considering that the processor is the most expensive component in your computer, you might consider replacing the entire computer in this case.

VOCABULARY
power surge

All of the troubleshooting methods you can use with software also apply to hardware, including operating system options such as troubleshooters, Safe mode, knowledge base articles, and online forums. In addition, on a Windows computer, you can use Device Manager to check the status of hardware, uninstall and reinstall drivers, disable and enable the device, and scan for hardware changes. Lesson 5 includes a complete list of troubleshooting steps to use with Device Manager.

On a Mac, you troubleshoot hardware problems using the Apple Hardware Test, which automatically tests system components and then displays the test results. You can look up the error codes and messages displayed in the results by accessing the Apple knowledge base. To start the Apple Hardware Test, press and hold the D key as the Mac starts.

Troubleshooting Firmware

1-4.2.1

Computer hardware manufacturers occasionally release updates to firmware, the software that permanently resides on a chip or other hardware component to control a device. Updates to firmware usually enhance features or fix bugs, so you should consider firmware updates when troubleshooting hardware problems, especially those involving smartphones and tablets, which receive firmware updates more frequently than other types of computers.

To find out about firmware updates, register a computer or device with the manufacturer, who will alert you, usually by e-mail, when the firmware needs to be updated. You can also find out about firmware updates by visiting the manufacturer's Web site and online forums.

You update the firmware for a computer or device by connecting to the Internet and then selecting an option on the device itself for updating the firmware. Before applying a firmware update, make sure the update is for the exact model of your computer or device. Check the model number on the device itself or in its documentation and apply a firmware update only if it is intended for your model. When you update firmware, the old firmware is removed completely. If the new firmware is not compatible with your computer or device, it will not work at all with the new firmware.

QUICK TIP

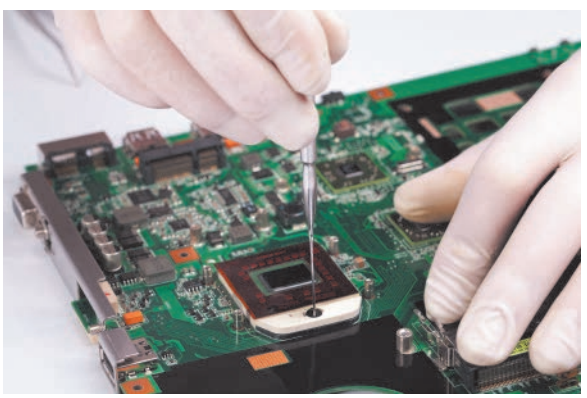
Applying a firmware update that makes it impossible to use a device is called *bricking* the device.

Checking Cables and Connections

1-4.2.2

Before replacing any internal components or the computer itself, follow the troubleshooting steps to try the easiest fixes on your own. For example, if your computer doesn't start or stops running suddenly, check the power cords leading to your computer, especially if you recently moved the computer or bumped it, which could have loosened connections. If the display screen is blank on a desktop computer, first make sure the cable from the monitor is securely attached to the system unit. If you are using a mobile computer, make sure the battery has enough charge to run the computer. As you are recharging the battery, check the power adapter cable and its connection to the device to make sure it is securely connected to the device and to the power outlet.

If you decide to work with a PC specialist to repair a computer, ask the specialist to check the internal cables and connections before replacing components. Because system components are connected to the internal circuitry and depend on each other for basic operations, reseating or reconnecting a component such as the CPU, ROM, or a memory module might solve a seemingly serious problem. See **Figure 9–14**.



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FIGURE 9–14 Securely connecting a system component in a laptop

1-4.2.1
1-4.3.1
1-4.3.2
1-4.3.3

Troubleshooting Peripheral Devices

In some ways, problems with peripheral devices are easier to troubleshoot than problems with internal computer hardware because you can access the devices more easily. However, peripheral devices can experience a wider range of problems than internal components, so it can take longer to find the right solution. In general, check the following information as you troubleshoot any peripheral device:

- *Cables and connections*—As with internal components, make sure peripheral devices are properly and securely connected to your computer. The operating system might not recognize a device if it is loosely connected to a port on the computer.
- *Compatibility*—Determine whether the device is designed to run with the version and operating system installed on your computer. Compatibility information is included on the packaging of a device and on the Web site of a device manufacturer. If you are using the most recent version of Windows and try to install a device designed only for Windows XP and earlier, the device probably will not work correctly.
- *Drivers*—The operating system needs a compatible driver to interact with a peripheral device. Recall that in most cases, drivers are provided with operating systems and are updated as necessary. If a peripheral device is not working correctly, you can try updating the driver yourself from an optical disc provided with the device or from the manufacturer's Web site.
- *Firmware*—To update firmware for a peripheral device, you typically connect the device to your computer, and then connect the computer to the Internet, if necessary. Visit the Web site of the device manufacturer, navigate to the support page for your device, check the model number, and then follow the instructions for updating the firmware.

WORKPLACE READINESS

Troubleshooting on the Job

Some of the most challenging and rewarding experiences in a career come from solving problems. You also increase your value to an employer if you have excellent troubleshooting skills. Defining a problem and gathering information about it can be effective, even for complex problems. Finding and applying possible solutions can demand a combination of technical knowledge and imagination. If you are running out of obvious solutions to a problem, try thinking creatively. Reconsider your definition of the problem—what seems like a hardware problem, for example, might actually be a software glitch. For critical problems, work with a group to brainstorm ideas. When you brainstorm, you generate as many ideas as you can without pausing to critique or edit them. After you run out of ideas, you can narrow the ideas to only practical ones. Continue to work with others to solve problems. Each person in the group can contribute knowledge and experience, which often leads to new and valuable insights.

SUMMARY



In this lesson, you learned:

- Troubleshooting means to take a logical, systematic approach to identify the source or cause of the problem, and then apply a solution so that the computer is working normally again.
- Troubleshooting typically involves the following four steps: define the problem, identify possible causes, determine the most likely cause, and apply solutions.
- When you have any type of computer problem, you can find valuable troubleshooting information in knowledge bases and online forums. A knowledge base is a collection of articles, videos, and other sources containing information about a product or topic. At an online forum, users and technical experts conduct conversations to solve computer problems.
- Common problems with software include not starting, not running, and causing problems with other software. These problems can be solved by reinstalling the software, restarting the computer, and updating the software.
- Operating systems include diagnostic tools that help you troubleshoot software problems, including those with the operating system itself. These tools include Task Manager or Activity Monitor, problem reports, and automated troubleshooters.
- Operating systems keep track of software errors in logs, which are text files stored in a system folder. When you have a serious software problem, you can send a problem report to Apple or Microsoft. The problem report contains a copy of the error data, including details about the problem, such as the name and version of the application, when the error occurred, and technical information about the state of the system at that time.
- Solutions to Windows and application problems include links to Help articles, files to download, and steps to perform. When a solution is available, Microsoft sends a message to the Action Center on your computer so you can access the information.
- For some software and hardware problems, operating systems offer automated troubleshooters, which are tools that take you through a series of dialog boxes to check settings and then change them as necessary so you can perform certain tasks.
- Your best protection against malware is to use updated versions of antivirus and antispyware software to scan your computer for malware and then remove it or quarantine it. This type of software locates malware by comparing identifying characteristics of the files on your computer to the characteristics of known malware, which are called virus definitions and spyware definitions.
- If antivirus or antispyware software finds suspicious files when it scans your computer, it usually places them in quarantine, which means segregating the suspicious files from the rest of your file system. Quarantined files cannot run, so they cannot harm your computer.
- Safe mode is a troubleshooting option for operating systems that starts your computer with only basic services and functionality. If the operating system doesn't start normally when you turn on or restart your computer, it might start in Safe mode automatically. You can also start in Safe mode manually to resolve or troubleshoot the startup problem.
- Problems with a computer's internal hardware affect the computer's ability to start and run, so they are major problems that need to be addressed as soon as you notice them. Symptoms of internal hardware trouble include beeps and flashing lights during POST, unusual sounds from the hard drive, blank areas on the display screen, frequent crashes, and failure to start.
- For hardware problems involving smartphones and tablets, check the manufacturer's Web site for firmware updates, which are often issued to fix bugs. The firmware in peripheral devices might also need to be updated to resolve compatibility errors.
- To troubleshoot problems with peripheral devices, start by checking cables and connections to make sure the device is properly and securely connected to your computer. Determine whether the driver is compatible with your operating system and that you have the most recent driver installed.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. On Windows computers, you can run Windows Defender and one other antivirus application at the same time.

T F 2. At an online forum, threads are saved in an archive that you can search to determine if your problem has already been solved.

T F 3. You should automatically install firmware updates for a device, even if the firmware is intended for a different model.

T F 4. To find the most likely cause of a problem, you work through a process of elimination.

T F 5. Starting in Safe mode and then restarting the computer often resolves a computer startup problem.

MULTIPLE CHOICE

Select the best response for the following statements.

1. An error during _____ usually means a critical system component is damaged or failing.
   A. malware scanning
   B. POST
   C. Safe mode
   D. Shut down
2. In Windows, you use _____ to close an unresponsive application.
   A. Task Manager
   B. Windows Defender
   C. Safe mode
   D. Application Manager
3. If antivirus software finds suspicious files when it scans a computer, it usually places them in _____.
   A. a problem report
   B. quarantine
   C. firmware
   D. a virus definition
4. If an operating system doesn't start normally when you turn on or restart your computer, you can try starting in _____ to resolve or troubleshoot the startup problem.
   A. Recovery mode
   B. Compatibility mode
   C. Safe mode
   D. Troubleshooting mode
5. A(n) _____ is a boost to the electrical charge that powers a computer and can damage internal system components.
   A. power surge
   B. wizard
   C. energy surge
   D. thread

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. Describe the four steps typically included in the troubleshooting process.

2. If an operating system does not start or starts and then freezes, what are the possible solutions?

3. What is the downside of using Task Manager to close an unresponsive application?

4. What is the easiest way to solve the problem of an unsuccessful software update? What should you do if you suspect the updating tool itself is damaged?

5. How does Mac OS X handle incompatible applications when you upgrade the operating system?

6. How does Windows handle incompatible applications?

7. How does antivirus software identify potential viruses?

8. What is Safe mode and when should you use it?

9. What should you do if the hard drive makes an unusual grinding sound and suddenly takes a long time to save files?

10. Why should you ask a PC specialist to check internal cables and connections before replacing components?

PROJECTS

PROJECT 9–1

In this project, you use an automated troubleshooter to investigate a printer problem. As you use the troubleshooter, you take screenshots of the troubleshooter dialog boxes. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. Open the Control Panel. In the System and Security category, click **Find and fix problems** to open the Troubleshooting window.
2. In the Hardware and Sound category, click **Use a printer** to start the Printer wizard and then press the **Alt+Print Screen** keys to capture an image of the troubleshooter. Save the image as a Paint file named **Printer Wizard**.
3. Click the **Next** button. If your computer can access more than one printer, the next dialog box asks which printer to troubleshoot. Select the printer you use most often, and then click the **Next** button.
4. When the troubleshooter stops detecting problems and displays possible solutions, if any, press the **Alt+Print Screen** keys to capture an image of the troubleshooter. Save the image as a Paint file named **Printer Fix**.
5. If necessary, click **Skip this fix** to finish troubleshooting. In the dialog box that indicates troubleshooting is complete or that troubleshooting couldn't identify the problem, click **Explore additional options** to display the Additional Information window.
6. Press the **Alt+Print Screen** keys to capture an image of the Additional Information window. Save the image as a Paint file named **Additional Information**.
7. Close all open windows.

PROJECT 9–2



1-4.1.5

In this project, you visit the Microsoft Community Web site and the Microsoft Support Web site to learn about solving problems with updating Windows. You take screenshots as you explore the Web sites. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. Open Windows Help and Support, and then click **Microsoft Community website** on the Help home page to open the Web site in Internet Explorer.
2. Click the **Windows Version** arrow button, and then click the version of Windows you are using, such as Windows 8.1.
3. Click the **Windows Topics** arrow button, and then click **Windows Update**.
4. Click the **Apply** link to apply your selections to filter the results and show threads about updating your version of Windows. Press the **Alt+Print Screen** keys to capture an image of the Microsoft Community window. Save the image as a Paint file named **Microsoft Community**.
5. Find a thread with more than 10 views and at least one reply, and then click the thread to display the original message and responses to it. Press the **Alt+Print Screen** keys to capture an image of the window. Save the image as a Paint file named **Thread**.
6. Read the discussion, and then click a link in the Related Content list. If the thread does not have a Related Content list, close this thread, and open others until you find a Related Content list.
7. Press the **Alt+Print Screen** keys to capture an image of the window. Save the image as a Paint file named **Related Content**.
8. In the Address bar, type **support.microsoft.com**, and then press the **Enter** key to display the Microsoft Support Web page.
9. Scroll to the bottom of the page, and then click **Knowledge Base search** in the Support category.
10. In the Search box, enter **Windows Update**, and then press the **Enter** key to display the results.
11. Press the **Alt+Print Screen** keys to capture an image of the window. Save the image as a Paint file named **Knowledge Base**.
12. Close all open windows.

PROJECT 9–3

In this project, you visit the Web site of your computer's manufacturer to learn about beep codes or LED keyboard lights during POST. You take screenshots of the Web site as you explore it. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests. Some steps require you to perform new tasks or solve problems independently.

1. Start Internet Explorer, and then visit the Web site of your computer's manufacturer, such as hp.com, dell.com, or toshiba.com.
2. Navigate to the Support section of the Web site, and then look for a way to find the Web page supporting your computer.
3. Continue exploring the Web site to find information about beep codes. You probably need to search for "beep codes" at some point.
4. When you find a Web page explaining the meaning of beep codes or LED light codes, press the **Alt+Print Screen** keys to capture an image of the Web page. Save the image as a Paint file named **POST Codes**.
5. Close all open windows.

TEAMWORK PROJECT

You work as a sales representative for a sporting goods manufacturer and often travel to visit clients in their stores and offices. You use a tablet running the latest version of Windows RT during the visits, and often need to connect to the Internet with the device. Your manager asks you and another sales representative to learn about mobile broadband technology to connect to the Internet. He is particularly interested in troubleshooting mobile broadband connections. Work with a partner to complete the following steps.

1. One partner should research mobile broadband technology in Windows Help and Support. The other partner should research mobile broadband technology using other Microsoft sources, including the Microsoft Community.
2. Collaborate to create a document that includes the following information:
   - Definition of mobile broadband technology and how it's different from other types of Internet connections
   - Requirements for setting up a mobile broadband connection
   - Troubleshooting information for solving common mobile broadband connection problems. List at least three problems, the possible reasons for the problems, and a suggested solution.
3. Submit the completed document as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 9–1

Use the troubleshooting steps in this lesson to solve a computer problem you have experienced. Complete the following steps.

1. Define the computer problem you experienced. Be as specific as possible.
2. Identify possible causes. List at least four possible causes.
3. Find the most likely cause. How did you determine which cause was the most likely?
4. Choose a solution that you think will solve the problem. How will you apply the solution? What could go wrong with the solution you chose? How could you prevent or minimize the negative effects of the solution?
5. Submit your findings as your instructor requests.

CRITICAL THINKING 9–2

IC3 1-4.3.1

Computer problems can happen without warning, so you need to be prepared to troubleshoot and find solutions based on your experience and on information you can gather. After learning about each of the following problems, research and describe the most likely solutions to each problem.

1. You are working on a laptop when a message appears indicating that the computer might be overheating.
2. You have been using a tablet computer for about six months, and recently noticed that it takes longer than normal for the battery to charge. In addition, the battery doesn't hold the charge for more than 2 hours.
3. You have an iPhone and a new iPad, and you want to sync the devices so that they have the same apps. When you try to sync an app, a message appears on the iPhone indicating the app is not compatible with your device.
4. Submit your responses as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 9–1

1-3.4.4

Learn about the history of antivirus software. Research this topic on at least two Web sites, and then answer the following questions. Submit the written answers as your instructor requests.

1. Who developed one of the first academic papers on computer viruses? When did he later develop strategies for antivirus software? Did he think a single algorithm could detect all possible viruses?
2. How were viruses spread before Internet usage became commonplace?
3. What was the Elk Cloner and why is it significant?
4. What are four techniques antivirus software developed in the early 2000s to detect viruses?

ONLINE DISCOVERY 9–2

1-4.1.4

Safe mode is one of the advanced startup options provided by Windows. The startup options include several variations on Safe mode, such as Safe mode with networking. Research the following advanced startup options, and then describe each one. Submit the written descriptions as your instructor requests.

1. Safe mode with networking
2. Safe mode with command prompt
3. Last Known Good Configuration
4. Repair your computer

JOB SKILLS

Computer security is a major concern of businesses no matter their size. Research the types of jobs and careers for someone interested in computer security. Complete the following steps.

1. Use online resources to research jobs available for people interested in computer security, information security, and computer forensics. What types of jobs are available? What are the job descriptions for these positions?
2. What types of certification are available?
3. What can computer security professionals expect to earn in salary?
4. Submit your findings to your instructor as requested.

EXPLORE AND SOLVE

Did you know?

- You can view Windows event logs using Event Viewer, which tracks details of system events that might affect your computer's performance.
- You can also look up event IDs to troubleshoot system problems.

1. Open the Control Panel, search for **event viewer**, and then click **View event logs** in the search results.
2. Press the **Alt+Print Screen** keys to capture an image of the Event Viewer window. Save the image as a Paint file named **Event Viewer**.
3. In the left pane, expand **Windows Logs**, if necessary, and then double-click **Application** in the left pane.
4. Scroll the list of events in the middle pane, and then double-click a **Critical** event to open the Event Properties window. If a Critical event is not listed, double-click a Warning or an Error.
5. Press the **Alt+Print Screen** keys to capture an image of the Event Properties window. Save the image as a Paint file named **Event Properties**.
6. Find the Event ID for this error, and then click the **Event Log Online Help** link. If a message appears asking for your permission to send the information over the Internet, click the **Yes** button.
7. If necessary, search for the Event ID in the Web page that opens. When you find help information on the event, press the **Alt+Print Screen** keys to capture an image of the Internet Explorer window. Save the image as a Paint file named **Event Log Help**.
8. Close all open windows.



Estimated Time:
1 hour

LESSON 10

Data and Hardware Protection

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Understand types of backups.
- Select a backup method.
- Determine a schedule for backing up data.
- Back up and restore files and folders.
- Protect a computer from theft and physical damage.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

backup
backup plan
backup software
differential backup
encryption
full system backup
incremental backup
local backup
online backup
redundancy
remote backup
restore
selective backup
synchronize
uninterruptible power supply (UPS)

Microsoft product screenshots used with permission from Microsoft Corporation.

In this lesson, you learn about backing up and restoring files. You examine the types of backups and explore your options for how to create and where to store backups. You investigate two methods for backing up files, and learn the importance of following a backup plan. Besides using backups to protect data, you also learn about ways to protect computer hardware.

1-4.4.1
1-4.4.2
1-4.4.3
1-4.4.4

Backing Up and Restoring Files

VOCABULARY

backup

restore

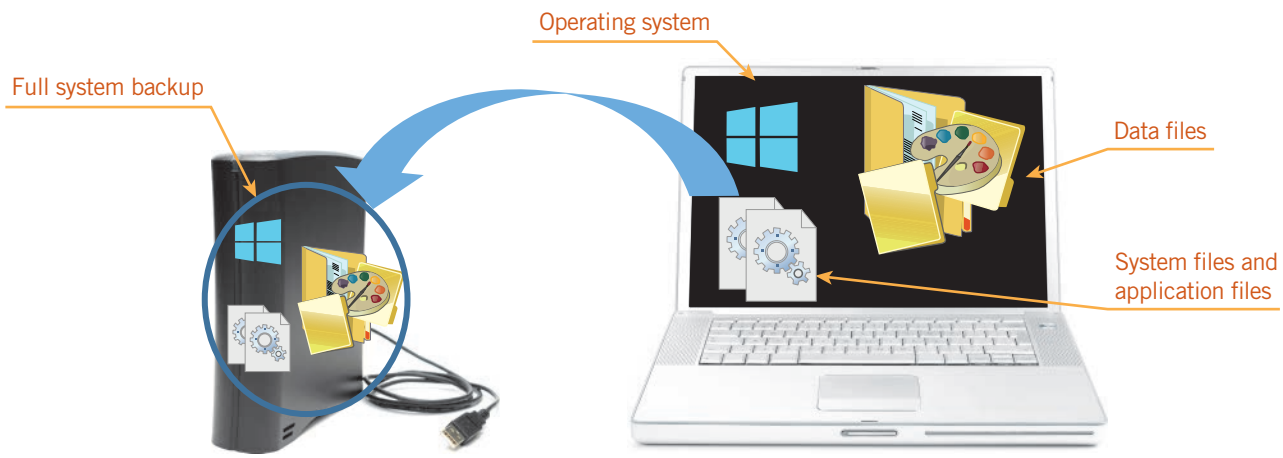
full system backup

If you have ever inadvertently deleted a file or folder, overwritten a version of a file you meant to save, or lost data after a hard drive crashed or a virus corrupted files, you know how important it is to back up your computer files. A ***backup*** is a duplicate copy of a file that you use if the original file is lost, damaged, or destroyed. (When written as two words, *back up* means to create a copy of a file.) To use a backup copy of a file, you first need to ***restore*** it, which means to copy the file to its original location on your computer.

Before you back up files, you need to make two major decisions: the type of backup to create and which backup method to use. Depending on which backup method you choose, you might also need to determine where to create and store the backup, and how often to back up. Each of these decisions is discussed in the following sections.

Understanding Types of Backups

The four most common types of backups for individual computer users are full system backups, differential backups, incremental backups, and selective backups. As shown in **Figure 10–1**, a ***full system backup*** (also called a system image or a disk mirror) is an exact duplication of the hard drive, including data files, system files and settings, application files, and the operating system. If your hard drive is destroyed, you could remove it, install a new hard drive, and then restore your files from the full system backup to have the same setup on the new hard drive as you had when you created the backup.

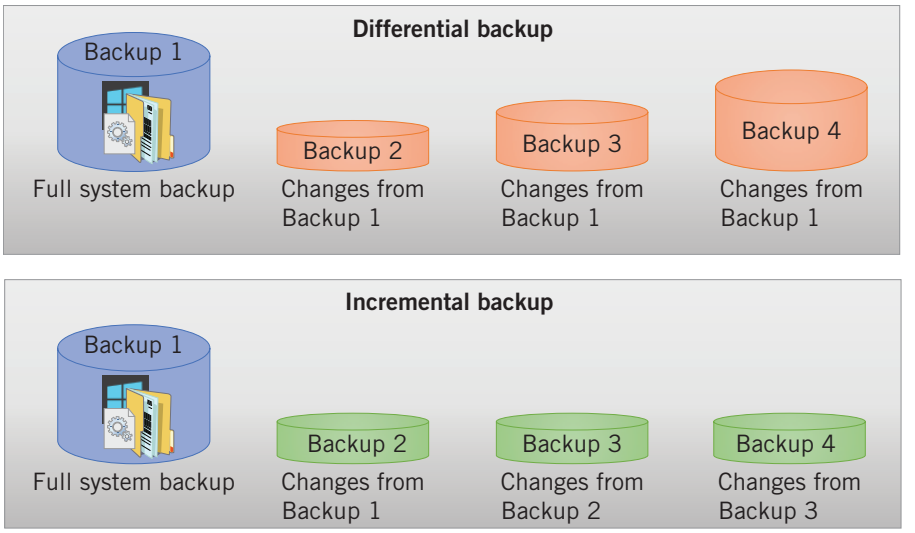


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FIGURE 10–1 Full system backup

As you add and modify files on the hard drive, you also need to back them up. Instead of creating another full system backup to include those files, you can perform a differential backup or an incremental backup. A ***differential backup*** contains copies of the files that have changed since the last full system backup. An ***incremental backup*** contains copies of the files that have changed since the last full system backup or the last incremental backup. See **Figure 10–2**.

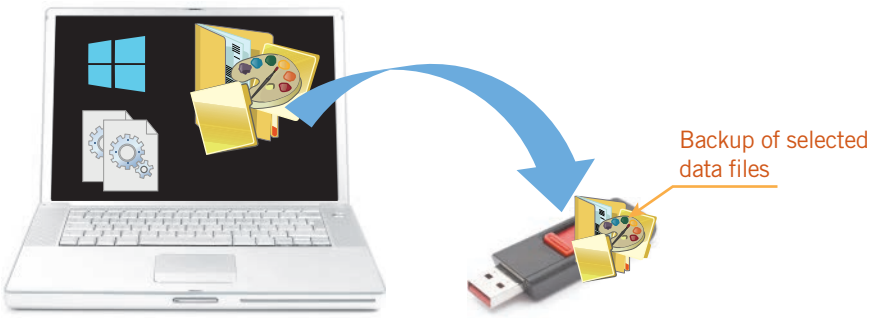
VOCABULARY
differential backup
incremental backup
selective backup



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FIGURE 10–2 Differential and incremental backups

When you perform a ***selective backup*** (also called a partial backup), you select the folders and files you want to back up. Typically, these include the folders containing the documents, pictures, financial records, and other data files you have created or saved. You can also back up data that would be difficult or time-consuming to restore, such as contact records, which might be stored in an e-mail application, and browser favorites or bookmarks. **Figure 10–3** shows a selective backup.



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FIGURE 10–3 Selective backup

You can perform incremental backups to keep a selective backup current. For example, if you create a selective backup of your Documents folder on Monday, you can perform an incremental backup on Tuesday to include any new or modified files from the Documents folder in the backup.

Each of the backup types has advantages and disadvantages, which are summarized in **Table 10–1**.

TABLE 10–1 Advantages and disadvantages of backup types

BACKUP TYPE	ADVANTAGES	DISADVANTAGES
Full system	■ Creates a complete backup you can use to restore a computer	■ Can take a long time to back up a complete system ■ Each backup requires a lot of storage space
Differential	■ Can restore a computer with a full system backup and the latest differential backup ■ Requires less storage space than multiple full system backups	■ Takes longer than an incremental backup ■ Requires more storage space than an incremental backup
Incremental	■ Takes less time than a differential backup ■ Requires less storage space than full system and differential backups	■ Requires multiple steps to restore a computer; you first must restore the full system backup and then restore each incremental backup in order
Selective	■ Can back up and restore files and folders quickly ■ Backs up only data files, not software, which you can reinstall	■ Depending on the data selected for backup, you might not be able to restore a full system

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ABOVE AND BEYOND

For Windows computers, the terms "system recovery disk," "system repair disk," and "system image" are often confused. You use a system recovery disk to restore the computer to its factory settings—the state it was in when you purchased it. A system image produces a similar result, except that you can use it to restore the computer to the state it was in when you created the system image. If the computer doesn't start, you can use a system repair disk to load the essential files Windows needs to start, and then use the system recovery disk or the system image to restore your computer.

VOCABULARY

backup software

As Table 10–1 indicates, incremental backups require careful organization so you can use them to restore a computer. Creating a full system backup and updating it with incremental backups means you need the full system backup and all the incremental backups to restore a computer. In addition, you must restore the incremental backups in the same order they were created, so you need to identify the incremental backups correctly to keep track of their sequence. If you create only one full system backup and update it indefinitely with incremental backups, restoring could take a very long time. To make it easier to restore a computer, you can create full system backups periodically, such as every Friday evening, and then perform incremental backups from Saturday to Thursday. To restore the computer, you would need the most recent full system backup and only six incremental backups.

Selecting a Backup Method

To create a backup, you can use software installed on your computer, or you can use an online backup service provider. Most experienced computer users employ a combination of these methods to make sure they have backups that can reliably restore their files.

Using Backup Software

To create any type of backup, you can use ***backup software***, which is a set of system utilities for creating and updating backups and for restoring files from a backup. Operating systems, third-party software developers, and manufacturers of backup media such as external hard drives provide backup software. Backup software

compresses all the files selected for a backup into a single large file. Along with the compressed files, backup software stores an index of file details, including their original locations, to restore the files when necessary.

Windows 8 provides the following backup and restore software:

- *File History*—Makes incremental backups of files that have changed in specified folders. Instead of writing over versions of the same file, File History keeps copies of each saved version of a file, so if you need a chart you painstakingly created in a document two hours ago, but accidentally deleted the last time you saved and closed the document, you can restore the earlier version of the document containing the chart. File History does not create full system backups.
- *System Image Backup*—Creates a full system backup.
- *Recovery*—Restores files from a system image backup.

Mac OS X computers provide backup software similar to the software for Windows computers. Like File History, Time Machine makes incremental backups of files that have changed on a Mac, and keeps copies of each saved version of a file. Unlike File History, Time Machine does create full system backups.

Data you store on a smartphone or tablet is just as valuable as the data on a desktop or laptop computer. To protect your data and system files, mobile operating systems such as iOS, Android, and Windows RT also include backup software you use to create full system and incremental backups.

You can also install other backup software in addition to or as a replacement for backup software provided by operating systems. **Table 10–2** lists popular backup software for desktop and mobile operating systems.

QUICK TIP

To back up a smartphone or tablet running iOS, you can use iCloud or iTunes. Backing up to iCloud happens automatically when your device is connected to the Internet. To back up using iTunes, you connect your Apple smartphone or tablet to a computer on which iTunes is installed. You can also automatically back up an Android device to Google Drive.

TABLE 10–2 Popular third-party backup software

OPERATING SYSTEM	BACKUP SOFTWARE	NOTES
Windows	Acronis True Image	Creates all types of backups
	Backup Maker	Freeware; designed for the average home user
	Cobian Backup	Freeware; designed for experienced computer users
	Genie Backup Manager	Creates all types of backups
Mac OS X	Carbon Copy Cloner	Similar to Time Machine, but lets you start the computer from a backup
	SuperDuper	Free version does not create incremental backups
iOS	CopyTrans	Shareware; backs up to a PC
Android	Carbon	Free version backs up to an SD card or a PC
	Super Backup	Backs up all of your data, including contacts and call logs

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After installing backup software, you set a schedule and select a location for the backups. To set a schedule, you might need to first turn on automatic backups. The backup software will then follow the default schedule to create backups in the background while you are performing other tasks or while the computer is turned on but idle. The default schedule is designed for average computer usage, so you should change it if you create or modify files on your computer more or less frequently.

When you select a location for backups, be sure to select one other than your hard drive so you can access the backup files in case of hard drive failure or other major computer problems. You typically can choose one of the following locations for creating backup files:

- *External hard drive*—Because of its portability, capacity, and ease of use, an external hard drive is where most experienced computer users create backups. Small external hard drives have a few hundred gigabytes of storage capacity, making them suitable for selective backups, while larger external hard drives with at least 1 TB of storage space are ideal for maintaining full system backups.
- *USB flash drive*—If you are creating a selective backup of a limited amount of data, you can use a USB flash drive, which is inexpensive and convenient for backing up documents and other personal files. However, a single USB flash drive does not have enough capacity to store a full system backup and its updates.
- *Optical disc*—You can use recordable CDs, DVDs, and Blu-ray discs as backup media. Selecting a type of disc that can be read many times but recorded only once is an advantage because it does not allow the data to be changed after it is backed up. However, that means you need a new optical disc for each backup you create. If you want to back up more data than a single optical disc can hold, as you would for a full system backup, most backup software can extend the backup across multiple optical discs. The disadvantage of optical discs is that they are slow to save and access data, so backing up and restoring large files from optical discs takes longer than using an external hard drive.
- *Network folder*—If your computer is on a network, you can create backups to a network folder. You need to have permission to save files in the folder and set sharing options so that unauthorized users cannot access the backup. The network administrator also needs to provide enough storage space for the backups, which might not be practical for large full system backups.

VOCABULARY

local backup

encryption

After creating backups using media attached to your computer—one of the first three options—you can store the medium close to the computer, which is considered a ***local backup***, or take it to an off-site location for safekeeping. Creating and storing a backup on a network folder is also considered a local backup if you are using a local area network, which is a network that links computers within a building or group of adjacent buildings.

In addition to setting schedules and selecting locations, backup software usually allows you to select the following options:

- *Backup type*—You can choose whether to perform a full system, differential, or incremental backup. If you want to create a selective backup, you can select the folders and files to store in a new backup file.
- *Encryption*—***Encryption*** is a security method that encodes data so that only authorized people can access it. Some backup software can encrypt the files in a backup, and then decrypt, or reverse the encryption when it restores the files.
- *Media spanning*—If the backup file grows very large, this feature allows you to use more than one drive to store the backup file. The backup software keeps track of the files stored on each drive and requests the correct drive when you restore selected folders and files.
- *Verification*—After backing up the files, backup software compares every file in the backup location to the corresponding file on your hard drive to make sure it did not skip a file. In addition, you should restore a file or two after creating a full system backup to make sure the restore process works correctly.

QUICK TIP

To be safe, you should create more than one backup and keep each one up to date. Store at least one copy in a safe place near your computer for convenience in restoring files. Store at least one other copy in an off-site location, such as a safe deposit box, a locked file cabinet at home or work, or a network folder. If you store all your backups near your computer, and the computer is damaged from a calamity such as a fire, flood, or intruder, the backups could also be damaged or destroyed at the same time.

In Step-by-Step 10.1, you open the File History window and examine its settings. Although you will not create a backup in the following steps, you need a USB flash drive or other external drive to access all of the File History settings. In the following figures, this drive is shown as Removable Disk (E:).

Step-by-Step 10.1

1. Insert an external drive such as a USB flash drive into a USB port on your computer.
2. Open the Control Panel, and then click the **Save backup copies of your files with File History** link in the System and Security category to open the File History window. **Figure 10–4** shows File History turned off, which it is by default. After selecting settings, you turn on File History by clicking the Turn on button in the File History window. In these steps, you will only examine these settings; you will not select any nor will you turn on File History. Note that you can also use the File History window to access the utility for creating a full system backup.

QUICK TIP

You can also access File History settings on the PC settings screen. Display the PC settings screen, click Update and recovery in the left pane, and then click File History.

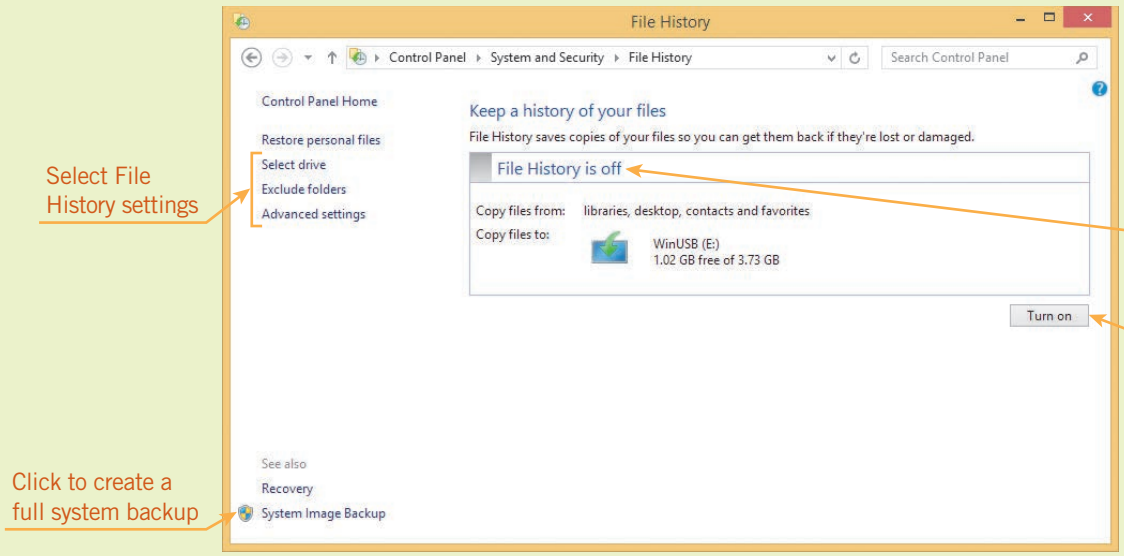


FIGURE 10–4 File History window

3. In the left pane of the File History window, click the **Select drive** link to display the Select Drive window, where you can select the external drive or network folder you want to use for backups.
4. Click the **Back** button at the top of the window to return to the File History window.
5. In the left pane, click the **Exclude folders** link to open the Exclude Folders window. If you did not want to save backup copies of certain folders or files, you could click the Add button to open the Select Folder window, and then select the items to exclude from the backup.
6. Click the **Back** button to return to the File History window.
7. In the left pane, click the **Advanced settings** link to open the Advanced Settings window, where you can specify how often to create backups, choose how long to store file versions, and select other advanced settings.
8. Click the **Back** button to return to the File History window.

If you clicked the Turn on button to turn on File History, the software would start backing up all the files you specified. By default, these files include those in the libraries and on the desktop of your computer as well as all of your favorites and contact files. See **Figure 10–5** .

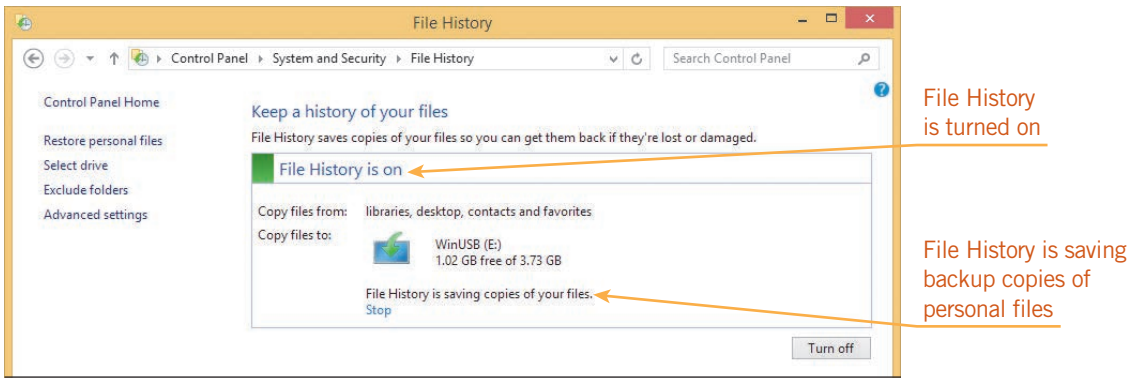


FIGURE 10–5 Backing up files with File History

To back up the files to a network folder and use that location for off-site backups, you would perform the following general steps:

1. In the left pane of the File History window, click the Select drive link to open the Select Drive window.
2. Click the Add network location link to open the Select Folder window listing the network locations your computer can access. See **Figure 10–6**.

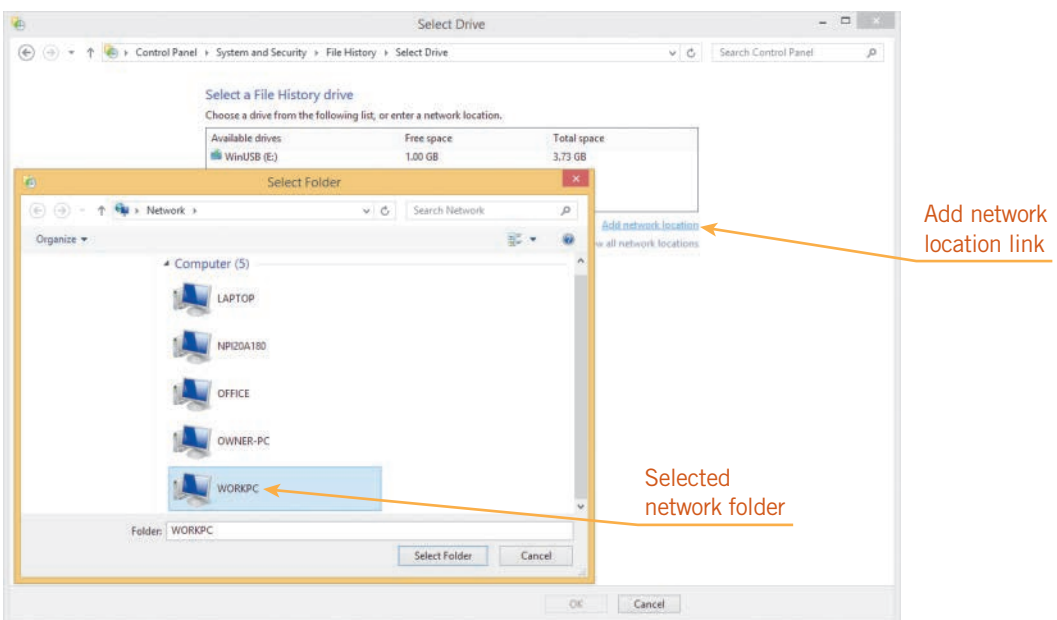


FIGURE 10–6 Selecting a network folder as an off-site backup location

3. Select the network folder you want to use for off-site backups, and then click the Select Folder button. Your computer must be able to access the network folder to create the backups.

You can use File Explorer to restore any version of a file that File History saved. For example, suppose you set up File History to create backups on a network folder. You created and saved a report named "Computer Recycling" in a Documents subfolder named "Reports." As you continue to work on and modify the file, File History backs it up every hour by default. The report originally included a cover page with an illustration representing computer recycling, but during your work, you removed the cover page and subsequently saved the file. Now you want to restore the version of the Computer Recycling report that included the cover page. To do so, you could perform the following steps:

1. Open File Explorer, and then navigate to the Reports folder in the Documents folder, which contains only the latest saved copy of the Computer Recycling report.

2. In the Open group on the Home tab, click the History button. File History displays the total number of copies it saved of the files in this folder. See **Figure 10–7**. In this case, File History saved five versions: the most recent version and four earlier versions in the Reports folder.

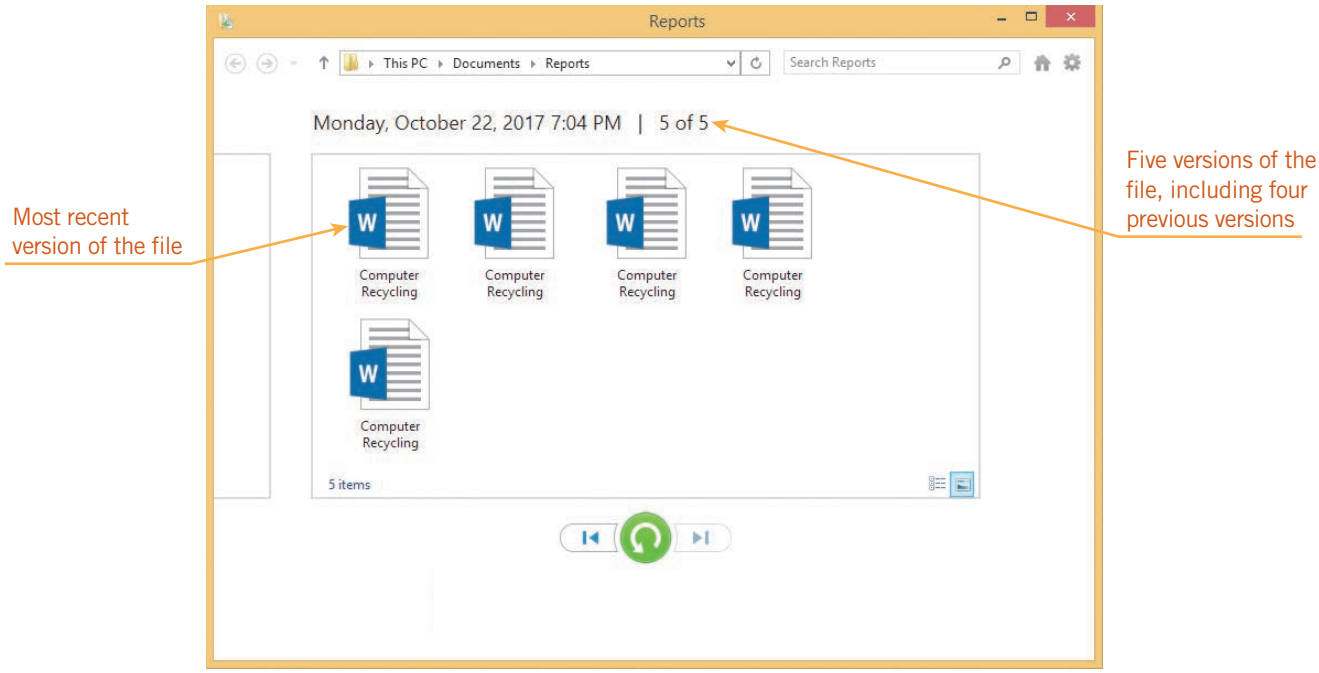


FIGURE 10–7 Accessing previous versions of a file

3. To access the previous versions, double-click a Computer Recycling file.

4. Click the Previous version and Next version buttons at the bottom of the window until you find the version of the Computer Recycling file that contains a cover page. See **Figure 10–8**.

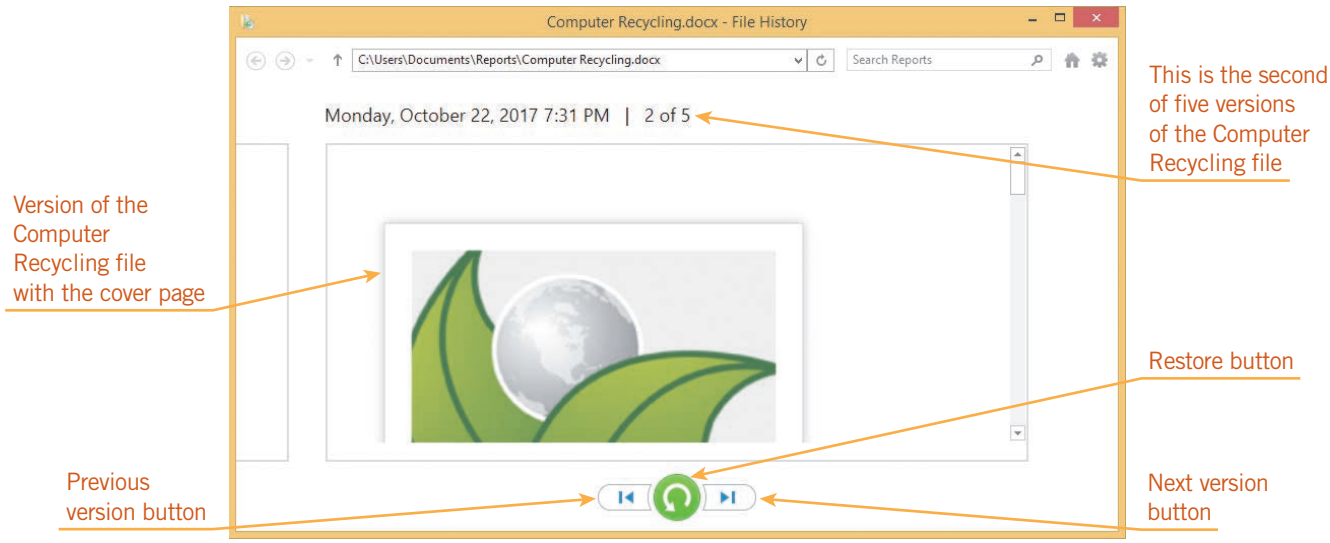


FIGURE 10–8 Displaying previous versions

5. Click the Restore button to restore the file.

File History lets you choose to replace the current file with the backup or to skip the replacement. If you want to save both the older version and the current one, you can move the current version to a different folder or rename it before restoring the older version.

You can also use the File History window to restore files, which is a better choice if you want to restore many files or folders. In the left pane of the File History window, click the Restore personal files link. Select the folders or files to restore, and then click the Restore button.

Using Online Backup Service Providers

VOCABULARY
online backup
remote backup

A popular alternative to installing and using backup software is subscribing to an online backup service, which automatically creates backups on a secure server. When you create a backup on a server, you are creating an ***online backup*** or a ***remote backup***.

To use an online backup service, you typically pay a fee to the service provider. This subscription fee varies depending on how often you want the service to create backups, how long you want to retain them, and how much storage space you want to reserve. The services let you set the same types of options you can set with backup software installed on your computer. For example, you can perform a full system, selective, incremental, or differential backup according to a schedule, such as once a day when you are not using your computer. After compressing the data into a single encrypted file, online backup services store the file on a server. To access the backup file, you must enter the correct username and password. Most online backup service providers validate the backups periodically, which means they check the backup files to make sure you can recover the data they contain.

Table 10–3 lists popular online backup service providers and lists their notable features.

TABLE 10–3 Popular online backup service providers

ONLINE BACKUP SERVICE	WEB ADDRESS	NOTES
Backblaze	www.backblaze.com	Backs up files on external drives as well as those on a hard drive
Carbonite	www.carbonite.com	In incremental backups, updates only modified parts of files to save time
CrashPlan	www.crashplan.com	Lets you create local and online backups
Mozy	www.mozy.com	Backs up open files as well as closed ones
SpiderOak	www.spideroak.com	Provides cloud storage and synchronizing as well as backup services

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In Step-by-Step 10.2, you visit the Carbonite Web site to learn how to use its services to back up and restore files. As you perform the steps, keep in mind that Web sites change frequently, so the pages you visit might look different from the ones shown in the figures.

Step-by-Step 10.2

1. Start Internet Explorer, and then go to **www.carbonite.com** to open the Carbonite home page. See **Figure 10–9**.

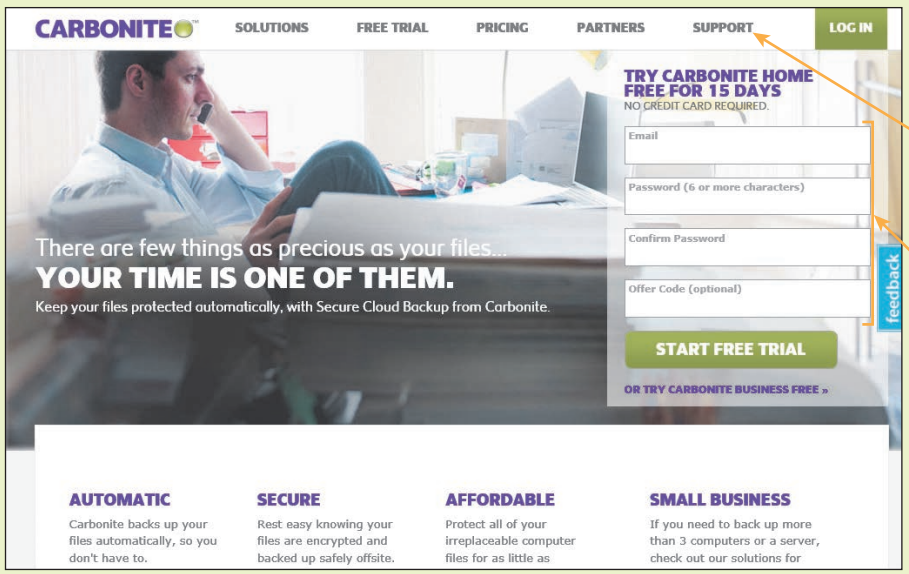
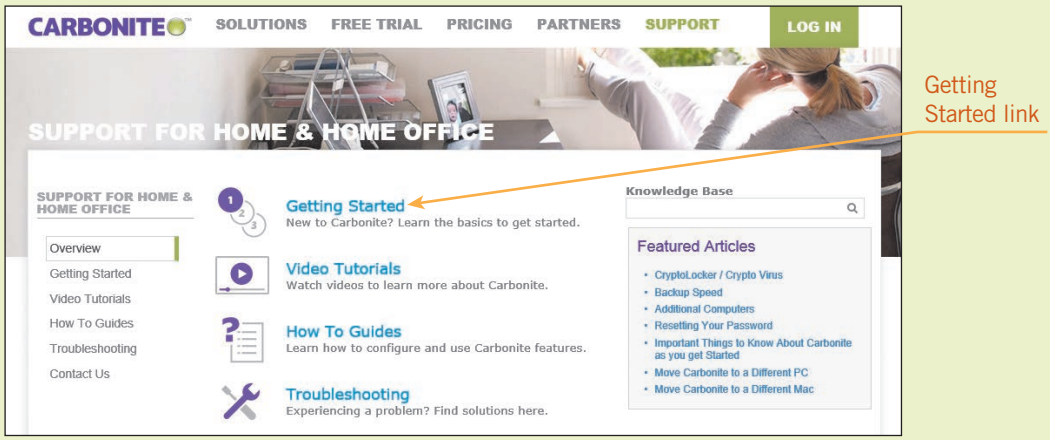


FIGURE 10–9
Carbonite home page

Courtesy of Carbonite

2. Point to the *Support* link on the navigation bar at the top of the page to display support options for home and business users, and then click the **Support for Home & Home Office Plans** link. A Web page opens displaying support options for home users. See **Figure 10–10**.

FIGURE 10–10
Support page for home and home office users



Courtesy of Carbonite

3. Click the **Getting Started** link to display the Getting Started with Carbonite Web page.
4. Scroll to the bottom of the page, and then click the **Part 2: Choosing Your Backup Selections** link. Read the information to learn about the options for selecting files to back up, scheduling the backup, and encrypting the backup file.
5. Click the **Part 3: Selecting Files for Back up** link, and then read the information to learn how you can select individual files to back up.
6. Click the **Part 4: Telling What is Backed Up** link, and then read the information to learn how you can identify files and folders that are scheduled for backup or have already been backed up.
7. Click the **Part 7: Restoring Files** link, and then read the information to learn how to restore files from an online backup.
8. Close Internet Explorer.

Should you use backup software to create local backups or use online backup services to create online backups? Recall that experienced computer users often use both methods because each has advantages and disadvantages. To create a local backup, you need backup software and removable media with enough capacity to hold your backup files. As long as you store the media in a secure place, you always have access to the files. If they are not in a secure location, however, they are vulnerable to theft and damage. Online backups are stored on a secure server, so you don't need to purchase removable media, but you do pay a fee to use the online backup service. You must also depend on the backup service to stay in business and protect against hackers so you can access your files.

Synchronizing Files

Recall from Lesson 4 that cloud computing provides online software and services for you to use to create and store files online. You can use software and online services to ***synchronize*** your files stored in the cloud with the version of those files stored on your computer's hard drive by comparing files on the two drives, and then updating files as necessary so the drives contain the same versions of the files. Some cloud storage services such as Dropbox synchronize more than one computer with the files you store in a cloud folder. For example, suppose you work on a project on your home computer, and then save the project files in your cloud folder. You use a school computer to download the files and continue working on the project, and then save the updated project files in your cloud folder. Now the files in the cloud folder contain more recent data than the files on your home computer. When you arrive at home and connect to the Internet, the cloud storage service provider synchronizes the files so that you have the most recent versions on your home computer.

Although synchronizing is a convenient way to keep copies of files in various locations up to date, it is not the same as backing up files, and is not recommended as an alternative to creating backups. You can perform both actions—synchronizing and backing up—on the same files, though you do so for different reasons. If you want to use files in two locations, such as a laptop and a handheld device, you synchronize the files. For example, you synchronize the music files on a laptop and portable music player so you can listen to the same music on either device. On the other hand, you back up files when you want to store a copy of the files as a safeguard in case something goes wrong. You usually access the backup files only if you need to restore them to their original location.

VOCABULARY

synchronize

ABOVE AND BEYOND

Online backup services such as Carbonite and Mozy are different from cloud storage services such as SkyDrive and Google Drive. An online backup service automatically backs up data to compressed and encrypted backup files on a secure server and provides tools for restoring the data to your computer. A cloud storage service provides a certain amount of space on a secure server where you can keep files.



ETHICS IN TECHNOLOGY

Ethical Questions for Cloud Storage

Storing backups and other data in the cloud is easy and convenient, especially if you use more than one computer. However, when you share your data with a cloud service provider, you need to consider how much control they have over the data. For example, suppose you store backups of your financial records in the cloud. To access the cloud folder, you pay a monthly fee for a two-year subscription. Suppose after your subscription runs out, the IRS wants to examine your financial records for the last five years. The only copy you have of the oldest data is in your cloud folder. In this case, you probably hope that the cloud service provider has retained your financial data after your subscription ends. However, is it right that the cloud service provider is holding onto your data even when you are no longer using the service? The ethical and legal question is who owns the rights to the digital property stored in the cloud? The answer is being worked out by users, cloud service providers, and legal professionals.

Following a Backup Plan

VOCABULARY
backup plan
redundancy

A ***backup plan*** follows a regular schedule for creating different types of backups. The ideal plan uses more than one backup method to take advantage of their benefits, provides for storing on-site and off-site backups, and includes ***redundancy***, which means you create more than one copy of a backup, so that at least one backup survives a destructive event. To do so, you can follow what some experts call the Backup 3-2-1 rule:

- *3 backups*—Maintain two full system backups, one labeled Backup A and the other labeled Backup B. Each week, create an incremental or differential backup, the first week using Backup A and the next week using Backup B. Rotating backups keeps your data secure without requiring you to purchase lots of backup media. The third backup to create is a selective backup of important files you modify, either at the end of the day or more frequently.
- *2 types of media*—In case a drive or port fails, create the full system backups on two types of media, such as an external hard drive and DVDs or a cloud folder.
- *1 off-site backup*—Store one of the full system backups off-site and store the other in a safe place in your home or office. When you create an incremental or differential backup each week, swap the on-site copy with the off-site copy. In this scheme, you always store the most recent full system backup off-site.

Protecting Hardware

Backups are the best protection for digital data, and software tools such as antivirus software are designed to protect your operating system and other files. You also need to consider protecting your hardware—the computer and its peripherals—from theft and physical harm. Protecting computer data, software, and hardware is part of your responsibility as a computer owner.

ABOVE AND BEYOND

In addition to a backup plan, businesses often create a disaster recovery plan, a set of written guidelines that specifies how to restore a computer in case a disaster such as a hurricane or flood, a technical problem, such as a computer failure, or a catastrophe created by a person, such as a virus or theft. A disaster recovery plan should indicate how to return to normal operations, such as where to acquire replacement computers, where backup files are stored, and how to restore them. Individual computer users can create such a plan too, especially if they depend on their computer for work or essential services.

Protecting Against Environmental Damage

Computers and peripheral devices can be harmed by environmental hazards, including temperature extremes, humidity, electrical fields, and power fluctuations. Apply the following guidelines to protect your computer against environmental hazards in the places where you use the computer:

- *Temperature*—Computer components work best in a temperature range of 68 to 75 degrees (F). If the temperature in a room exceeds 85 degrees, internal computer components can overheat, which can make a computer unstable. Set the heating and cooling system to maintain a temperature in the optimal range for computers.
- *Humidity*—High humidity can damage internal computer components. If water vapor penetrates a system unit, it can collect and eventually cause a short circuit, which could destroy electronic components. Extreme dryness can also cause problems, especially those related to static electricity. A static charge to an open system unit can zap an entire motherboard. Take precautions to keep the humidity between 30 and 50 percent.

- *Water and other liquids*—Water or other liquids in the system unit or any other hardware receiving power can cause a short circuit, which is why you should not keep beverages near your computer. If a computer is turned off and water seeps into the system, such as during a flood, you have a good chance of salvaging the computer by taking it to a repair professional who can open the case and dry everything before restoring power.
- *Physical damage*—Current mobile computers are designed to withstand shock from moderate drops and bumps. (A desktop computer has less shock-absorbing material.) The most likely component to be affected by physical jarring is the hard drive, and recovering a hard drive is time consuming even if you have a full system backup. Transport mobile computers with care, such as in padded cases.

  Display screens, especially on smartphones and tablets, can also be cracked from physical impact. See **Figure 10–11**. Even minor damage to a touchscreen means the screen needs to be replaced, though it is often more expensive to repair the screen than to buy a new device.



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FIGURE 10–11 Protect computers from physical damage

- *Power fluctuations*—Lesson 9 described the hazards of power surges and power failures. To protect against fluctuations in power, you can plug a computer into a surge protector (also called a surge suppressor) when the computer is running on power from a wall outlet. A surge suppressor traps short, fast bursts of power before it can harm a computer. To protect against loss of power to a desktop computer or a recharging mobile computer, you can use an ***uninterruptible power supply (UPS)***, which contains a battery that provides power if the normal current is interrupted. As with a surge protector, you plug a computer's power cord or a power adapter cord into the UPS and plug the UPS into a power outlet. **Figure 10–12** shows a surge protector and a UPS.

VOCABULARY
uninterruptible power supply (UPS)



Surge protector UPS

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FIGURE 10–12 Surge protector and uninterruptible power supply (UPS)

Protecting Against Theft

Because computer equipment and the data stored on it are valuable, they are vulnerable to theft. Basic precautions such as locking doors, especially to rooms containing computers, can be a deterrent. You can also use a cable lock to secure a mobile computer to a desk or table, as shown in **Figure 10–13**, or attach an alarm that sounds when a computer or drive is unplugged.



© iStockphoto/fotoscape

FIGURE 10–13 Laptop secured with a cable lock

Installing tracking software increases the chances of recovering a stolen computer. You can trigger the tracking software remotely so it sends its location and identifying information to another specified computer. For example, Apple provides tracking software for its mobile computers; the one for the iPhone is called Find My iPhone. If the iPhone is turned on and connected to the Internet, you can use another computer to track the location of the iPhone using GPS technology. If you've lost your iPhone, you can use Find My iPhone to beep and display a phone number where you can be reached along with a message such as "This iPhone has been lost. Please call me." Find My iPhone also locks the device so no one can access your data. Other features to look for in computer tracking software include the following:

- *Alarm*—An alarm feature repeatedly plays an urgent sound to help you locate a device or to alert others that an unauthorized person has your device.
- *Data removal*—Besides locking the device, this feature lets you erase your data remotely. This option is the most useful if you have backed up your data first.
- *Unauthorized user notification*—If your computer includes a camera, this feature lets you set the camera to take a photo of anyone who enters an incorrect password three times. You can also have the computer send you an e-mail message displaying the photo and location of the unauthorized user.
- *Battery control*—After using GPS to find a lost mobile device, you can use the battery control feature to turn off GPS to conserve battery power.

SUMMARY



In this lesson, you learned:

- A backup is a duplicate copy of a file that you use if the original file is lost, damaged, or destroyed. To use a backup copy of a file, you first need to restore it, which means to copy the file to its original location on your computer.
- The four most common types of backups for individual computer users are full system backups, differential backups, incremental backups, and selective backups. Each of these types has advantages and disadvantages.
- A full system backup (also called a system image or a disk mirror) is an exact duplication of the hard drive, including data files, system files and settings, application files, and the operating system.
- A differential backup contains copies of the files that have changed since the last full system backup, while an incremental backup contains copies of the files that have changed since the last full system backup or the last incremental backup.
- When you perform a selective backup, you select the folders and files you want to back up.
- To create a backup, you can use backup software installed on your computer, or you can use an online backup service provider.
- Backup software is a set of system utilities for creating and updating backups and for restoring files from a backup. Operating systems, third-party software developers, and manufacturers of backup media provide backup software. Backup software compresses all the files selected for a backup into a single large file, and stores an index of file details, including their original locations, to restore the files.
- After installing backup software, you set a schedule and select a location for the backups. The backup software follows the schedule to create backups in the background. Backup locations typically include an external hard drive, USB flash drive, optical disc, or network folder.
- Backup software features include backup type options, encryption, media spanning, and data verification.
- An online backup service automatically creates backups on a secure server. When you create a backup on a server, you are creating an online backup or a remote backup.
- To use an online backup service, you typically pay a fee to the service provider, and then set the same types of options you can set with backup software installed on your computer.

- You can use software and online services to synchronize your files stored in the cloud with the version of those files stored on your computer's hard drive by comparing files on the two drives, and then updating files as necessary so the drives contain the same versions of the files. Synchronizing is not the same as backing up files, and is not recommended as an alternative to creating backups.
- A backup plan follows a regular schedule for creating different types of backups. The ideal plan uses more than one backup method, provides for storing on-site and off-site backups, and includes redundancy. An example of a backup plan is one that follows the Backup 3-2-1 rule: 3 backups, 2 types of media, and 1 off-site location.
- Computers and peripheral devices can be harmed by environmental hazards, including temperature extremes, humidity, electrical fields, and power fluctuations. You need to take precautions to prevent damage from these environmental factors.
- To protect computer hardware from theft, you can use locks, alarms, and computer tracking software.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. A full system backup is the same as an incremental backup.

T F 2. Online backups are stored on a secure server, so you don't need to purchase removable media to create the backups.

T F 3. The ideal backup plan prevents redundancy.

T F 4. Backup software can usually encrypt the files in a backup so that only authorized people can access them.

T F 5. To protect against loss of power to a desktop or mobile computer, you can use an uninterruptible power supply (UPS).

MULTIPLE CHOICE

Select the best response for the following statements.

1. A _____ is an exact duplication of the hard drive, including data files, system files and settings, application files, and the operating system.
   A. full online backup
   B. selective backup
   C. fully synchronized system
   D. full system backup
2. When you store a backup on an external hard drive attached to your computer, you are creating a(n) _____.
   A. removable backup
   B. local backup
   C. online backup
   D. external backup
3. To use a backup copy of a file, you first need to _____ it, which means to copy the file to its original location on your computer.
   A. recover
   B. restore
   C. repair
   D. reinstate
4. The backup software provided with Mac OS X is called _____.
   A. File History
   B. Carbonite
   C. Time Machine
   D. Backup and Restore
5. If you _____ a backup, only authorized people can access the data it contains.
   A. encrypt
   B. synchronize
   C. compress
   D. validate

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What two major decisions do you need to make before creating backups?

2. What is the difference between a full system backup and a selective backup?

3. Which medium do experienced computer users prefer for creating local backups and why?

4. What is an online backup?

5. Why should you store some backup copies in an off-site location?

6. Describe the advantages and disadvantages of online backups.

7. What is a backup plan?

8. What is the difference between a differential backup and an incremental backup?

9. How can extremes in humidity harm a computer?

10. What is the purpose of computer tracking software? How does it work?

PROJECTS

PROJECT 10–1

In this project, you explore the File History settings available from the PC settings screen. You need a USB flash drive to perform the steps in this project. You take screenshots as you perform the steps. See Project 3–1 if you need a refresher on how to take screenshots. Submit the screenshots as your instructor requests.

1. Insert a USB flash drive into a USB port on your computer.
2. Display the Charms bar, click the **Settings** charm, and then click **Change PC settings**.
3. In the left pane of the PC setting screen, click **Update and recovery**.
4. In the left pane of the Update and recovery screen, click **File History**. Note the settings so you can restore them, if necessary.
5. Click the **Select a different drive** link. When Windows displays a list of removable drives connected to your computer, select the USB flash drive you inserted in Step 1.
6. Drag the **File History** slider to turn it on, if necessary.
7. Press the **Print Screen** key to capture an image of the screen. Save the image as a Paint file named **File History On**.
8. Drag the **File History** slider to turn it off.
9. Press the **Print Screen** key to capture an image of the screen. Save the image as a Paint file named **File History Off**.
10. Restore the original File History settings if they are different from the current settings. You might need to turn File History off and select a different drive.
11. Close the PC settings screen, and then remove your USB flash drive.

PROJECT 10–2

In this project, you explore the options in Time Machine, the file synchronization tool for Mac OS X, and then answer questions. Some steps require you to perform new tasks or solve problems independently. Submit the written answers as your instructor requests.

1. Use your browser to go to **support.apple.com**.
2. Use the Search feature to find information about Time Machine.
3. Click links in the search results to find answers to the following questions:
   a. How do you tell Mac OS X Mavericks to use Time Machine to back up your files?
   b. What precautions should you take during the first Time Machine backup?
   c. After the first backup, how does Time Machine back up files?
   d. How long does Time Machine keep hourly backups, daily backups, and weekly backups?
   e. How do you use Time Machine to restore a file?
4. Close all open windows.

PROJECT 10–3

In this project, you explore the options provided by an online backup service, and then answer questions. Submit the written answers as your instructor requests.

1. Use your browser to go to **www.crashplan.com**.
2. Scroll the CrashPlan home page and use tools the Web site provides to find answers to the following questions:
   a. With what operating systems can you use CrashPlan?
   b. What types of backups does CrashPlan offer free of charge?
   c. What additional services do you receive with a paid subscription?
   d. Does CrashPlan offer differential or incremental backups?
   e. If you download CrashPlan Pro, what happens to your data after the trial period or subscription ends?
3. Close all open windows.

TEAMWORK PROJECT

You work for a small law office that connects its computers on a network. Everyone at the law office needs to back up files frequently. Your manager asks you and another employee to propose a backup plan for the office. Work with a partner to complete the following steps.

1. One partner should research backup methods and the other partner should research backup plans used by other small law offices.
2. Work as partners to create a backup plan for the law firm. Indicate the following information:
   a. Types of backups to create
   b. Methods to use to create the backups
   c. How often to create the backups
   d. Where to store the backups
3. Submit the backup plan as your instructor requests.

CRITICAL THINKING

CRITICAL THINKING 10–1

Although computer experts agree that backing up is the best way to protect your data, a minority of computer users follow their advice. Complete the following.

1. Visit at least two Web sites to research the percentage of computer owners that back up their data.
2. How many users back up their data daily? How many back up monthly? How many do not back up at all?
3. Why do you think some computer owners back up at least once a day?
4. What do you think can be done to encourage computer owners to back up regularly?
5. Submit your findings as your instructor requests.

CRITICAL THINKING 10–2

As you learned in this lesson, computer tracking software uses GPS technology to find lost or stolen computers. However, GPS technology can also introduce security concerns. Learn more about this issue by researching online. Complete the following.

1. Visit at least two Web sites to find information about GPS tracking on smartphones and tablets. Answer the following questions:
   - How do most smartphones and tablets use GPS technology?
   - What are the risks of using GPS tracking?
   - Considering the risks, what guidelines will you follow when using the GPS feature on a smartphone or tablet?
2. Submit your responses as your instructor requests.

ONLINE DISCOVERY

ONLINE DISCOVERY 10–1

Research backup options for an Android smartphone, and then answer the following questions. Submit the written answers as your instructor requests.

1. What are two popular Android backup apps you can use free of charge?
2. Select an Android backup app, and then list three features that appeal to you.
3. How can you back up an Android smartphone to a Windows computer and to a Mac?

ONLINE DISCOVERY 10–2

In this lesson, you explored the backup software provided with Windows and learned about third-party backup software you can install on your computer. Research how to use one of the third-party backup applications, and then answer the following questions. Submit the written answers as your instructor requests.

1. Choose one of the following backup applications and then research their features for home users online:
   - Acronis True Image
   - Backup Maker
   - Cobian Backup
   - Genie Backup Manager
2. Explain how to use the backup software you selected to create a full system backup.
3. Explain how to use the backup software to restore files from a backup.

JOB SKILLS

As you've learned throughout Module 1, technology changes rapidly. Not too long ago, online backup services were not affordable for most users, so they had to create backups only on removable media or in network folders. Technology will continue to change throughout your career. You can enhance your value as a job candidate or employee by staying informed about changes and advancements in technology. Complete the following steps.

1. Brainstorm how you can keep up with technology changes.
2. Use online resources to research five ways to learn about technology innovations and trends.
3. List the five ways you researched, and briefly explain each one.
4. Submit your findings to your instructor as requested.

EXPLORE AND SOLVE

Did you know?

- Windows includes a tool called Storage Spaces.
- You can use Storage Spaces to save files to two or more drives to protect you from a hard drive failure.

1. Open Windows Help and Support, and then search for *Storage Spaces*. Use Help and Support and the Microsoft Web site to answer the following questions:
   a. What do you use Storage Spaces to create?
   b. What is a storage pool?
   c. What is the advantage of using Storage Spaces?
   d. What do you need to use Storage Spaces?
   e. How do you create a storage space?
2. Submit your answers to your instructor as requested.



Estimated Time:
2.5 hours

Computing Fundamentals

IC³ Pretest

REVIEW QUESTIONS

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. A graphical user interface requires you to type text commands to interact with the computer.

T F 2. If a computer has a multicore processor, the operating system can use multiprocessing to split tasks among the processors.

T F 3. On a Windows computer, the best place to store your data files is in the root directory of the hard drive.

T F 4. At high resolutions, a screen displays more information than at low resolutions, so text and objects are smaller and sharper.

T F 5. An example of an embedded computer in a car is one that senses when your car moves out of its lane.

T F 6. Anyone can use, modify, and distribute open-source software.

T F 7. An app that is specifically designed for a handheld computer, such as a tablet or smartphone, is called a handheld app.

T F 8. File History and Time Machine are examples of backup software that make incremental backups of files and keep copies of each saved version of a file.

T F 9. An inkjet printer is a nonimpact printer that produces text and images using the same technology as copier machines.

T F 10. A blank or corrupted display screen is often a symptom of a damaged video card.

T F 11. Magnifier is an example of an accessibility tool in Windows 8.

T F 12. Computers are binary machines, which means that they understand only two states—on and off, represented by 0 and 1.

T F 13. An error during shut down usually means a critical system component is damaged or failing.

T F 14. A static charge to an open system unit can damage the motherboard.

T F 15. A hard drive is a storage device, while a hard disk is a type of storage media.

MULTIPLE CHOICE

Select the best response for the following statements.

1. The input and output devices connected to the computer are called _____.
   A. platforms
   B. peripherals
   C. utilities
   D. networks
2. The speed of a CPU is measured in _____.
   A. gigabytes
   B. pixels per inch
   C. gigahertz
   D. bytes per second
3. To move, copy, and rename files and folders in Windows, you use _____.
   A. Task Manager
   B. File Explorer
   C. Internet Explorer
   D. Control Panel
4. To access the Report.docx file in the (E:) ▶ Courses ▶ Communications ▶ Assignments ▶ Report.docx file path, the last folder you open is the _____ folder.
   A. Assignments
   B. Communications
   C. Courses
   D. Report
5. A(n) _____ operating system is included in the hardware of a standalone device to meet a specific purpose and perform a single type of task.
   A. personal
   B. mobile
   C. server
   D. embedded
6. The _____ is a series of steps the operating system must complete before you can interact with the operating system.
   A. instruction cycle
   B. data transfer process
   C. information processing cycle
   D. boot process
7. In Windows, you can change the background color of the Start screen by using the _____.
   A. Personalize menu
   B. Appearance and Personalization window
   C. Start Screen window
   D. PC and devices category of the PC settings screen
8. Of the following system components, the _____ has the most significant effect on a computer's performance and computing power.
   A. CPU
   B. memory module
   C. motherboard
   D. ROM chip
9. In the _____ power state, Windows conserves power by saving your data and system settings in temporary memory, blanking the screen, and ceasing to perform any activities.
   A. high-performance
   B. shut down
   C. sleep
   D. basic
10. Of the following, a _____ represents the most amount of data.
    A. kilobyte
    B. gigabyte
    C. terabyte
    D. megabyte
11. Most laptop computers include a _____ so you can use the computer without attaching a mouse.
    A. touchpad
    B. trackball
    C. digital pen
    D. stylus

12. Which of the following computing devices typically includes a built-in camera, music player, and global positioning system (GPS), and lets you send and receive phone calls, e-mail messages, and text messages?

    A. server
    B. smartphone
    C. portable media player
    D. e-book reader

13. When you purchase software, you are actually purchasing a(n) _____, which is a legal agreement that specifies how you can install and use the software.

    A. copyright
    B. update right
    C. activation code
    D. software license

14. Which of the following types of software do you use to reduce the size of a file by removing redundant data?

    A. file compression
    B. photo editing
    C. disk management
    D. database

15. _____ involves the following four steps: define the problem, identify possible causes, determine the most likely cause, and apply solutions.

    A. Using a knowledge base
    B. Troubleshooting
    C. Disaster recovery
    D. Using a backup plan

FILL IN THE BLANKS

Complete the following sentences by writing the correct word or words in the blanks provided.

1. _____ is called volatile memory because it loses its contents when you turn off the power to the computer.
2. The _____ is the case that contains a computer's main system components.
3. _____ consists of instructions, or programs, for controlling a computer so it performs tasks.
4. When you delete a folder from the hard drive on a Windows computer, the folder and all of its files are stored in the _____.
5. In an operating system, a(n) _____ is a collection of information that indicates the files and folders you can access, the types of changes you can make to the computer, and your preferred appearance settings.
6. To connect a peripheral device to a computer, you use a(n) _____ located on the system case.
7. _____ tablets use a hybrid design that includes a swivel screen or removable keyboard so you can use the computer as a laptop or tablet.
8. To install software, you use a(n) _____ program, which guides you through the installation steps and prepares the software so you can use it on your computer.
9. In Windows, you can use _____ to undo system changes without affecting your data files.
10. A(n) _____ is a type of hard drive that uses flash memory technology to store data as electrical charges.
11. A(n) _____ is software that coordinates the resources and activities on a computer.
12. _____ technology can identify people based on their fingerprints, face, handwriting, or voice.
13. Typical tasks for a(n) _____ computer include processing payroll and billing operations for a large corporation and handling millions of credit card transactions for a bank.
14. Starting in _____ and then restarting the computer often resolves a computer startup problem.
15. A(n) _____ is a duplicate copy of a file that you use if the original file is lost, damaged, or destroyed.

PROJECTS

PROJECT 1–1

You are ready to buy a new computer and have a budget of $700 to spend on the computer, software, and accessories. Using online resources to research new computers, create a written report that explains your decision and answers the following questions. Submit the report as your instructor requests.

1. Computer usage—What types of tasks will you perform on the new computer? How often do you plan to use the new computer?
2. Computer type—Which computer type did you select: traditional desktop, all-in-one desktop, laptop, tablet, or smartphone? Why did you select that type of computer? Which Web site did you use to research the computer? What is the total cost of the computer, not including additional software and accessories?
3. System components—What are the brands and specifications of the system components you selected, including the processor, RAM, and hard drive? Why did you select these components? Did you upgrade any components? If so, which ones and why?
4. Other hardware—What are the specifications of the other hardware you selected, including the display, graphics or video card, network card, pointing device, ports, microphone, speakers, and camera? Why did you select this hardware?
5. Additional hardware factors—What additional hardware influenced your decision? Examples include size and weight of the computer, swivel screen, touchscreen, battery life, and special sound system.
6. Operating system—Which operating system runs on the new computer? Why did you select a computer that runs this operating system?
7. Software—Does the computer include preinstalled software that you will find useful? If so, identify this software. What additional software do you need to purchase to fit your computer usage? What is the total cost of the additional software?
8. Accessories—What accessories do you need for this computer? What is the total cost of the accessories?
9. Total cost—What is the total cost of the system, including computer, additional software, and accessories?

PROJECT 1–2

You purchased a new Windows computer and now want to customize it to fit your needs and preferences. Create a presentation that shows how to customize the following elements in Windows, and explains why you selected each option or preference. Be sure to include at least one screenshot on each slide to illustrate the steps you performed or the results of your selections. Submit the presentation as your instructor requests.

1. Change the Start screen background. Why did you select the design and color scheme you selected?
2. Change the desktop theme, and then customize the color, sounds, or screen saver in that theme. Why did you customize the element you selected?
3. Add a desktop icon to the desktop, and then change the appearance of the icon. Why did you add that icon to the desktop?
4. Change a date, time, language, or region setting to localize your new computer. Which setting did you change?
5. Turn on an accessibility setting that you find useful. Which setting did you select?
6. Change the power settings to suit your computer usage. Which settings did you change?
7. When you turned on the computer for the first time, one of your first tasks was to create a user account. What type of account did you create? Did you enter a password to use for the account?
8. Considering the types of tasks you will perform on the new computer, create folders for the files you'll create when you perform these tasks. What folders did you create and why?
9. If you have already created or saved files on the computer, move them to the appropriate folders. How do you plan to maintain your file and folder organization?

PROJECT 1–3

You have been using your new computer for about a month and want to keep it running at top performance. Create a maintenance plan by providing the information requested in the following items.

1. Hard drive
   - Explain how to best use the storage capacity of your hard drive and keep it free of unnecessary files.
   - Describe the software tools you will use to maintain the hard drive.
2. Other hardware
   - Explain how to conserve power.
   - Describe how to decrease the requests for processing power and RAM if the computer is slow to respond to commands.
   - Explain how to physically protect the computer.
3. Operating system
   - Describe how you will end each Windows session.
   - Explain how to keep the operating system secure.

SIMULATION

Scenario:

You have been working for a small company named Culture XChange that coordinates exchanges between the United States and other countries. Some of the exchanges are for high school and college students to learn about new cultures and practice language skills. Other exchanges are for volunteers to work with local community groups. As a project assistant, you provide support to team leaders by producing and distributing promotional material, finding placements for customers, surveying customers, and making sure the office runs smoothly. The company provides Windows laptops to each of its 25 employees.

JOB 1–1

Team leaders at Culture XChange often use graphics software to create and modify illustrations for print and online material, enhance photos, and add special effects to graphics. Right now, team leaders use the graphics-editing features in Microsoft PowerPoint to perform these tasks, but they want to install new software that is dedicated to graphics editing, with an emphasis on photo editing. They also want to produce videos that animate photos and other images, so they are especially interested in animation features.

1. Research graphics-editing software or image-editing software, and list five popular applications in a written document.
2. Select an application you researched, and then search online for a free demo, tour, or tutorial that shows the basic features of the application.
3. Search for another free demo, tour, or tutorial that shows how to perform a common task using the application.
4. If necessary, search for other online content that explains or demonstrates other features in the application, including animation.
5. Would you recommend the application you selected to the team leaders at Culture XChange? Explain why or why not in the written document.
6. Submit the document as your instructor requests.

JOB 1–2

As a project assistant, team leaders and other Culture XChange employees often ask you to help them troubleshoot hardware and software problems. In a written document, explain how you would troubleshoot the following problems.

1. An employee named Brianna uses a computer that lost its wireless connection to the Internet a few minutes ago. Brianna has not been able to reconnect to the Internet.
2. An employee named Jason wants to use a headset that includes a microphone and earphone so he can listen to videos and provide speech commands to the computer. The headset has a USB plug for attaching the device to the computer. However, when Jason plugs the headset into a USB port, it does not transmit sound through the microphone or earphone.
3. When an employee named Maya started her computer, it displayed a blank screen for several seconds, and then started in Safe mode. She shut down the computer, and then restarted it. Again, it started in Safe mode.
4. Submit the answers as your instructor requests.

JOB 1–3

A few Culture XChange teams are purchasing new laptops so they can run Windows 8. They ask you to research the best ways to dispose of their old computers. As long as you are researching computer disposal, the office manager also asks you about how to properly dispose of other equipment.

1. What options are available in your community for discarding the following types of computer equipment?
   - LCD computer monitor
   - Cell phones that no longer work
   - Laptop batteries
   - Toner and ink jet cartridges
   - CDs, DVDs, and their hard plastic cases
2. What regional or national resources can you use to discard the following types of computer equipment? Describe how to provide equipment to a typical organization.
   - Working but out-of-date laptops
   - Printers
   - System components such as expansion boards
3. Submit your findings as your instructor requests.

JOB 1–4

Culture XChange wants to expand its offerings to provide more travel services, such as on-site lectures and classes, home stays for travelers, and guided tours of sites and destinations. Your manager asks you to provide ideas for using computer hardware and software in the new Travel Services department. Some members of the department will work at their U.S. office, while others will travel to locations around the world.

The U.S. staff will be responsible for scheduling events, maintaining budgets, and enrolling customers. The traveling staff will be responsible for researching destination information and navigation locations, keeping in touch with colleagues and customers, playing informational videos for customers, and taking care of practical details such as accommodations, dining options, and personal safety.

1. Consider the types of computers, peripheral devices, and software the U.S. office staff will need and the types of computers, peripheral devices, and software the traveling staff will need. Research your ideas as necessary.
2. Create a table similar to the following, and then enter your recommendations for each item. Below the table, explain your choices.

	U.S. Staff	Traveling Staff
Computers		
Peripheral Devices		
Software		

3. Submit the table and explanations as your instructor requests.

JOB 1–5

Culture XChange does not have a specific policy that outlines when and how employees should back up their data. One consideration is that the company wants to minimize the amount of storage space the backups require. Your manager asks you to provide the following information about creating backups so she can create a policy for employees.

1. What types of backups should be performed for each employee? Why should these types of backups be performed?
2. How often should each type of backup be performed?
3. What backup method do you recommend and why? Do you recommend any additional backup methods?
4. Submit the answers as your instructor requests.



Estimated Time for Module: 23.5 hours

MODULE 2

KEY APPLICATIONS

LESSON 11 **1.5 HRS.**
Exploring Microsoft Office 2013

Word Processing

LESSON 12 **1.5 HRS.**
Getting Started with Word Essentials

LESSON 13 **2 HRS.**
Editing and Formatting Documents

LESSON 14 **2 HRS.**
Sharing Documents

LESSON 15 **1.5 HRS.**
Working with Tables

LESSON 16 **1.5 HRS.**
Enhancing Documents

LESSON 17 **1.5 HRS.**
Working with Graphics

Spreadsheets

LESSON 18 **1.5 HRS.**
Getting Started with Excel Essentials

LESSON 19 **1.5 HRS.**
Organizing and Enhancing Worksheets

LESSON 20 **2 HRS.**
Creating Formulas and Charting Data

Presentations

LESSON 21 **1.5 HRS.**
Getting Started with PowerPoint Essentials

LESSON 22 **2 HRS.**
Enhancing Presentations with Multimedia Effects

Databases

LESSON 23 **2 HRS.**
Getting Started with Access Essentials

LESSON 24 **1.5 HRS.**
Managing and Reporting Database Information

KEY APPLICATIONS

LESSON 11
Exploring Microsoft Office 2013

2-1.1.1	2-1.1.7	2-1.3.1	2-1.3.3	2-1.3.5
2-1.1.6	2-1.1.8	2-1.3.2	2-1.3.4	2-1.3.6

Word Processing

LESSON 12
Getting Started with Word Essentials

2-1.1.1	2-1.1.7	2-1.3.1	2-1.3.3	2-1.3.6
2-1.1.3	2-1.1.8	2-1.3.2	2-1.3.5	2-2.2.3

LESSON 13
Editing and Formatting Documents

2-1.1.2	2-1.1.5	2-1.2.1	2-2.1.2	2-2.2.3
2-1.1.3	2-1.1.6	2-1.2.2	2-2.2.1	
2-1.1.4	2-1.1.9	2-1.3.5	2-2.2.2	

LESSON 14
Sharing Documents

2-1.1.3	2-1.3.1	2-6.1.1	2-6.2.1
2-1.1.4	2-1.3.2	2-6.1.2	2-6.2.2
2-1.1.7	2-1.3.6	2-6.1.3	2-6.2.3

LESSON 15
Working with Tables

2-1.1.2	2-1.1.8	2-1.2.1	2-2.1.1	2-2.2.1
2-1.1.6	2-1.1.9	2-1.2.2	2-2.1.2	

LESSON 16
Enhancing Documents

2-1.1.7	2-1.2.1	2-1.3.3	2-1.3.6	2-2.2.1

LESSON 17
Working with Graphics

2-1.1.6	2-1.2.1	2-1.4.1	2-2.2.1
2-1.1.8	2-1.3.6	2-1.4.2	

Spreadsheets

LESSON 18
Getting Started with Excel Essentials

2-1.1.1	2-1.1.7	2-1.3.3	2-3.1.1
2-1.1.2	2-1.1.9	2-1.3.4	2-3.1.2
2-1.1.4	2-1.3.1	2-1.3.5	2-3.1.3
2-1.1.5	2-1.3.2	2-1.3.6	2-3.1.4

LESSON 19
Organizing and Enhancing Worksheets

2-1.1.2	2-1.3.1	2-3.1.4	2-6.1.1	2-6.2.3
2-1.1.3	2-1.3.2	2-3.1.5	2-6.1.2	
2-1.1.4	2-1.3.6	2-3.2.1	2-6.1.3	
2-1.2.1	2-3.1.2	2-3.2.3	2-6.2.1	
2-1.2.2	2-3.1.3	2-3.2.4	2-6.2.2	

LESSON 20
Creating Formulas and Charting Data

2-1.1.2	2-1.1.9	2-1.4.1	2-3.1.4	2-3.2.3
2-1.1.8	2-1.2.1	2-1.4.2	2-3.2.2	2-3.2.5

Presentations

LESSON 21
Getting Started with PowerPoint

2-1.1.1	2-1.1.6	2-1.2.2	2-1.3.4	2-4.2.1
2-1.1.2	2-1.1.8	2-1.3.1	2-1.3.6	2-4.2.2
2-1.1.3	2.1.1.9	2-1.3.2	2-1.4.1	2-4.2.3
2-1.1.5	2-1.2.1	2-1.3.3	2-4.1.1	2-4.3.1

LESSON 22
Enhancing Presentations with Multimedia Effects

2-1.1.4	2-1.3.5	2-4.1.2	2-4.3.2	2-6.1.3
2-1.1.7	2-1.4.1	2-4.1.3	2-4.3.3	2-6.2.1
2-1.2.1	2-1.4.2	2-4.1.4	2-6.1.1	2-6.2.2
2-1.2.2	2-4.1.1	2-4.1.5	2-6.1.2	2-6.2.3

Databases

LESSON 23
Getting Started with Access Essentials

2-1.1.2	2-1.1.6	2-1.1.9	2-1.3.2	2-1.3.5
2-1.1.3	2-1.1.7	2-1.2.1	2-1.3.3	2-1.3.6
2-1.1.5	2-1.1.8	2-1.3.1	2-1.3.4	2-5.1.3

LESSON 24
Managing and Reporting Database Information

2-1.1.1	2-1.2.1	2-1.3.6	2-5.1.3	2-6.2.2
2-1.1.4	2-1.2.2	2-1.4.1	2-6.1.1	2-6.2.3
2-1.1.5	2-1.3.1	2-1.4.2	2-6.1.2	
2-1.1.8	2-1.3.2	2-5.1.1	2-6.1.3	
2-1.1.9	2-1.3.5	2-5.1.2	2-6.2.1	



Estimated Time:
1.5 hours

LESSON 11

Exploring Microsoft Office 2013

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Start Microsoft Office 2013 applications.
- Switch between application windows.
- Close applications.
- Navigate and identify the common elements in application windows.
- Identify the elements in the new Office 2013 user interface.
- Customize the Quick Access Toolbar.
- Open, save, and close documents.
- Use online Help features.

DATA FILES

To complete this lesson, you will need these data files:

Recycled Automobiles.docx

3Rs.docx

Marketing (a folder containing Marketing Report.docx and Marketing Data.xlsx)

The 3Rs.pptx

Travel Expenses.xlsx

WORDS TO KNOW

application window
Backstage view
cursor
document window
file
file compatibility
file extension
folder
I-beam
insertion point
Jump List
minimized
open
path
Ribbon
save
ScreenTip
scroll
shortcut
shortcut menu
subfolders
template

Microsoft product screenshots used with permission from Microsoft Corporation.

Microsoft Office 2013 is an integrated software package that enables you to share information between several applications. The applications (also referred to as apps) available in Office are Word, PowerPoint, Excel, Access, Outlook, OneNote, Publisher, InfoPath, Lync, Project, SharePoint Workspace, and Visio. The applications available on your computer depend on which Office suite is installed and the options that were selected during the installation. Microsoft offers several different Office suites, such as Office Professional 2013, Office 365, and Office Home and Student 2013. Each suite offers a different combination of applications. Each Office application performs specific tasks. **Table 11–1** provides a brief description of the Office 2013 applications available.

TABLE 11–1 Microsoft Office 2013 applications

APPLICATION	DESCRIPTION
Access	A database application that enables you to organize, manipulate, and analyze information such as addresses and inventory data
Excel	A spreadsheet application that enables you to work with text, numbers, and formulas to create worksheets, tables, charts, and statistical analysis
OneNote	A digital notebook application that enables you to gather, manage, and search notes and information
Outlook	An e-mail and scheduling application that enables you to manage e-mail, contacts, appointments and events, and tasks efficiently
PowerPoint	A presentation application that enables you to create multimedia slide shows, outlines, organizational charts, handouts, and speaker's notes
Publisher	A desktop publishing application that enables you to develop a brand identity and design professional-looking marketing materials such as brochures, calendars, signs, and posters
Word	A word-processing application that enables you to create, edit, print, and share documents such as letters, memos, and reports

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Touchscreen Users

The instructions in this module generally provide directions for using a mouse to access commands and features. For example, the instructions may refer to actions such as *point, click, double-click*, or *right-click*. If you are using a touchscreen, you can use gestures such as *press, tap, slide, swipe*, and *drag* instead of following the directions for using the mouse.

Starting and Closing Applications

Starting applications, launching applications, and opening applications all have the same meaning. Closing applications and exiting applications also have the same meaning. Not only are the steps for starting and closing all Office applications the same, but the steps will also apply to most other applications, such as Internet Explorer 11 and Windows Media Player.

Starting Applications and Switching Between Applications

VOCABULARY
template

When you log on to a computer, the Start screen displays. You can start an application by selecting the application tile on the Start screen. When you select an application, you can choose to open an existing file or use a ***template*** to create a new file.

A template provides the basic structure and document settings such as text formats and page layout. An ***application window*** then opens and serves as the primary interface between the user and the application.

You can also open an application using the File Explorer. When you double-click a filename, the selected file automatically opens in the correct application. A ***shortcut***, which is often a button that sits on your desktop, is a pointer to an application or document file to the program. When you double-click the shortcut button, the application and/or the file opens.

Multiple applications can be open at the same time. A button for each open application appears on the taskbar at the bottom of the screen. To switch from one open application to another, click the application button on the taskbar. Buttons for commonly used applications, such as Internet Explorer and Windows Media Player, may also appear on the taskbar, even if they are not running. To rearrange the order of the buttons on the taskbar, you can drag and drop the application buttons to reposition them.

You can display the desktop without closing any of the applications by right-clicking the taskbar and then choosing a command in a ***shortcut menu***, a list of commonly performed commands from the current window. When you display the desktop, all the open applications are ***minimized***, which means the applications are still running, but the application windows no longer appear on the screen. However, the application button(s) still appear on the taskbar, and you can click those buttons to reopen the applications.

You can view multiple application windows at the same time by changing the layout of the windows on the screen. To access the different window layout options, right-click the taskbar and select an option from the shortcut menu.

VOCABULARY

application window

shortcut

shortcut menu

minimized

Step-by-Step 11.1

IC3
2-1.1.6
2-1.3.1
2-1.3.3
2-1.3.6

1. If you are already logged on and the desktop is displayed, you can use one of the following ways to open the Start screen, similar to the one shown in **Figure 11–1**. You may need to scroll through the screen to see the tiles for the Office applications.
   a. On a touchscreen, slide your finger inward from the right edge of the screen and then tap the **Start** button on the Charms bar menu.
   b. Click the **Start** button in the lower-left corner of the screen.
   c. On the keyboard, press the **Windows** logo key.

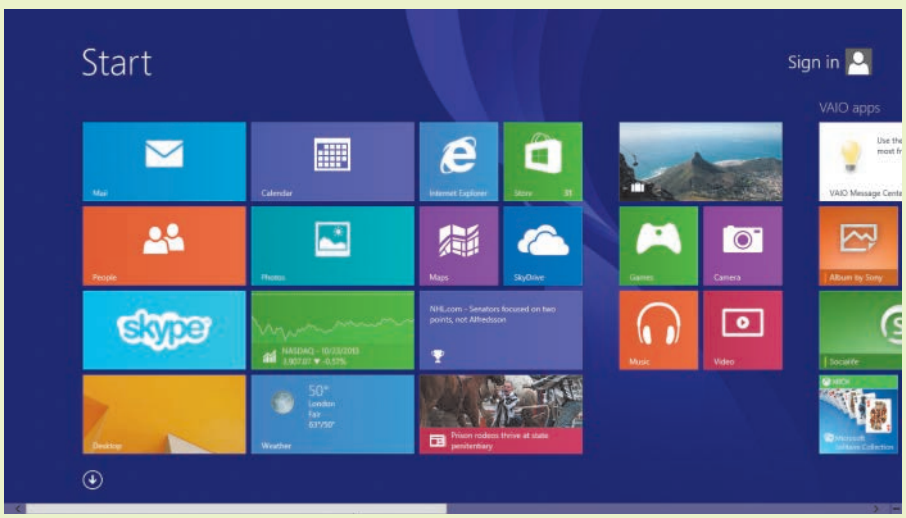


FIGURE 11–1
Windows 8 Start screen

QUICK TIP

If you are using Windows 7 or Vista, go to Step 2 and click the Start button to access the Start menu to open the Word 2013 application. Use the Start menu to start applications in all steps that follow.

QUICK TIP

To show a list of all the apps on your PC, click the arrow in the lower-left corner of the Start screen. Touchscreen users can simply swipe upward.

2. If necessary, scroll through the Start screen tiles and select the **Word 2013** application tile. The opening screen appears as shown in **Figure 11–2**. Recently accessed documents appear in the pane on the left, and templates for creating new documents appear in the template gallery on the right. The templates available in your template gallery may differ. You will learn more about using these templates in Lesson 16.

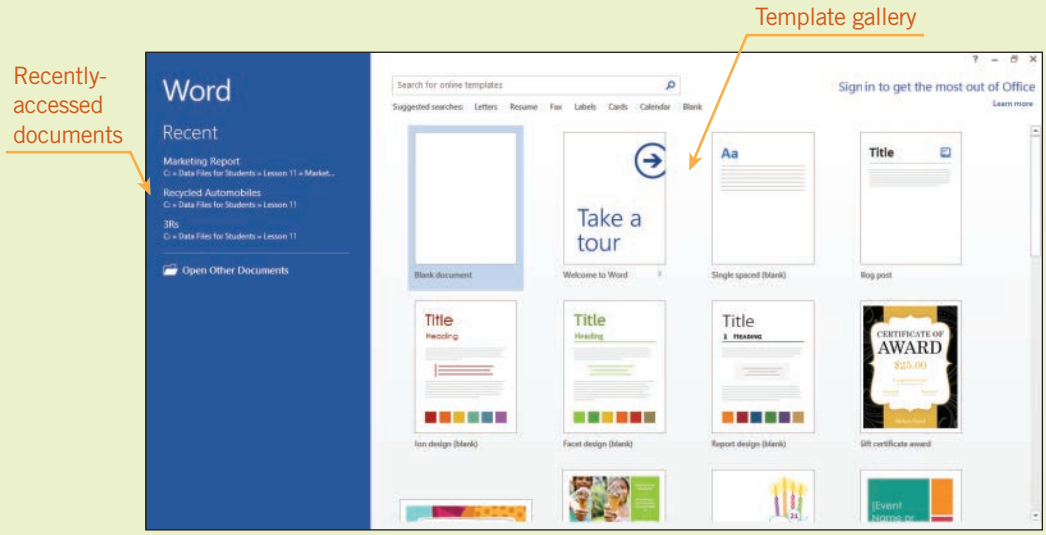


FIGURE 11–2
Word 2013 opening screen

3. In the template gallery on the right, click the **Blank document** thumbnail. The Word application window shown in **Figure 11–3** opens. The title bar includes the application name. The callouts in the figure will help you identify parts of the window when they are referenced in the following steps.

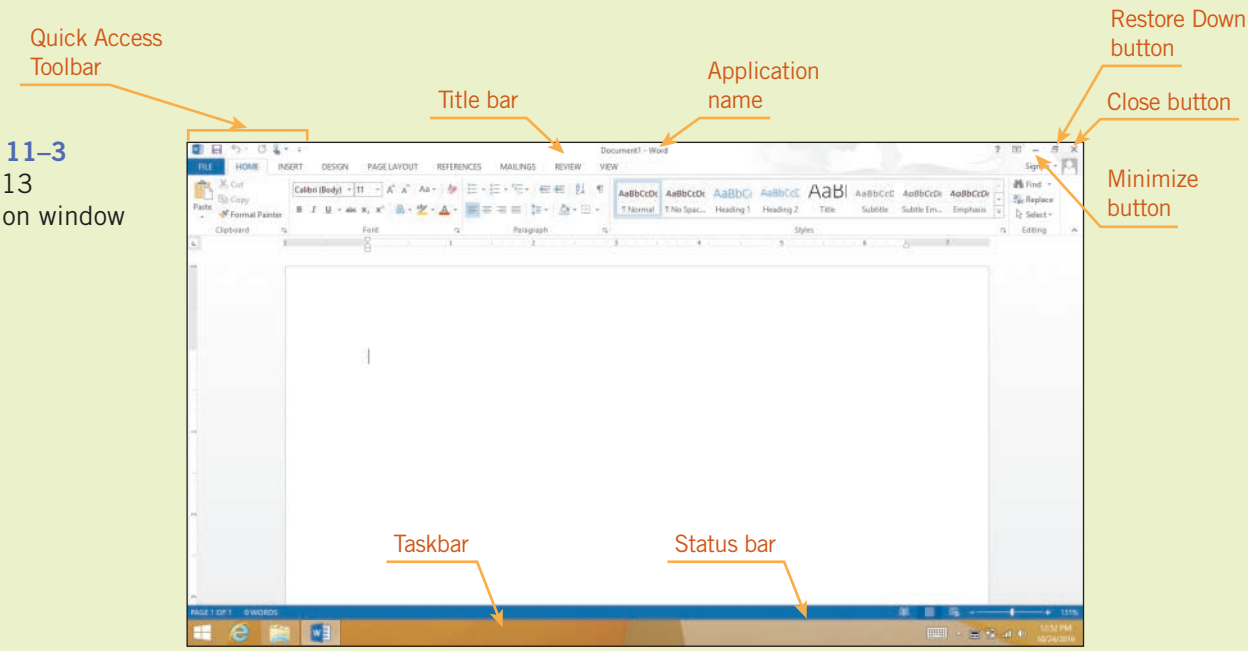


FIGURE 11–3
Word 2013 application window

4. Using one of the processes described in Step 1, display the Start screen again. Type **excel**. Windows automatically brings up a search box and begins filtering results for the application name. The list of results shrinks as you type each letter in the application name. When you see the Excel 2013 application in the results list on the right side of the screen, click the application name.
5. In the Excel template gallery, click the **Blank workbook** thumbnail. The application window opens and shows a layout structure for a spreadsheet. The title bar at the top of the window includes the application name. Excel is now the active application. The Word application window may no longer be visible on the screen, but Word is still open and running.
6. Display the Start screen. Search for and open the Access 2013 application. In the Access template gallery, click the **Blank desktop database** thumbnail. A dialog box opens and displays a proposed filename for the new file. In the dialog box, click the **Create** button to accept the proposed filename. The application window opens and a new database opens and shows a layout and structure for a database file.
7. Create a shortcut on the desktop to open the PowerPoint 2013 application.
   a. Display the Start screen again. Scroll to show the PowerPoint 2013 tile, but do not open the application. Instead, right-click the **PowerPoint 2013** tile.
   b. In the Apps bar at the bottom of the screen, click the **Open file location** button. A dialog box opens and the PowerPoint application name is selected in the folder where it is stored, similar to that shown in **Figure 11–4**.

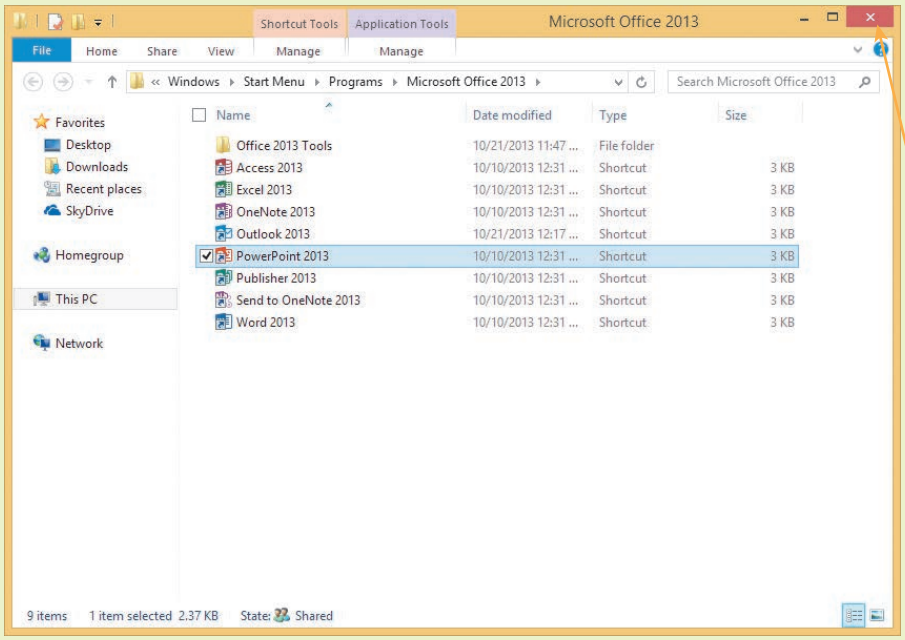


FIGURE 11–4
Location of PowerPoint 2013 program

c. Right-click the selected file **PowerPoint 2013**. A shortcut menu opens. Click **Send to**. A submenu opens as shown in **Figure 11–5**. In the submenu, click **Desktop (create shortcut)**.

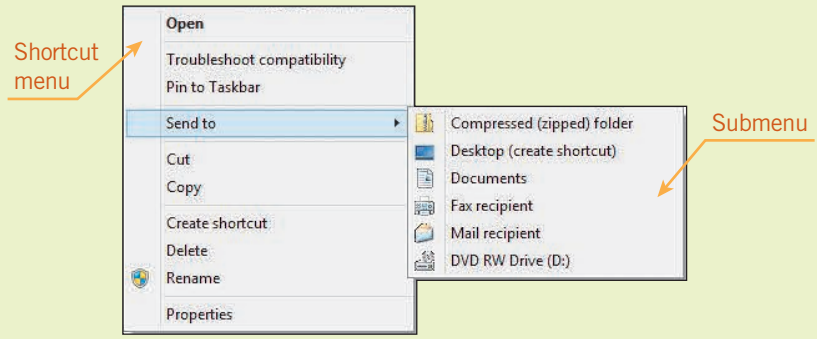


FIGURE 11–5
Shortcut menu with a submenu

d. In the upper-right corner of the dialog box, click the **Close** button.

e. Right-click a blank area on the taskbar at the bottom of the screen, and then in the shortcut menu click **Show the desktop**. The open applications are minimized, and a shortcut button shown in **Figure 11–6** now appears on your desktop.



FIGURE 11–6
PowerPoint 2013 shortcut button on the desktop

QUICK TIP

If you are using Windows 7 or Vista, click the Start menu and then right-click the PowerPoint application. In the shortcut menu, click Send to, and then in the submenu click Desktop (create shortcut).

8. Double-click the **PowerPoint 2013** shortcut button to open the application. In the template gallery, click the **Blank Presentation** thumbnail. The application window opens and shows a blank slide. The title bar includes the application name. Four applications are now running, and buttons for each of the running applications are displayed on the taskbar as shown in **Figure 11–7**.

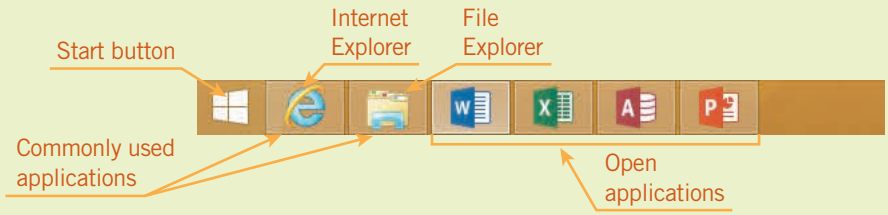


FIGURE 11–7
Taskbar with multiple open application buttons

9. On the taskbar, click the **Word** application button to switch to that application. Then click the **Excel** application button on the taskbar to switch to that application.

10. To rearrange the order of the buttons on the taskbar, click the **Word** button and hold the left mouse button down as you drag the button to the right. When the button is repositioned on the right side of the PowerPoint button, release the mouse button and drop the Word button in the new location.
11. To view multiple running application windows at the same time:
    a. Right-click a blank area on the taskbar, and then in the shortcut menu click **Cascade windows**. The four running application windows are arranged from top to bottom on the screen as shown in **Figure 11–8**.

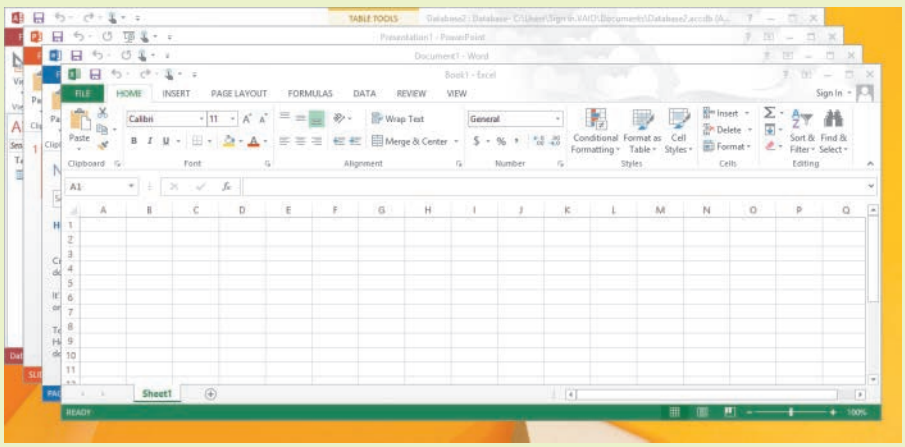


FIGURE 11–8
Cascaded application windows

    b. Right-click a blank area on the taskbar, and then in the shortcut menu click **Undo Cascade all windows**.
    c. Right-click a blank area on the taskbar, and then click **Show windows stacked**. The four application windows are reduced in size and arranged from top to bottom. Open the shortcut menu again and then click **Undo Show all windows stacked**.
12. Right-click a blank area on the taskbar at the bottom of the screen to display the shortcut menu, and then click **Show the desktop**. On the desktop, right-click the **PowerPoint 2013** shortcut button. In the shortcut menu, click **Delete**. The shortcut button is removed from the desktop.
13. Leave the four applications open for the next Step-by-Step.

QUICK TIP

To show windows side by side, you must have no more than 3 application windows open.

Exiting Applications

To close a file, you can click the Close button in the upper-right corner of the screen, or you can click the application button in the upper-left corner of the screen, and then in the menu click Close. If only one document is open, the file will close and the application will also close. So, if you want to close a document and leave the application window open, you can access the Close command in Backstage view. ***Backstage view*** provides quick access to common tasks for managing documents, such as opening, saving, printing, sharing, and closing. If you attempt to close a file or exit an application without saving changes to a document, you will be prompted to save the changes before exiting the application.

VOCABULARY
Backstage view

Step-by-Step 11.2

2-1.3.1
2-1.3.3

1. If necessary, start the **Word, Excel**, **PowerPoint**, and **Access** applications, all with blank documents. Click the **PowerPoint** button on the taskbar to display the PowerPoint application window.
2. In the upper-right corner of the PowerPoint application window, click the **Close** button. The PowerPoint application window closes, and the application is no longer running.
3. Click the **Access** button on the task bar. In the upper-right corner of the Access application window, click the **Close** button.
4. You should see the Excel and Word buttons on the taskbar because those applications are still running. On the taskbar, click the **Excel** application button. In the upper-left corner of the application window, on the Quick Access Toolbar, click the **Excel** program button and then in the menu click **Close**. Because only one Excel document is open, the active document and the application both close.
5. The Word application is still running. If you do not see the Word application window, click the **Word** button on the taskbar. In the upper-left corner of the screen, click the **FILE** tab. Backstage view opens, as shown in **Figure 11–9**.

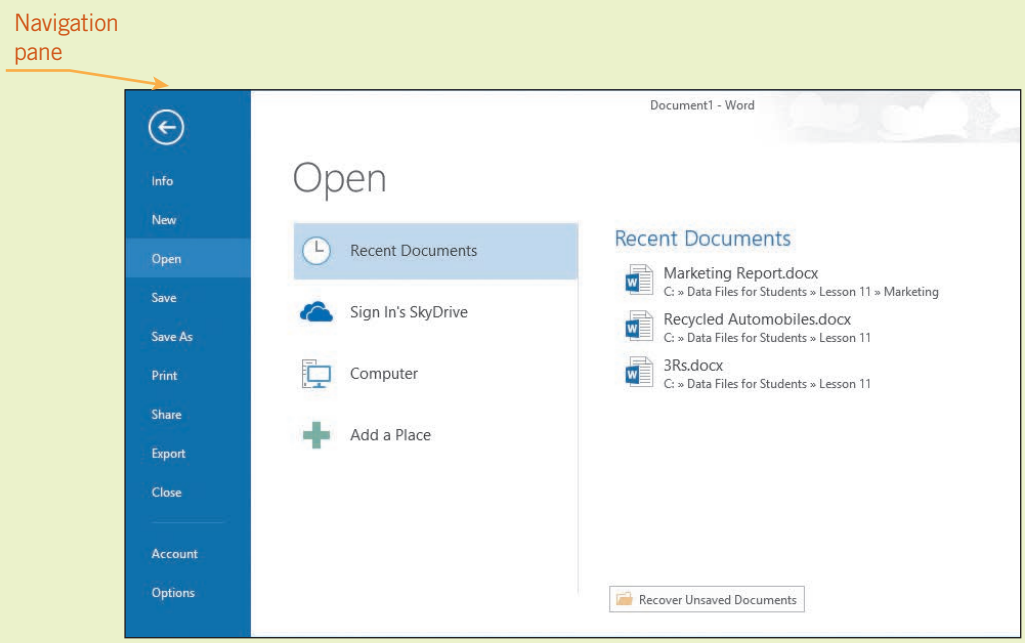


FIGURE 11–9
Backstage view in the Word 2013 application

6. In the Navigation pane on the left, click **Close**. The document is closed and the Word application remains open.
7. Click the **FILE** tab and then in the Navigation pane click the **New** command. In the template gallery, click **Blank document**.
8. Leave the Word application and the blank document open for the next Step-by-Step.

Navigating Application Windows

VOCABULARY
document window
insertion point
cursor
I-beam
scroll

The application window includes many of the elements of all Windows screens, including the title bar, scroll bars, and the status bar. These elements are labeled in **Figure 11–10**. The ***document window*** is the area where you type new text and data or change existing text and data. The application windows can be resized on your screen by using the Minimize, Maximize, and Restore Down buttons.

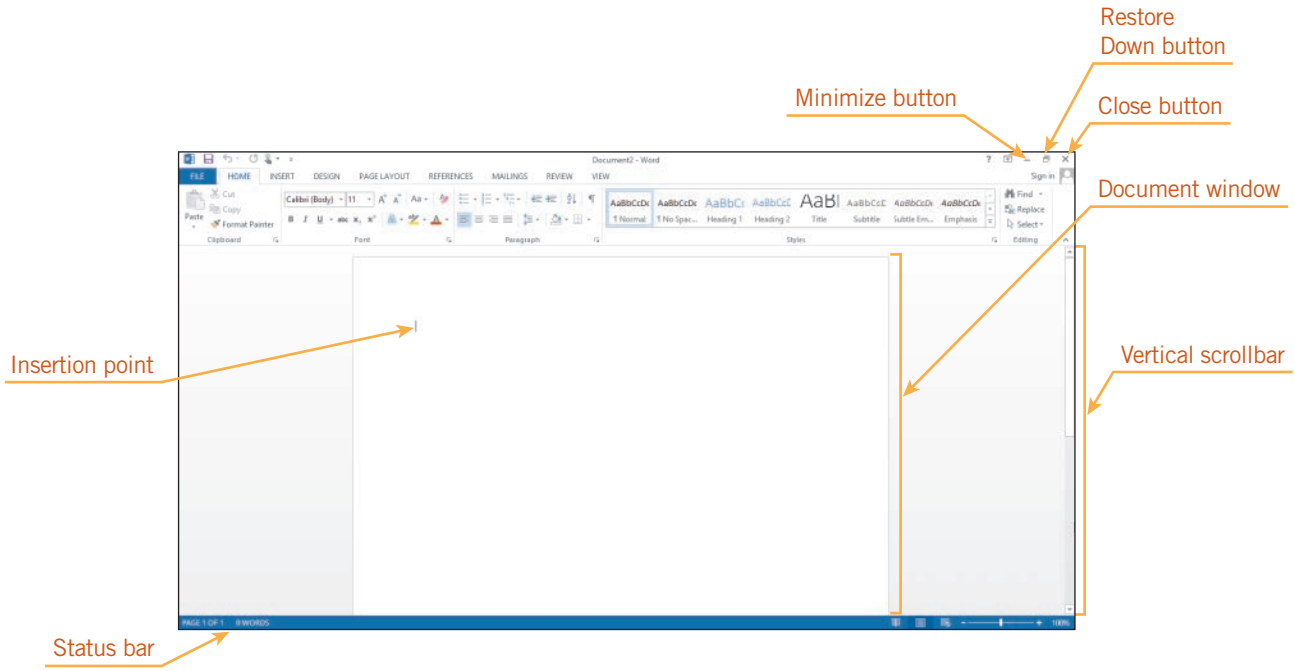


FIGURE 11–10 Word 2013 application window

The ***insertion point*** (often referred to as the ***cursor***) is a blinking vertical line that indicates the location in the document where the new text and data will be entered. The arrow keys on the keyboard move the insertion point up, down, left, and right in the document. The Page Up and Page Down keys move the insertion point in bigger increments. To use the mouse to reposition the insertion point, simply move the mouse pointer to the desired location within the document. When positioned within the document window, the pointer changes from an arrow to an ***I-beam***, which looks like a capital letter *I*. Position the I-beam over the text in the document where you would like to reposition the insertion point, and then click.

When you ***scroll*** through a document, you move through the document window on the screen without changing the location of the insertion point. The display on the screen adjusts as you scroll. To scroll, use the horizontal or vertical scroll bars. Other convenient ways to scroll, if available, are to use the wheel on the mouse or the trackpad or to swipe the touchscreen.

Step-by-Step 11.3

IC3
2-1.3.1
2-1.3.4

1. If necessary, start **Word** and create a blank document. The insertion point is blinking in the document window.
2. If necessary, click the **Maximize** button to change the size of the window to fill the screen as shown in Figure 11–10. When the Maximize button is not displayed in the top-right corner of the screen, the document is already maximized.
3. To adjust the size of the window, in the upper-right corner of the window, click the **Restore Down** button, shown in Figure 11–10. The window size is reduced. Note that when the window is restored down, the Maximize button appears in place of the Restore Down button.
4. Position the mouse pointer over the border on the right side of the window. When the mouse pointer changes to display the Horizontal Resize arrow, click and drag the **border** to the left to adjust the width of the window. Then, point to the title bar on the window and click and drag the **window** to the top of the screen. When you release the mouse button, the window is maximized.
5. In the upper-right corner of the window, click the **Minimize** button to hide the application window. Notice that the Word button still appears on the taskbar because the application is still running.
6. Click the **Word** button on the taskbar to reopen the application window. The window opens to the previous maximized window size.
7. To return to the previous customized window size, click the **Restore Down** button. Then, click the **Maximize** button once more.
8. The insertion point is still blinking in the document window. Type your first name. Notice that the insertion point moves as you type text. Press **Enter** five times. Notice that each time you press Enter the insertion point moves farther down in the document window. Type your last name.
9. Press the **Page Up** key. The insertion point moves back to the top of the document window and is now positioned in front of your first name.
10. Press the **down arrow** key five times to move the insertion point to the end of your last name. Then press the **up arrow** key five times to move the insertion point to the end of your first name.

QUICK TIP

The arrow keys and the Page Up and Page Down keys will not move the insertion point in a blank document. As soon as text and data are added to the document, the keys will perform as described.

11. On the vertical scroll bar at the right side of the document window (see **Figure 11–11**), drag the **scroll box** all the way down to view the end of the document. Then click the **up** scroll arrow several times until you see your last name in the document window. Note that as you scroll through the document window the insertion point does not move. Scroll to the top of the document window. The insertion point is still positioned at the end of your first name.

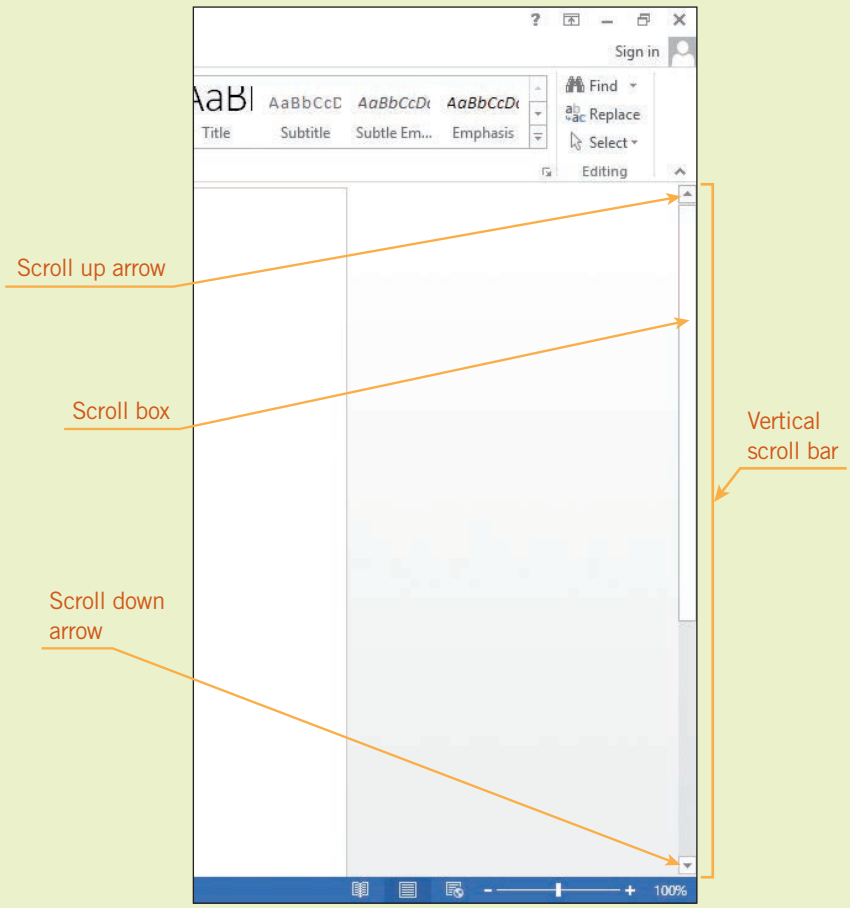


FIGURE 11–11
Scroll bar tools

12. If there is a scroll wheel on the mouse you are using, move the scroll wheel forward and backward to scroll through the document. Note that the insertion point does not move as you scroll through the document using the scroll wheel on the mouse.
13. If necessary, drag the **scroll box** to the top of the vertical scroll bar. Position the mouse pointer (I-beam) to the left of the first character in your last name and then click the left mouse button. The insertion point now appears in the new position. Type your middle name or a middle initial, and then press the **spacebar**.
14. In the upper-left corner of the screen, click the **Word** button and then click **Close**. When prompted to save changes you made, click **Don't Save**. The document closes, and the application closes.

Using the Office User Interface

The Office applications use a visual design referred to as the Microsoft Office Fluent user interface. There are many features in this new design that make the software more intuitive and easier to use.

Using the Office Ribbon

VOCABULARY
Ribbon
ScreenTip

The ***Ribbon*** is the banner that stretches across the top of the screen, just below the title bar. The Ribbon user interface displays several tabs, including the HOME tab, shown in **Figure 11–12**. The Ribbon makes it easy to find commands because related commands and options are organized in groups on each tab. For example, all of the commands for formatting characters appear in the Font group. A dialog box launcher (a small arrow) appears in the lower-right corner of some groups, and when clicked, a dialog box opens with even more options related to the group.

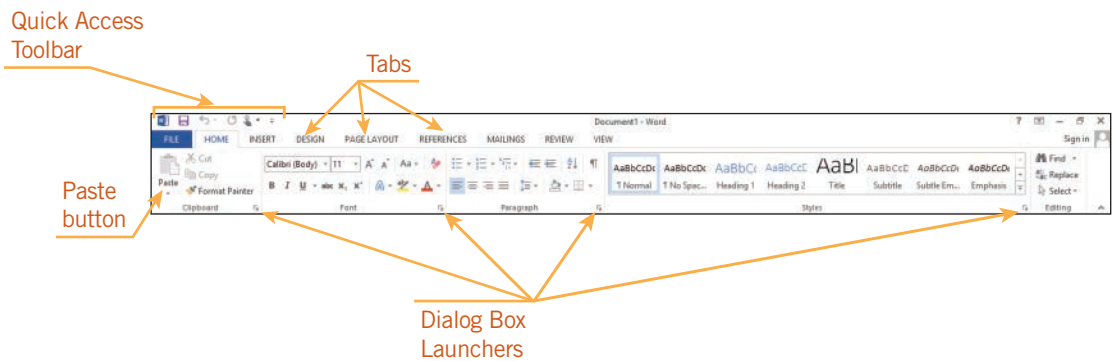


FIGURE 11–12 Ribbon user interface

What makes the Ribbon so unique is that it changes to meet your needs. As you work in a document, the Ribbon adapts by providing appropriate commands and options. For example, if you insert a picture in your document, the Ribbon changes to display tabs related to formatting pictures—hence, the word fluent in Office Fluent user interface.

If you do not know the function of a button in any of the groups, position the mouse pointer over the button, but do not click. After a second or two, the name and a description of the command are displayed in a window called a ***ScreenTip***.

If you prefer to use the keyboard instead of the mouse, you can access the tabs on the Ribbon by using keyboard shortcuts that you can display on the Ribbon. Commands can also be accessed with legacy keyboard shortcuts, which have been around for many versions of the application. When a keyboard shortcut is available for the command, the shortcut is included in the ScreenTip.

To maximize the screen space for your document, you can easily minimize the Ribbon by double-clicking one of the tabs. To restore the Ribbon to its original size, you simply double-click one of the tabs.

Step-by-Step 11.4

1. Start **Word** and create a new blank document. The HOME tab is the active tab, as shown in Figure 11–12.
2. In the Clipboard group, position the mouse pointer over the **Paste** button. Do not click the Paste button. Wait a second or two for the ScreenTip to appear, as shown in **Figure 11–13**. The ScreenTip provides the button name, a keyboard shortcut, and a description of its function.

IC3
2-1.1.1
2-1.3.1
2-1.3.3
2-1.3.4

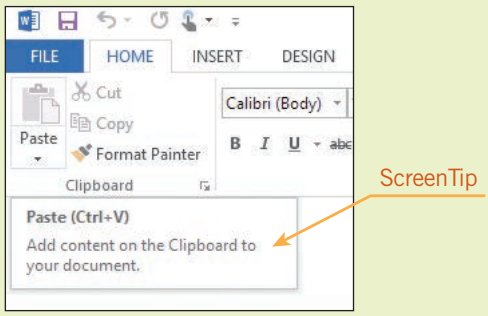


FIGURE 11–13
ScreenTip for the Paste button

3. Click the **INSERT** tab on the Ribbon. The groups and options change. Position the mouse pointer over several of the commands on the INSERT tab to display their ScreenTips.
4. Click each of the remaining Ribbon tabs to view the groups and commands. You will see that the groups and commands are very different on each tab. Click the **HOME** tab.
5. Press **Alt**. Letters for keyboard shortcuts appear under each tab name on the Ribbon. For example, the letter N appears under the INSERT tab name. Note that more shortcut keys appear in each of the groups. You can press those letters to execute the commands. Press **Alt** again to hide the letters.
6. Press **Alt**, and then press **P** to display the Page Layout tab. Press **M** to display the Margin options. When a command or option is executed, the shortcut keys disappear. Press **Esc** to hide the Margin options. Then press **Alt** once again to hide the keyboard shortcuts.

QUICK TIP

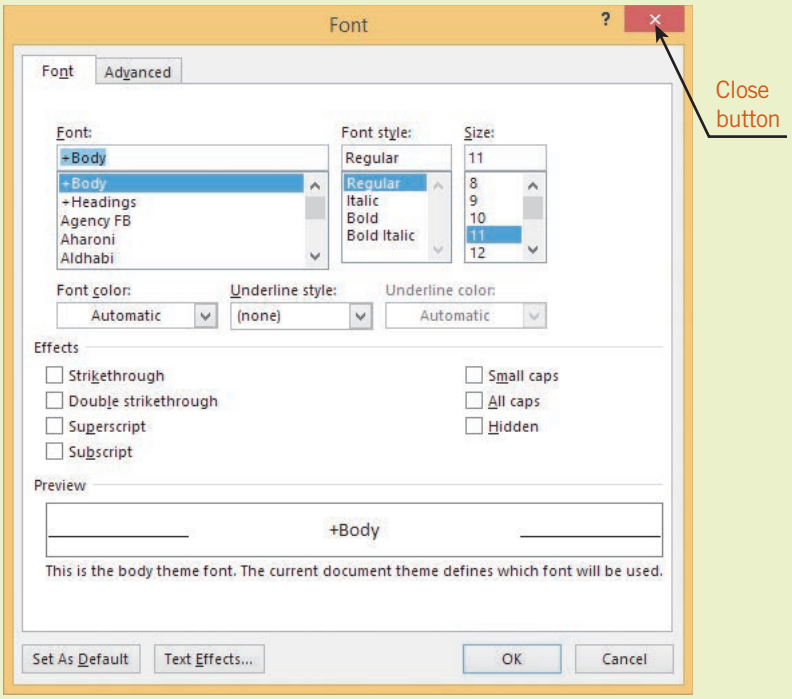
If you have a touchscreen, you can enable the Touch mode command. The Ribbon will increase in height to allow you more space to touch the commands.

QUICK TIP

To hide the keyboard shortcuts without executing a command, press Alt, press Esc, or click a different tab name.

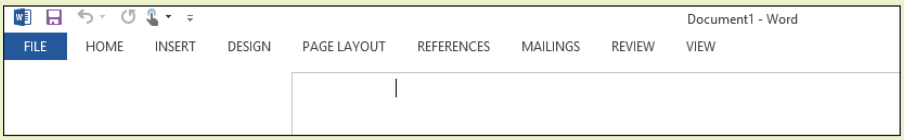
7. Click the **HOME** tab. In the Font group, click the **dialog box launcher**. The Font dialog box, similar to the one shown in **Figure 11–14**, opens.

FIGURE 11–14
Font dialog box



8. In the upper-right corner of the dialog box, click the **Close** button to close the dialog box.
9. Double-click the **HOME** tab. The groups and command buttons are hidden, and only the tab names are displayed, as shown in **Figure 11–15**.

FIGURE 11–15
Ribbon minimized



10. Click the **HOME** tab. All the groups on the HOME tab are displayed. Click the **INSERT** tab. All the groups on the INSERT tab are displayed.
11. Click anywhere within the document window. The Ribbon automatically minimizes again. The Ribbon also minimizes when you choose a command or option.
12. Double-click any one of the tabs to maximize the Ribbon. Click anywhere within the document window. The Ribbon is no longer minimized.
13. Leave Word open for the next Step-by-Step.

Customizing the Quick Access Toolbar

By default, the Quick Access Toolbar is positioned above the Ribbon in the upper-left corner of the application window. This toolbar offers quick access to commands you use frequently. The default settings, as shown in **Figure 11–16**, include only four options—the Save, Undo, Redo or Repeat, and Touch/Mouse Mode commands. However, you can customize the toolbar to include the commands you use most often. Keep in mind that the intent of the toolbar is for quick access. If you add too many commands and the toolbar becomes cluttered, it may slow you down.

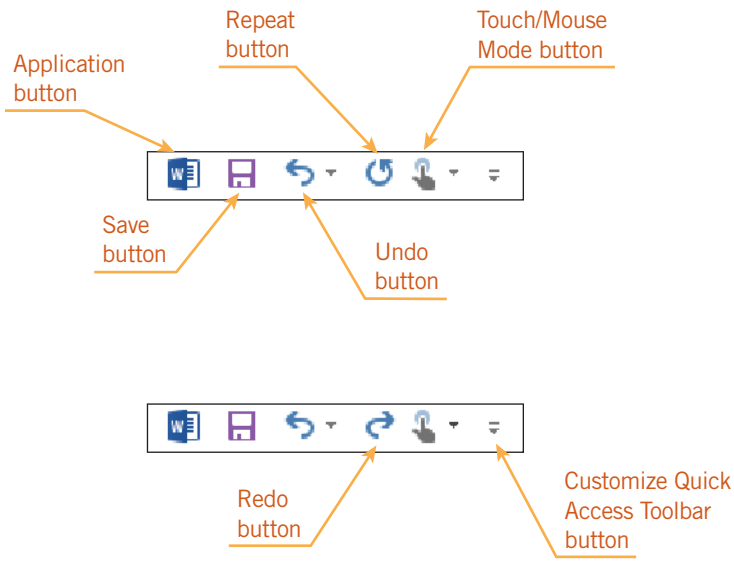


FIGURE 11–16
Quick Access Toolbar

ABOVE AND BEYOND

You can move the Quick Access Toolbar so it appears below the Ribbon. Click the Customize Quick Access Toolbar button, and then click the option Show Below the Ribbon.

Step-by-Step 11.5

IC3 2-1.1.7

1. If necessary, start **Word** and create a blank document. On the Quick Access Toolbar in the upper-left corner of the screen, click the **Customize Quick Access Toolbar** button. A menu appears. The current commands on the toolbar are identified with a check mark.
2. In the menu, select a command that is not already on the toolbar (a command without a check mark). The new command button is added to the toolbar. Note which command you added to the toolbar.

3. Click the **Customize Quick Access Toolbar** button. At the bottom of the shortcut menu, click **More Commands...** to open the Word Options dialog box shown in **Figure 11–17**. In the left pane, the Quick Access Toolbar option is already selected. The buttons currently displayed on the Quick Access Toolbar are listed in the right pane.

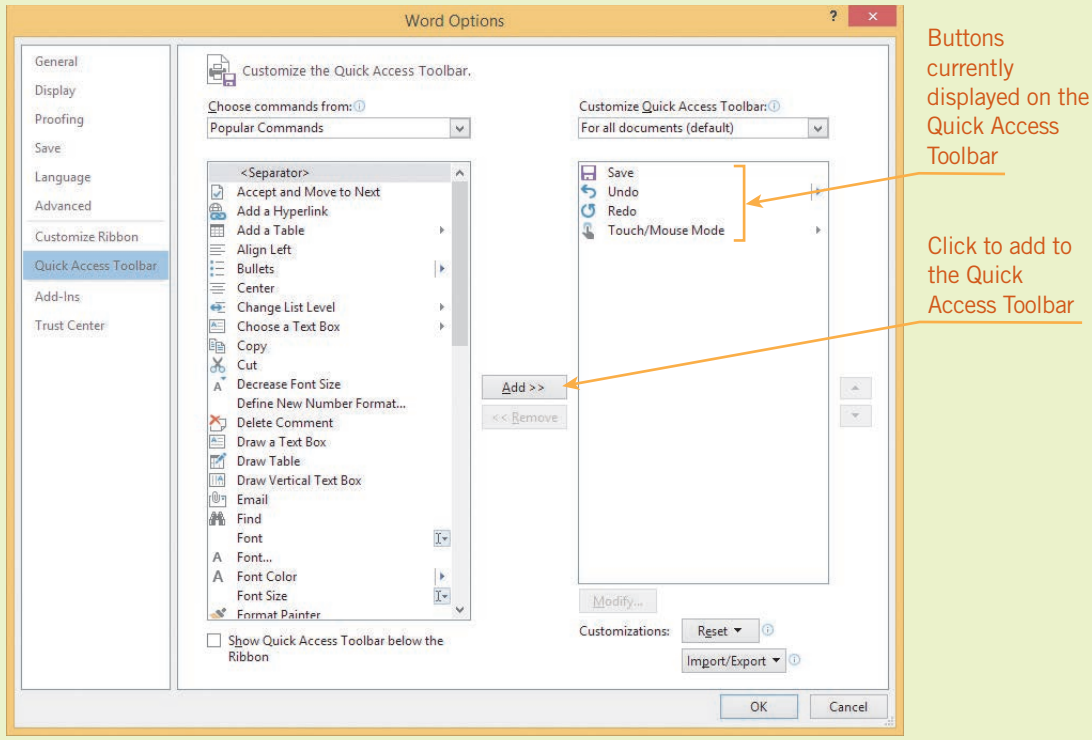


FIGURE 11–17
Word Options dialog box

4. In the middle pane, select a command that is not currently displayed on the Quick Access Toolbar. Between the middle and right panes, click **Add** to add the command to the pane on the right. The list in the right pane is updated.
5. In the middle pane, select another command that is not currently displayed on the Quick Access Toolbar, and then click **Add**. Note that the last three commands in the list are the commands that you added to the toolbar.
6. Click **OK** to accept the changes and close the dialog box. The width of the Quick Access Toolbar expands and three new command buttons are now displayed on the right side of the toolbar.
7. Click the **Customize Quick Access Toolbar** button, and then click **More Commands...**. In the pane on the right, select the last button in the list.
8. Between the middle and right panes, click **Remove**. At the bottom of the Word Options dialog box, click **OK** to accept the change and close the dialog box. Note that the button is removed from the toolbar.

9. On the Quick Access Toolbar, right-click one of the two remaining new buttons you added to the toolbar. In the menu, click **Remove from Quick Access Toolbar**.
10. Click the **Customize Quick Access Toolbar** button. In the menu, click the last remaining new button you added to the Quick Access Toolbar. The command button is removed from the toolbar.
11. Leave Word open for the next Step-by-Step.

Opening, Saving, and Closing Documents

You use similar procedures to open and save documents in all Office applications. To ***open*** a document means to load a file into an application. A ***file*** is a collection of information saved as a unit. Each file is identified by a filename. Remember that the terms *document* and *file* are used interchangeably.

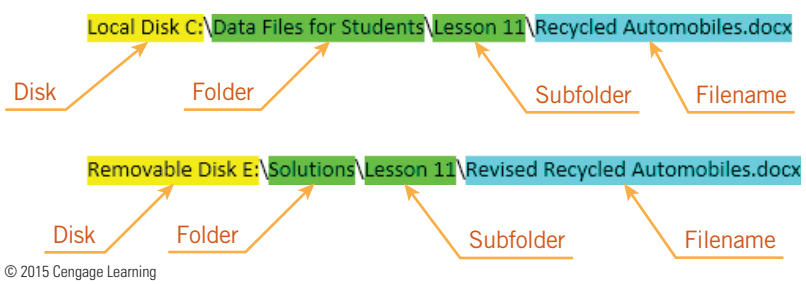
VOCABULARY
open
file
file extension
folder
subfolders
path

Opening a Document

The Open command in Backstage view, which is accessed using the FILE tab, enables you to open a file from any available disk and folder. You can also open a document by navigating to the document on the desktop or by using File Explorer. Once you locate the file, double-click the filename. If necessary, your computer will start the associated application (such as Word or Excel), and then the document will open.

A ***file extension*** identifies the type of file. A period separates the filename and the extension. The extension is usually three or four characters and varies depending on the application used to create the document. For example, Word automatically assigns the extension .docx, PowerPoint assigns the extension .pptx, and Excel assigns the extension .xlsx. The x in the extensions indicates the XML format. You can quickly identify documents created in versions of these applications prior to Office 2007 because the file extensions created in those applications are .doc, .ppt, and .xls.

A ***folder*** is a means for organizing files into manageable groups on a designated storage device. All computer files are saved in folders. ***Subfolders***, folders within folders, can also be created. The ***path*** is the route the operating system uses to locate a document. The path identifies the disk and any folders relative to the location of the document. **Figure 11–18** shows two typical paths and identifies the items in the paths. The first example shows a document named Recycled Automobiles.docx saved in a subfolder titled Lesson 11. The Lesson 11 folder is, in turn, stored in a folder titled Data Files for Students, which can be found on the local (this computer's) hard drive—drive C. In the second example, the Word document named Revised Recycled Automobiles.docx is saved in a subfolder called Lesson 11, which is in turn stored in a folder titled Solutions, which can be found on a Flash/USB removable memory, which in this example is identified as Removable Disk E.



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FIGURE 11–18
Typical paths to the file locations

Just as you can open multiple applications, you can also open multiple documents within each application. When multiple documents are open within one application, the taskbar displays the documents stacked behind the application button. Point to the application button on the taskbar to display thumbnails of each of the open documents for that application. Then to make a document active, click the document thumbnail. When you right-click the application button on the taskbar, a Jump List is displayed above the button. A ***Jump List*** is a collection of links that provides quick access to files and data. The links displayed in a Jump List vary depending on the application. For example, a Jump List for an Office application provides shortcuts to recently accessed documents. A Jump List for Internet Explorer provides shortcuts to frequently accessed Web sites.

VOCABULARY
Jump List

Step-by-Step 11.6

IC3
2-1.1.7
2-1.3.1
2-1.3.6

1. If necessary, open Word and create a new blank document. Click the **FILE** tab and then click **Open**. In the left pane, a list of locations is displayed, as shown in **Figure 11–19**. In the left pane, *Recent Documents* is selected, and a list of recently-accessed documents appears in the right pane. If the document you want to open is in that list, you can click the document filename and the file will open. Do not click any filenames in the Recent Documents list.

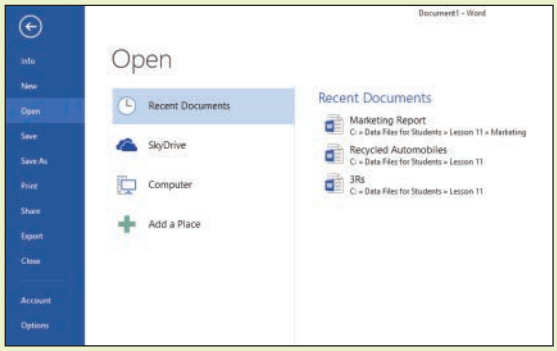


FIGURE 11–19
Recently-accessed documents

QUICK TIP

You can control the number of filenames that appear in the Recent Documents list by changing the display settings in the Word Options dialog box. Click File, click Options, and then click Advanced. Scroll down, and under the heading Display, change the setting for Show this number of Recent Documents. The maximum number of documents you can display is 50.

2. In the left pane, click **Computer**. The current and recent folders are listed in the right pane. Click the **Browse** button, and using the Open dialog box, navigate to the folder containing your Lesson 11 data files. (Your instructor can provide this information.) For example, in **Figure 11–20**, the Lesson 11 folder is stored in a folder named Data Files for Students. If necessary, in the lower-right corner of the dialog box, click the **File type** list arrow and select **All Word Documents (*.docx;...)**. In the Lesson 11 folder, you will see a subfolder, Marketing, and two Word files, Recycled Automobiles.docx and 3Rs.docx.

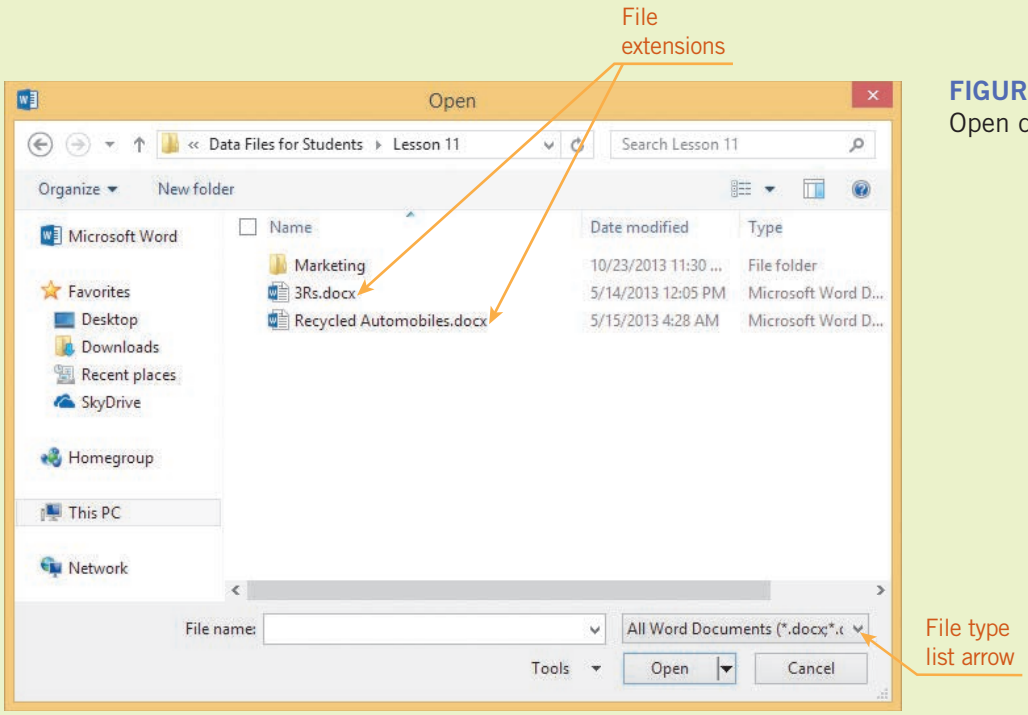


FIGURE 11–20
Open dialog box

3. If the filenames in the Open dialog box do not include the file extensions shown in Figure 11–20, complete the following steps.
   a. Open the Start screen and type **control panel**. Then open the Control Panel.
   b. Click **Appearance and Personalization**, and then click **Folder Options**. The Folder Options dialog box opens.
   c. Click the **View** tab. Under *Advanced settings*, click the checkbox for **Hide extensions for known file types**. The checkmark is removed from the box.
   d. Click **OK** and then in the upper-right corner of the Control Panel window, click the **Close** button.

4. In the lower-right corner of the dialog box, click the **File type** list arrow, and then click **All Files (*.*)**. See **Figure 11–21**.

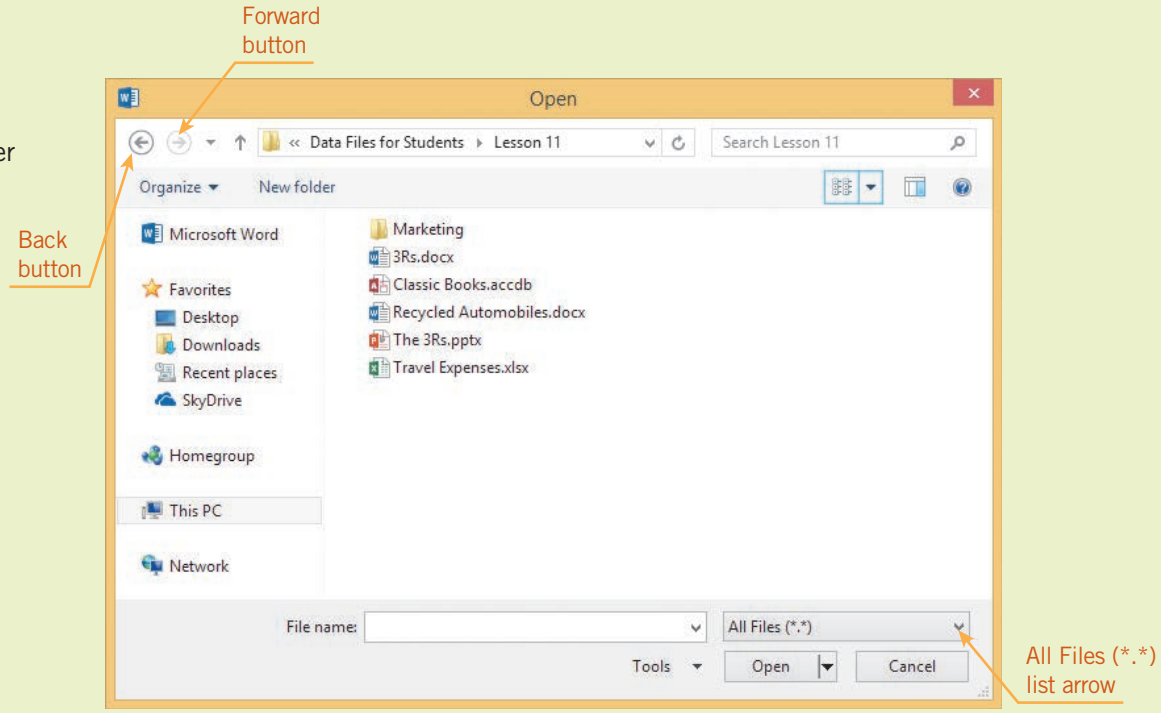


FIGURE 11–21
All files in the Lesson 11 folder

5. Click the filename **3Rs.docx** once to select it. At the bottom right of the dialog box, click the **Open** button. The document is displayed in the document window.
6. Click **FILE** and then click **Open**. In the middle pane, click **Computer**. The recently-accessed folders display in the right pane. Click the **Lesson 11** folder name, and then double-click the filename **Recycled Automobiles.docx** to open the file.
7. Start **Excel**. In the Navigation pane, click **Open other workbooks**. Click **Computer** and then click **Browse**. Navigate to the disk and folder where your Data Files folder is stored. Open the **Lesson 11** folder, and then open the **Marketing** folder. In the lower-right corner of the dialog box, click the **File type** list arrow, and then click **All Files (*.*)**. Note that there is also a Word file Marketing Report.docx in that subfolder. Also note that the current path for the location of the document is displayed at the top of the Open dialog box.

QUICK TIP

To open multiple documents at the same time, click the first filename in the Open dialog box, hold down Ctrl, and click one or more additional filenames, then click Open.

8. Navigate through the folders:
   a. In the upper-left corner of the dialog box, click the **Back** button to return to the list of folders and files in the Lesson 11 folder.
   b. Click the **Back** button again to return to the folder or disk where the Lesson 11 folder is stored.
   c. Click the **Forward** button to return to the list of folders and files in the Lesson 11 folder.
   d. Double-click the filename **Travel Expenses.xlsx** to open the file.
9. Click the **FILE** tab, and then click **Open**. Notice that the document you just opened in Excel, *Travel Expenses.xlsx*, appears at the top of the Recent Workbooks list. Press **Esc** to close Backstage view and return to the Excel document window.
10. On the taskbar, click the **File Explorer** button. In the left pane, navigate to the disk where your Data Files folder is stored. In the right pane, navigate to the folder where your Data Files folder is stored. Double-click the **Lesson 11** folder, and then double-click the filename **The 3Rs.pptx**. PowerPoint starts, and the presentation opens.
11. Position the mouse pointer over the *Word* button on the taskbar. Document thumbnails are displayed for the two open documents, as shown in **Figure 11–22**. Note that thumbnails appear when the Windows theme setting is default Windows. If your Windows theme is not set for default Windows, you may see a ScreenTip showing the document filename and the application name.

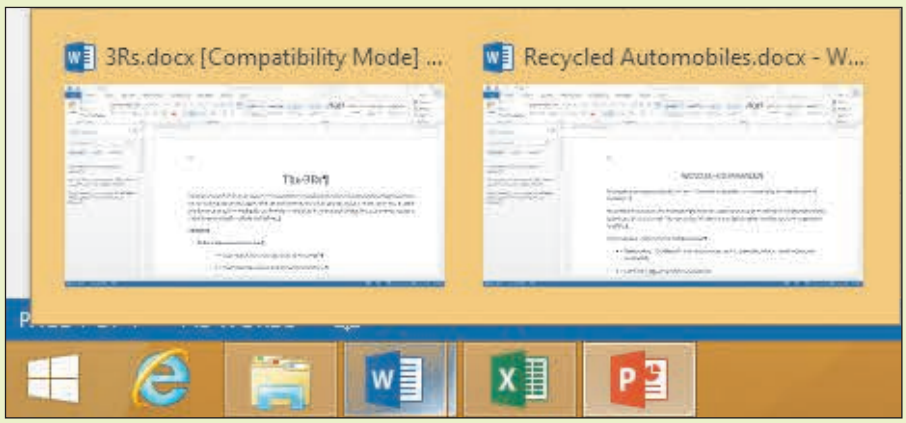


FIGURE 11–22
Document thumbnails using default Windows 8 theme

ABOVE AND BEYOND

To preview a file before opening it, open the File Explorer. Click the VIEW tab and in the Panes group enable the option Preview pane. When you select a filename, the document will be displayed in the Preview pane. Click anywhere in the Preview pane and scroll through the document.

QUICK TIP

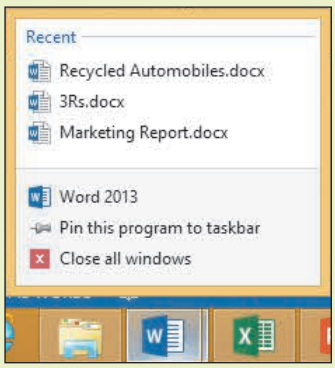
To close Backstage view and return to the document window without closing the document, you can also click the arrow at the top of the navigation bar.

QUICK TIP

You can also navigate to a file or folder by clicking the File Explorer button and then click Computer and navigate to the drive and folder.

12. Right-click the **Word** button on the taskbar. A Jump List, similar to the one shown in **Figure 11–23**, appears above the button showing the recent files accessed in Word. Your Jump List may differ. In the Jump List, you can click a link to switch to another document.

FIGURE 11–23
Jump List for Word 2013 application



13. Click the **Word** button on the taskbar to hide the Jump List and display the two document thumbnails. Then click the **3Rs.docx** thumbnail.
14. Click the **VIEW** tab on the Ribbon. In the Window group, click the **Switch Windows** button and then click the **Recycled Automobiles.docx** filename to open that window. Leave all the documents and applications open for the next Step-by-Step.

Solving Problems with Opening Documents

You may encounter some problems when opening files. The following are descriptions of common problems:

VOCABULARY
file compatibility

- There is a problem with file compatibility. ***File compatibility*** refers to the ability to open and work with files without a format conflict. In most cases, files that were created with an older version of an application can be opened in the newer version of the application. But sometimes, files created in newer applications are not backwards compatible, meaning that they cannot be opened in older versions of the application. Office 2013 files are saved in a new format, and they will not normally open in versions of Office applications prior to Office 2007. Microsoft does, however, provide a free download of compatibility software to enable users with older versions of Office to open, edit, and save files created and saved in the new Office 2013 format.
- You may also encounter compatibility problems if you are working in a different operating system than the one in which the file was created. For example, if a file was created in PowerPoint on a Macintosh, it may not open in PowerPoint on a PC. This problem generally occurs if you are working with different versions of the software across the different platforms. With a little effort, however, you can usually find a way to open and use almost any file from an Office application.
- If when you use the Open command from the FILE tab you do not see the file you are looking for, the recent documents list, it could be caused by a number of reasons. First, you need to verify the document was saved before it was closed. Second, you need to verify you are looking in the correct disk and the correct folder, as the file you are looking for may be stored in a different location. If the file is stored in a remote storage area or on a network, you must make sure you

have access to the storage area or the network. If you are unsure of the location of the file, you can use the Search command, available in the upper-right corner of the Open dialog box, to locate the file. To use the Search feature, you must identify the disk and/or folders in the box to the left of the Search box. Or, you can click the Start button and type the filename in the Search box.

- The file is in a format that cannot be read by the application you are using. For example, if you attempt to open an Access file using the Open command in Word, you will not see the file listed. You can switch the file type setting within the Open dialog box to display All Files, but that does not necessarily mean that the application you are using will be able to open the file.
- You encounter a corrupted file or a file that will not open. When you attempt to open a file, the application may display an error message as you try to open the file. For example, a virus checker may be stopping you from opening the file. Often a corrupted file may just not open, or it may cause the application to shut down. In these cases, you can try to open the file on a different computer to verify that the file is indeed corrupt and that there is not something wrong with your computer.

Saving a Document

VOCABULARY
save

To ***save*** a document means to store it on a disk or other storage medium. You can save a document to the hard drive on your computer, to an auxiliary drive or a network location, or to portable media such as Flash/USB removable memory or a writable CD or DVD. A file extension is automatically added to the filename when the document is saved.

To make it easier to find documents, choose filenames with words that help describe the document. The complete path to the file can include up to 255 characters. Filenames cannot include any of the following characters: \ / : * ? " < > |.

You should make a habit of saving frequently and also after making any major changes to your document. The quickest and easiest way to save a document is to click the Save button on the Quick Access Toolbar. When you click the Save button on the toolbar, the document is saved with the same filename and in the same location. If the file does not already have a name, the Save As dialog box will open and you can type a name for the file. Unless you specify a disk and a folder, the file will be saved to the default location, which is usually in the Documents folder on drive C. When you change the filename or the location where the file is stored, the original document, with the original name, remains unchanged. When you use the Save As command, you also have the opportunity to change the document format. Each application offers a number of choices for formats to save files in.

There are several options for closing a document. When you open Backstage view, you can access the Close command, which will close the active document. If you attempt to close a document without saving changes to a document, you will be prompted to save the changes before closing. You can also close the active document and exit the application by clicking the Close button in the upper-right corner of the application window. If multiple documents are open, clicking the Close button will close only the active document. When only one document is open, clicking the Close button will close the document and exit the application.

When you point to an application button on the taskbar, thumbnails of the open documents are displayed above the button. You can close a document by clicking the Close button on the thumbnail. Whether you click the Close button in the application window or the Close button on the thumbnail, when you close the last open document, the application closes too.

Step-by-Step 11.7

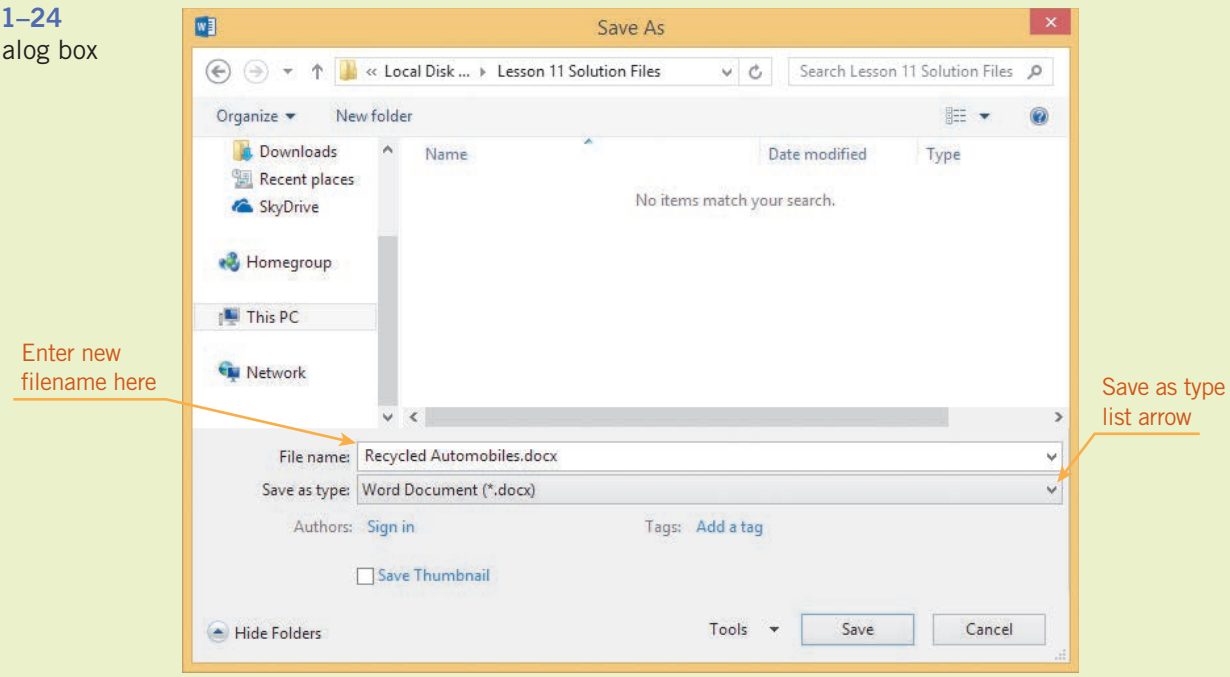
IC3
2-1.3.1
2-1.3.2
2-1.3.6

1. If necessary, open the **3Rs.docx**, **Recycled Automobiles.docx**, **Travel Expenses.xlsx**, and **The 3Rs.pptx** documents.
2. On the taskbar, point to the *Word* button. Two thumbnails are displayed above the Word button. Click the **Recycled Automobiles.docx** thumbnail to open that document window.
3. Click the **FILE** tab, and then click **Save As**. In the Navigation pane, *Computer* is selected. In the right pane, click **Browse** and navigate to the folder where you are to save your solution files. (Follow your instructor's directions about where to save the files.) The Save As dialog box shown in **Figure 11–24** opens. The path where the file will be stored is displayed at the top of the dialog box.

ABOVE AND BEYOND

To create a new folder, in the Save As dialog box, click New folder. The new folder will be added to the folder that is currently open in the dialog box.

FIGURE 11–24
Save As dialog box



4. If necessary, click anywhere in the **File name** box to select the filename *Recycled Automobiles.docx*. Type **Revised Recycled Automobiles**, followed by your initials. The selected text is replaced with the new text.
5. The Save as type box shows the default setting Word Document (*.docx), and this setting is correct, so no changes are needed. At the bottom of the dialog box, click the **Save** button. The document is saved in a new location and with a different filename.
6. On the taskbar, click the **Excel** button to switch to the Travel Expenses document. Click the **FILE** tab, and then click **Save As**. Click **Browse** and navigate to the disk and folder where you are to save your solution files. In the File name box, change the filename to **Updated Travel Expenses**, followed by your initials.

QUICK TIP

Instead of retyping all the characters in a filename, you can position the insertion point in the File name box and then add or delete text from the existing filename.

7. In the Save as type box, the default setting for the Excel file format is Excel Workbook (*.xlsx). Click the **File type** list arrow, and in the list click **Excel 97–2003 Workbook (*.xls)**. With this file format, the document can be opened in earlier versions of Excel. Click **Save**. The file is saved with a new filename and in a new location.
8. In the upper-right corner of the Excel application window, click the **Close** button. The spreadsheet window closes, and because it is the only Excel document, the application also closes.
9. The Revised Recycled Automobiles document is now displayed on the screen. Scroll down and position the insertion point at the end of the last sentence at the end of the document. Press **Enter** and then type your first and last name. On the Quick Access Toolbar, click the **Save** button to save the changes to the document. The document is saved in the same location (your Solutions folder) with the same filename.
10. Click the **FILE** tab to open Backstage view. At the bottom of the pane, click **Close**. The document window closes, but because another Word document is open, the Word application remains open.
11. On the Quick Access Toolbar, click the **Word** button and then click **Close**.
12. Position the mouse pointer over the *PowerPoint* button on the taskbar to display the document thumbnail. Then position the mouse pointer over the document thumbnail. A red Close button appears in the thumbnail, as shown in **Figure 11–25**.

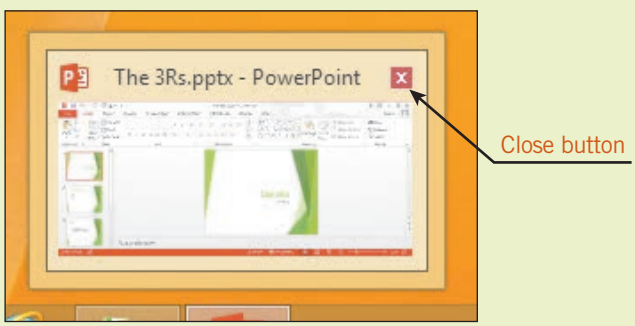


FIGURE 11–25
PowerPoint document thumbnail with Close button

13. Click the **Close** button in the thumbnail to close both the PowerPoint document and the application. In the upper-right corner of the File Explorer window, click the **Close** button.

QUICK TIP

As an alternative to using the Close button, to close the active document window, press Ctrl+F4. To close the active document window(s) and exit the application, press Alt+F4.

Getting Help

Whenever you encounter a problem, your first source of help should be the Help features found in each Office application. If you have an Internet connection, help is always readily available and is just a few mouse clicks away. You simply click the Help button, which looks like a question mark, on the title bar of the dialog box. This button opens a Help window that provides information about the application.

Navigating around the Help screens is much like navigating through a Web page. You can browse the categories presented and click on links to get information about a topic. You can also enter keywords (specific words or phrases) in the Search box. The results for your search will be listed, with links for the most relevant results at the top of the list. Achieving successful search results depends on your ability to identify the keywords that relate to your query. The more search experience you have, the better you will be at recognizing keywords for your searches. To access previous searches, click the Search list arrow.

If you have an Internet connection, you will also have access to all the current Help information available from the Microsoft Office.com Web site or other support specialists. At the Office.com Web site you will find a variety of resources, including tours, slide shows, tutorials, training videos, articles, product user groups, blogs, and the opportunity to chat with Microsoft support personnel. If the word Offline appears at the bottom of the Help dialog box, your computer is not currently connected to the Internet, but you can still access Help information from files stored on your computer. You may need to check with your instructor about how to connect to the Internet from your computer.

Do not overlook another vital source of help: assistance from others. There may be classmates, instructors, or coworkers who are familiar with the application you are using. Or perhaps your workplace has a help desk. You can communicate with support personnel via phone, e-mail, online chat sessions, user groups, and blogs. The key to using these various sources of help is determining what sort of help you need and the quickest or most efficient way to access that help. The idea is to find the assistance you need without interrupting or delaying your work.

NET BUSINESS

Office Web Apps

Microsoft Office Web Apps are online companions to Word, Excel, PowerPoint, and OneNote that enable you to access documents anytime and anywhere. Regardless of where you are, you can create, edit, save, and share your documents. All you need is a connection to the Web. Office Web Apps provide browser-based viewing in which your document appears similar to how it would appear in the application on your computer, with many of the same editing features available. You can access Office Web Apps through Windows Live, and you can store documents to SkyDrive, a free online storage service from Windows Live. With permission, others can also access your documents at SkyDrive, even if they do not have the Office application installed on their computers.

Step-by-Step 11.8

1. Start **Word** and create a new blank document. In the upper-right corner of the application window, click the **Help** button. The Word Help dialog box shown in **Figure 11–26** opens. The dialog box includes a search box and several links for browsing Word Help topics.

2-1.1.8
2-1.3.5

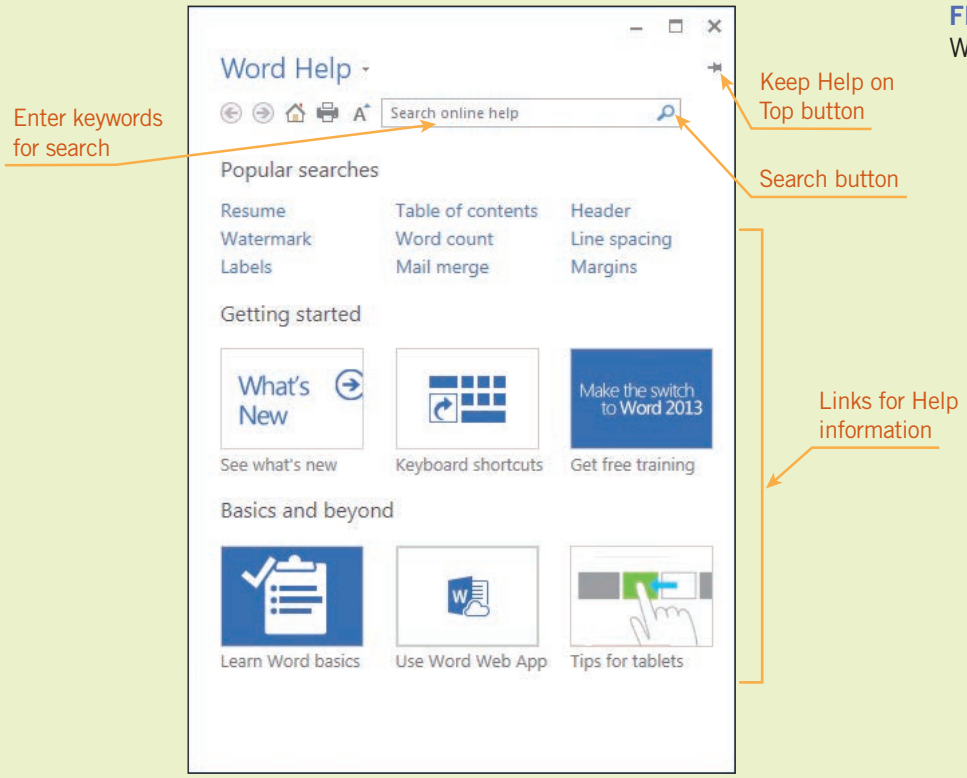


FIGURE 11–26
Word Help dialog box

2. Position the insertion point in the *Search online help* text box. Type the keywords **display recent documents**, and then click the **Search** button. Articles that may provide relevant information are listed.
3. Click the link **Customize the list of recently used files**. (If your computer is connected to the Internet, you may need to scroll down to see the option in the list.) A new article is displayed.
4. If necessary, use the tools on the vertical scroll bar to scroll down so you can view the information under the heading, *What do you want to do?*. Click the link **Change the number of files that appear in the list of recently used files**. The related section of the article is displayed.

QUICK TIP

To reposition the Help dialog box, drag the title bar. You can also resize the dialog box by dragging one of the borders.

WARNING

When you drag a dialog box or an application window to the very top of the screen, the dialog box or the window is automatically maximized. If the dialog box becomes maximized as you try to reposition it, click the Restore Down button and then try repositioning it again. You can drag the dialog box as far to the right as desired; just do not drag the title bar to the very top of the screen.

5. If necessary, in the upper-right corner of the Help pane, click the **Keep Help On Top** button  . The feature is toggled on when the pin is pointing downward.
6. Click anywhere in the Word document window. Read and follow the four steps in the Help dialog box. Reposition and/or resize the Help dialog box as needed so you can see the options in the Word Options dialog box.
7. After you complete the fourth step, click the **Close** button to close the Word Help dialog box. Then close Word.

SUMMARY

In this lesson, you learned:

- You can start an Office application by selecting the application on the Start screen, using a shortcut button on the desktop, or opening a file through File Explorer.
- Common elements found in Office application windows include the taskbar, title bar, scroll bars, and status bar.
- You can maximize the space for the document window by minimizing the Ribbon.
- You can customize the Quick Access Toolbar by adding or removing command buttons.
- Backstage view provides quick access to common tasks for managing documents, such as opening, closing, saving, and printing.
- The Open dialog box enables you to open a file from any available disk and folder.
- Problems opening files can involve corrupted data or file compatibility issues, such as trying to open a file in a different application, in an earlier version of an application, or in an operating system other than that used to create it.
- When saving a document, you can choose the location where the file will be saved, assign a new filename, and choose a file format.
- There are multiple ways to close a document and an application. Sometimes, when only one document is open in an application, the application closes when you close the document.
- Several sources of help are available including application Help features, assistance from others, books and manuals, and online support.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The Ribbon changes commands and options to meet your needs as you work in a document.

T F 2. All computer files are saved in folders.

T F 3. You can open multiple applications, but you can view only one application at a time.

T F 4. To maximize the screen space for your document, you can minimize the Ribbon.

T F 5. As you scroll through a document, the location of the insertion point also moves.

MULTIPLE CHOICE

Select the best response for the following statements.

1. A _____ is a list of commonly performed commands from the current window.
   A. ScreenTip C. shortcut menu
   B. Jump List D. none of the above
2. The _____ is the main window that serves as the primary interface between the user and the application.
   A. application window C. desktop
   B. document window D. Start screen
3. The Office application you would use to organize, manipulate, and analyze information such as addresses and inventory data is _____.
   A. Access C. Outlook
   B. Excel D. Word
4. The _____ is a blinking vertical line that indicates the location in the document where the new text and data will be entered.
   A. insertion point C. cursor
   B. I-beam D. A or C
5. Filenames cannot include the character _____.
   A. / C. *
   B. ? D. all of the above

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. _____ provides quick access to common tasks for managing documents, such as saving, opening, and printing.
2. A(n) _____ identifies the type of file and is automatically added to the filename when the document is saved.
3. The _____ is the route the operating system uses to locate a document.
4. A(n) _____ is a small window with descriptive text that appears when you position the mouse pointer over a command or control in the application window.
5. A button for each open application appears on the _____ at the bottom of the screen.
6. To hide the application window without exiting the application, click the _____ button in the upper-right corner of the window.
7. A(n) _____ is a collection of links that provides quick access to files and data.
8. A folder stored within another folder is referred to as a(n) _____.
9. _____ is the ability to open and work with files without a format conflict.
10. To save the document in a new location with a new filename, use the _____ command in Backstage view.

PROJECTS

PROJECT 11–1

2-1.1.1
2-1.1.6
2-1.1.7
2-1.3.1
2-1.3.3
2-1.3.4
2-1.3.6

1. Start Word and create a new blank document.
2. Start PowerPoint and create a new blank presentation. Restore down the application window, and then maximize the window.
3. Create a desktop shortcut to start Excel. Then use the shortcut to open Excel. Create a new blank workbook.
4. Drag and drop buttons on the taskbar to arrange them in the following order from left to right: Word button, Excel button, PowerPoint button. Do not change the order of any other buttons on the taskbar.
5. Switch to the Word document.
6. Use the Word Options dialog box to add the Spelling & Grammar command button to the Quick Access Toolbar.
7. Display the keyboard shortcuts on the Ribbon. Use the keyboard shortcut to display the References tab. Then turn off the display of keyboard shortcuts on the Ribbon.
8. Minimize the Ribbon, and then restore it to its original display.
9. Remove the Spelling & Grammar command button from the Quick Access Toolbar.
10. Close the Word document, but leave the Word application running.
11. Close the PowerPoint presentation and application.
12. Close the Excel workbook and application.
13. Delete the Excel shortcut button on the desktop.
14. Minimize the Word application and then use the Word button on the taskbar to close the application.

PROJECT 11–2

2-1.3.1
2-1.3.2
2-1.3.3
2-1.3.6

1. Start Word and create a new blank document.
2. Use the Open command in Backstage view to navigate to the disk and folder where your Data Files folder is stored. Open the **3Rs.docx** document.
3. Use the Save As command in Backstage view to save the document in a new location with a new filename. Navigate to the disk and folder where your Solutions folder is stored. Change the filename to **Final 3Rs**, followed by your initials. Change the file type to **Word 97–2003 Document (*.doc)**.
4. Start Excel and create a new blank workbook. Use the Open command in Backstage view to navigate to the disk and folder where your Data Files folder is stored. Open the **Lesson 11** folder, and then open the **Marketing** folder. Open the **Marketing Data.xlsx** document.
5. Use File Explorer to navigate to the disk and folder where your Data Files folder is stored. Open the **The 3Rs.pptx** presentation, which will open the PowerPoint application. Also, open the **Marketing Report.docx** document, which is stored in the Marketing subfolder.
6. View all the open documents by cascading the windows. Then undo the cascaded layout.
7. Use the Word button on the taskbar to switch to the **Marketing Report** document. Use the Save As command in Backstage view to save the document in a new location with a new filename. Navigate to the disk and folder where your Solutions folder is stored. Change the filename to **Marketing Report Outline**, followed by your initials. Keep the default file format setting.
8. Use the scroll bar tools to move down in the document to view the remaining content on the page.
9. Close the Marketing Report Outline document. Then close the remaining open document and the Word application. Close the open PowerPoint file and the application.
10. Close the File Explorer window.
11. Close the open Excel workbook and the application.

PROJECT 11–3

2-1.1.1
2-1.1.7
2-1.1.8
2-1.3.1
2-1.3.3
2-1.3.5

1. Start Word and create a new blank document. You will need Internet access to complete the steps in this project.
2. To learn more about using a touchscreen, open the Word Help dialog box by pressing the keyboard shortcut. (*Hint*: The keyboard shortcut appears in the ScreenTip.) Search for the keywords **touchscreen**. In the list of results for the search, click the link **Office 2013 Touch Guide**. Under *BASICS*, click each of the four links to view brief videos demonstrating how to use the touchscreen.
3. Close the Word Help dialog box, and then close the Word application.

TEAMWORK PROJECT

2-1.1.8
2-1.3.1
2-1.3.2
2-1.3.3
2-1.3.5

Your supervisor has decided to assign some projects to staff teams, and he has asked you and a coworker to investigate what features Word, PowerPoint, Excel and Access offer for collaborative work. Working in pairs, complete the following tasks:

1. Interview individuals you know who use Access, Excel, PowerPoint, and Word and ask these individuals how they share documents with others, either for work or for personal use.
2. Using the Help feature in Access, Excel, PowerPoint, and Word, search for the keyword **collaboration** to get information about features that enable more than one person to work on a document.
3. Browse the Office.com Web site to explore features in the four applications that enable collaboration.
4. Create a new Word document, and save the document as **TP 11–1**, followed by your initials.
5. Make a list of the features in each application that help individuals collaborate in developing documents.
6. Save the changes to the document, and then close the document.

CRITICAL THINKING

CRITICAL THINKING 11–1

2-1.3.1
2-1.3.2
2-1.3.3

You and a classmate are working on a team project. Your partner, Jeremy, created an Excel spreadsheet to organize the project data. To share the document, Jeremy saved the file on SkyDrive. You are having trouble locating the file.

1. Create a new Word document, and save the document as **CT 11–1**, followed by your initials.
2. Write a brief summary describing how you would troubleshoot the problem.
3. Save the changes to the document, and then close the document.

CRITICAL THINKING 11–2

2-1.3.1
2-1.3.2
2-1.3.3
2-1.3.6

The Quick Access Toolbar is available in most Office applications, but does it look the same in each application?

1. Open blank documents in Access, Excel, PowerPoint, and Word.
2. Stack the windows so you can see the Ribbons in each application window.
3. Create a new Word document, and save the document as **CT 11–2**, followed by your initials.
4. Create a list of the similarities and the differences you see in the Quick Access Toolbars and the tabs on the Ribbons.
5. Save the changes to the document, and then close the document.
6. Undo the stacked layout of the application windows, and then close each of the open applications.

ONLINE DISCOVERY

At the beginning of this lesson, Table 11–1 provides a brief overview of the Office 2013 applications. Microsoft offers several more Office-related products, which are primarily used by businesses and organizations. Browse *www.office.com* to learn about other Office-related products that are available.

1. Create a new Word document, and save the document as **OD 11–1**, followed by your initials.
2. Create a list of these other Office-related products, and include a brief description and explanation of the purpose of each product.
3. Save the changes to the document, and then close the document.

IC3
2-1.3.1
2-1.3.2
2-1.3.3

JOB SKILLS

In exchange for free lessons, you have agreed to help the owner of a local water ski school with a number of computer-related tasks. The owner has created the following list of tasks she needs to have completed:

a. Schedule lessons for clients.
b. Prepare two marketing documents: a presentation to be published online and a brochure to be printed.
c. Add contact information about clients.
d. Calculate expenses for running the ski school and income from clients.
e. Write letters and e-mails to clients to inform them about special offers and remind them about upcoming scheduled lessons.

1. Create a new Word document and save the document as **JS 11–1**, followed by your initials.
2. Create a list A through E and write the name of the application(s) you would use to complete each of the tasks described in the list above.
3. Save the changes to the document, and then close the document.

IC3
2-1.3.1
2-1.3.2
2-1.3.3

EXPLORE AND SOLVE

As you learned in this lesson, clicking an application button enables you to quickly switch to a different application. If you use a particular application often, instead of using the Start screen or Start menu to open the application, it would be convenient to be able to open the application from the taskbar. Explore the options to pin an application to the taskbar. Also explore how to remove the application from the taskbar. If you practice pinning the application to the task bar, make sure you remove it from the taskbar.

1. Create a new Word document and save the document as **ES 11–1**, followed by your initials.
2. Write a brief paragraph describing how to add an application to the taskbar.
3. Save the changes to the document, and then close the document.

IC3
2-1.1.7
2-1.3.1
2-1.3.2
2-1.3.3



Estimated Time:
1.5 hours

LESSON 12

Getting Started with Word Essentials

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Create a new document.
- Change Word settings.
- Enter text in a document.
- Show nonprinting characters in a document.
- Use the click-and-type setting.
- Change views and magnification in the document window.
- Navigate through a document.

DATA FILES

To complete this lesson, you will need these data files:

Debate.docx
Interview.docx
The Ruts.docx

WORDS TO KNOW

default
Normal.dotm template
toggle
word wrap

Microsoft product screenshots used with permission from Microsoft Corporation.

Word is a powerful, full-featured word-processing application. You can use Word to create letters, reports, tables, memos, faxes, blogs, and much more. The Word lessons in this course will introduce you to the commonly used features that enable you to prepare documents efficiently. You will also learn how to change the way the document looks on the screen and how to navigate through a document.

Creating a New Document

VOCABULARY
default
Normal.dotm template

When you first start the Word application and create a new blank document, the new document is automatically titled Document1. The blank document is formatted with ***default*** settings, which are the preset options or variables automatically in effect when the document is created. The default settings for Word documents are stored in the ***Normal.dotm template***, a file containing default styles and customizations that determine the structure and page layout of a document. Using the Normal.dotm template greatly increases the speed and efficiency of your work as you do not need to spend time setting up the details of the document formats. Information about overriding the default settings and changing document formats is provided in Lessons 13 and 16.

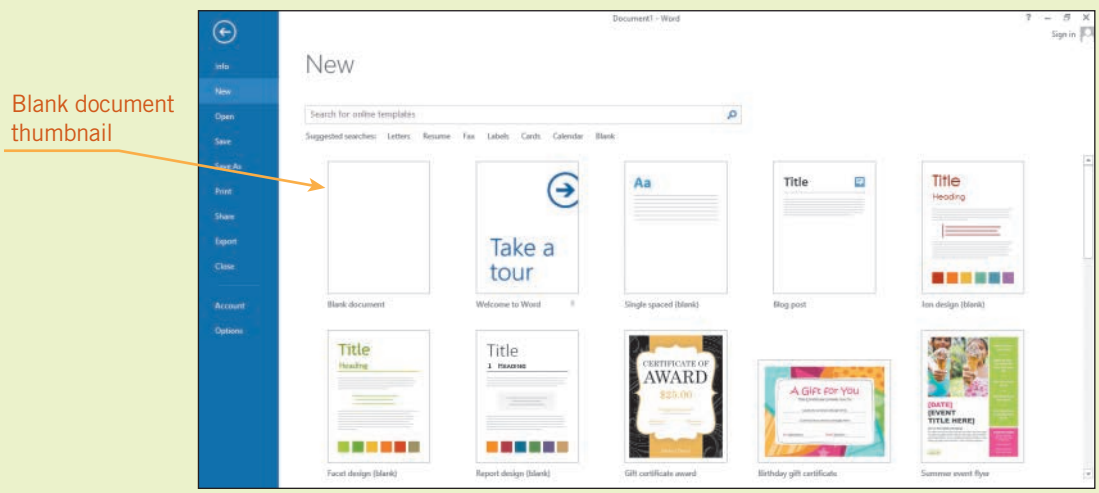
You can open additional documents on top of Document1. All new blank document filenames will be numbered sequentially during the session when Word is open. The filenames for each open document stay the same until you assign a new filename. When the Word application is closed and then restarted, the new blank document filenames begin again with Document1.

Step-by-Step 12.1

IC3 2-1.3.3

1. Start **Word** and create a new blank document. The new document is based on the Normal.dotm template. Notice that the document title bar shows *Document1*. (If Word was already started when you began this exercise, the document number might be higher than the number 1.)
2. Click the **FILE** tab to display the Backstage view options, and then click the **New** command. The Template gallery options may vary, but the Blank document thumbnail should appear first in the gallery as shown in **Figure 12–1**.

FIGURE 12–1
Template gallery in Backstage view



3. Click the **Blank document** thumbnail. A new document based on the Normal.dotm template opens. Notice that the document title bar shows *Document2*. (The number in the filename will be one number higher than the number in the previous filename.)
4. In the upper-right corner of the application window, click the **Close** button to close the current document, which is *Document2*.
5. Leave the other blank document (*Document1*) open for the next Step-by-Step.

Changing Word Settings

As you work with Word, you will begin to recognize "behind the scenes" application settings that are designed to protect your work and improve your efficiency. For example, the default format for saving a document is the XML format that compresses the file size and allows you to open files, even if a component within the file is damaged or corrupted. If desired, you can change the setting and save the file in a different format.

If you have ever experienced your computer locking up or shutting down while you are working with a document, you may have had the opportunity to recover one or more of your documents upon restarting the application. This is because there is a setting to schedule an automatic save of the document information as you work with the document. You can easily customize a setting like this to fit your preferences and meet your needs.

WORKPLACE READINESS

Initiative Is Essential to Success

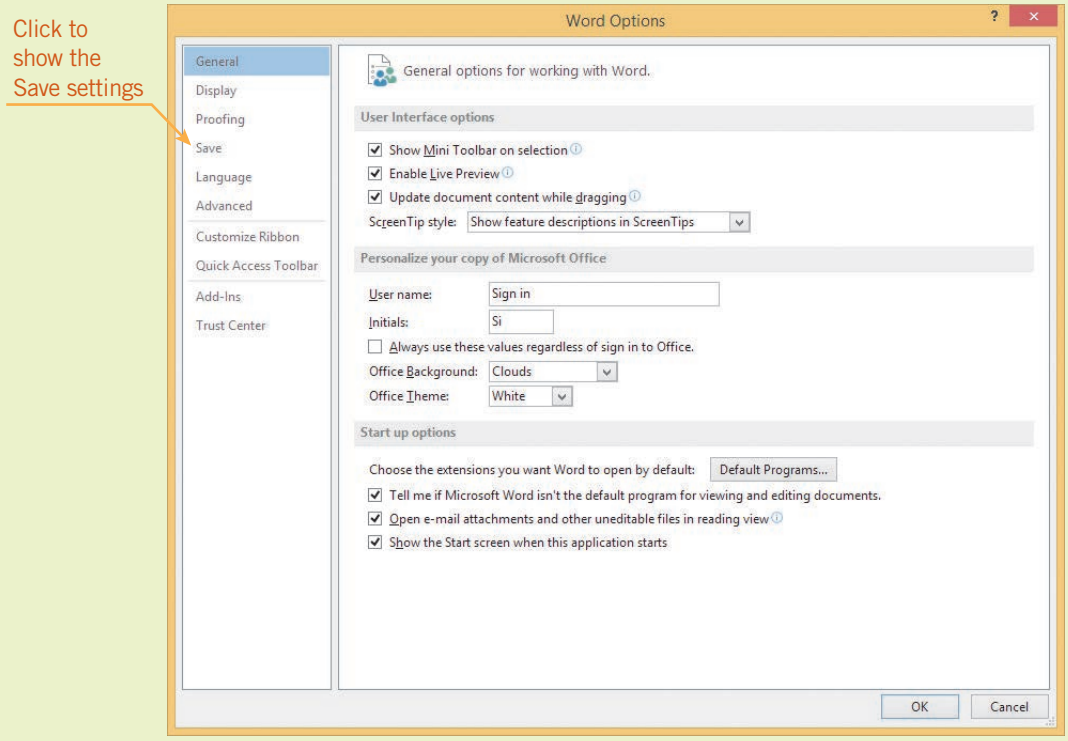
Are you optimistic and upbeat? Do you generate good energy and good will? Do you perform tasks that need to be completed without being asked? Demonstrating initiative is essential for success. Individuals with strong initiative do not just accept the status quo. They adapt to new situations, and they seek new and challenging work. You can confirm your commitment by taking ownership of your tasks and handling responsibilities with minimum direction and supervision.

Step-by-Step 12.2

2-1.1.7

1. If necessary, start **Word** and create a new blank document.
2. Click the **FILE** tab. In the left pane, click **Options**. The Word Options dialog box shown in **Figure 12–2** opens.

FIGURE 12–2
Word Options dialog box



3. In the left pane, click **Save** to review the Save settings, as shown in **Figure 12–3**. Note the file format that is currently selected under *Save documents*. Note that the current setting in the *Save file in this format* box displays the file extension *.docx,* indicating the XML format.

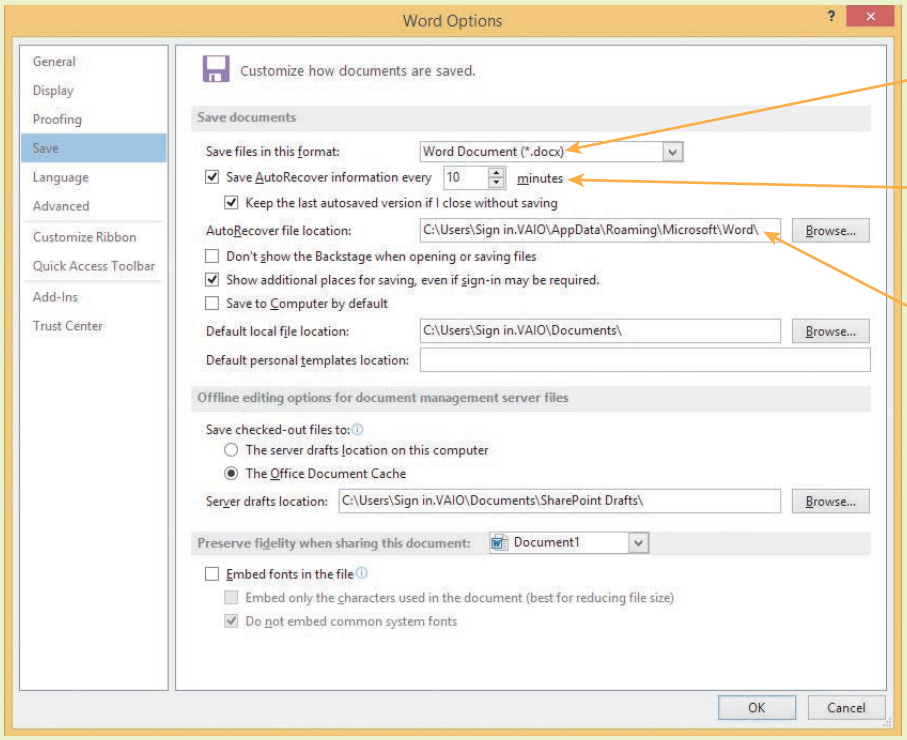


FIGURE 12–3
Save settings in Word Options dialog box

4. Click the **Save files in this format** list arrow to view the available settings, but do not make any changes. Then click the **Save files in this format** list arrow again to hide the list.
5. Notice there is a setting for saving AutoRecover information. The default setting is every 10 minutes, but your setting may be different. Do not make any changes to this setting.
6. Make note of the setting in the Default local file location box. To change this setting, you would click Browse and identify a new path. Do not make any changes to this setting.
7. In the lower-right corner of the dialog box, click **Cancel** to close the dialog box without changing any of the settings.
8. Leave the document open for the next Step-by-Step.

ABOVE AND BEYOND

Users of previous versions of Word prior to Word 2010 are unable to open files saved in the new format, unless they have installed compatibility software. If you often share your documents with users working with previous versions of Word, you should consider changing the file format setting so all documents are saved in the Word 97–2003 (*.doc) format. The drawback to this is that some of the new Word 2013 features are inaccessible in such a document.

Inserting Text and Numbers into a Document

As you enter text in a Word document, the insertion point moves to the right, and the information on the left side of the status bar at the bottom of the document window changes to reflect the page number for the current position of the insertion point. The information on the status bar is continually updated to show the current total number of words in the document.

Entering Text in a Document

As you add text to the document, you may see a red or green wavy line under some of the words. Using the default settings, Word automatically checks the spelling and grammar in a document as you are entering the text, and the wavy lines suggest there may be spelling or grammar errors. If you see any wavy lines while entering text in this lesson, ignore them. You will learn more about the spelling and grammar features in Lesson 13.

If the text you are entering extends beyond the right margin, Word will automatically wrap the text to the next line. This feature is called ***word wrap***. When you press Enter to start a new line in the document, you create a new paragraph. In a document based on the Normal.dotm template, Word automatically adds extra space after each paragraph, so you do not need to press Enter a second time to create a blank space between paragraphs. The extra space after a paragraph makes the document easier to read. Extra space is also added between the lines within a paragraph. You can use the Tab key to indent the first line of a paragraph.

VOCABULARY
word wrap

Step-by-Step 12.3

IC3
2-1.3.2
2-1.3.3
2-2.2.3

1. If necessary, start **Word** and create a new blank document.
2. Press **Tab** and then type the sentence below shown in bold. Notice as you enter the text that the insertion point moves in the document window, and when the text expands to the right side of the screen, the text automatically wraps to the next line and blank space is created between the lines.

   Today, the majority of the American population lives in cities and suburbs. For both recreation and contact with nature, people who live in metropolitan areas depend on parks and recreational paths close to their homes.
3. Note that the status bar reflects the number of words in the document, as shown in **Figure 12–4**. Also, if the proofing icon shows a checkmark, there are no potential errors cited.

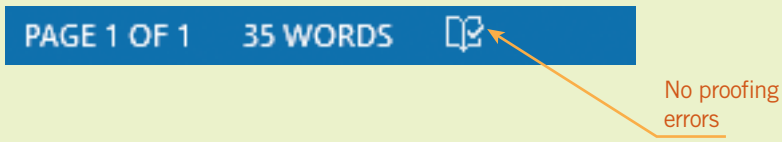


FIGURE 12–4
Information provided in the status bar

4. Press **Enter** to start a new paragraph. Note that extra space is added between the existing paragraph and the new location of the insertion point.
5. Press **Tab** and then type the sentence below.

   Greenways connect parks surrounding and running through metropolitan areas. Sometimes these greenways even link cities together.

6. Click the **FILE** tab, and then click the **Save As** command. In the left pane, click **Computer**. In the right pane, click **Browse**. The Save As dialog box, similar to the one shown in **Figure 12–5**, opens. Compare the folder structure at the top of the dialog box to the default file location setting that you noted in Step 6 in Step-by-Step 12.2. The path displayed at the top of the Save As dialog box may not be the default file location setting because the path in the dialog box will show the last folder into which a Word file was saved.

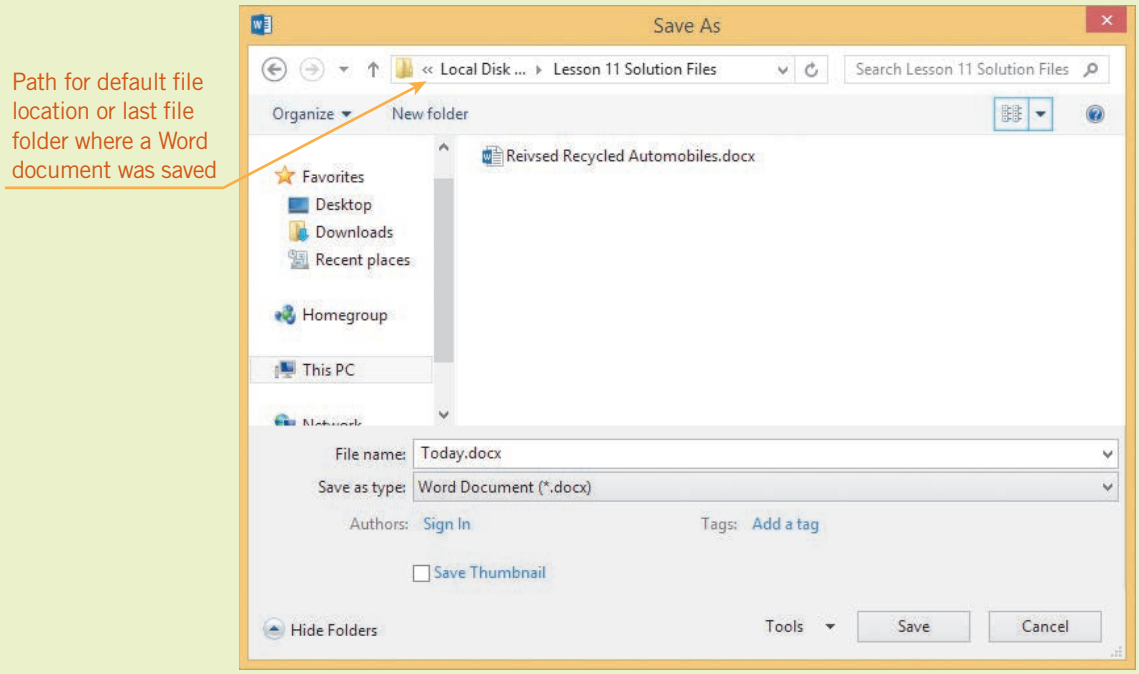


FIGURE 12–5
Save As dialog box

7. Navigate to the drive and folder where you are to save your solutions. (Your instructor will provide this information.)
8. In the File name box, replace the existing text with **Greenways 1**, followed by your initials. Confirm that the Save as type setting is the Word Document (*.docx) format. Then click **Save**.
9. Check the word count in the status bar at the bottom-left corner of the window. The total word count should be *51*.
10. Leave the document open for the next Step-by-Step.

Showing Characters and Using Click and Type

As you have learned, changing the way a document looks on the screen can make tasks easier. To make editing a document easier, you can also show some special characters. These characters are known as nonprinting characters because, although you can show these symbols on the screen, they do not print.

VOCABULARY
toggle

On the HOME tab in the Paragraph group, the Show/Hide ¶ button enables you to ***toggle*** the option to show these nonprinting characters. When you toggle an option, you alternate between the off and on states by repeating a procedure, such as clicking a button. Nonprinting characters include paragraph markers, blank spaces, page or section breaks, and tab markers. Initially, you may not like showing nonprinting characters while you work with a document, but give it a try. Once you get used to seeing the nonprinting characters on the screen, you will find them very useful as you create and edit the document.

Click and type is a Word setting that enables you to quickly position the insertion point within a blank area of a document. When you double-click in a blank space in the document, Word automatically adds the necessary blank paragraphs or tabs to position the insertion point where you click. Showing the nonprinting characters can be very helpful when using click and type. When you reposition the insertion point in a blank area of the document, new nonprinting paragraph markers and tab markers indicate how many blank paragraphs or tabs were created to move the insertion point to the new location.

Step-by-Step 12.4

IC3
2-1.1.3
2-1.1.7
2-1.3.1
2-1.3.2

1. If necessary, open the **Greenways 1** document from your solution files. Save the Greenways 1 document as **Greenways 2**, followed by your initials.
2. On the HOME tab, in the Paragraph group, click the **Show/Hide ¶** button ¶ to toggle the feature on. When toggled on, the button will have a blue background.
3. Compare your document to **Figure 12–6**. The nonprinting symbols are identified in the figure. If necessary, scroll up in the document to see the symbols. If you do not see the nonprinting characters on your screen, click the **Show/Hide ¶** button again.

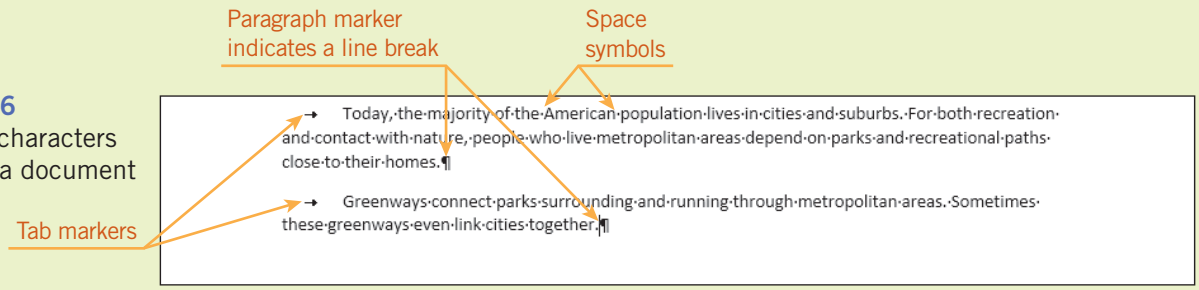


FIGURE 12–6
Nonprinting characters displayed in a document

4. Make sure that the click-and-type setting is enabled:
   a. Click the **FILE** tab to open Backstage view.
   b. Click the **Options** command to open the Word Options dialog box.
   c. In the left pane, click **Advanced**.
   d. In the right pane, below *Editing options*, make sure there is a check mark in the *Enable click and type* box. The option is turned on when there is a check mark in the check box, as shown in **Figure 12–7**.

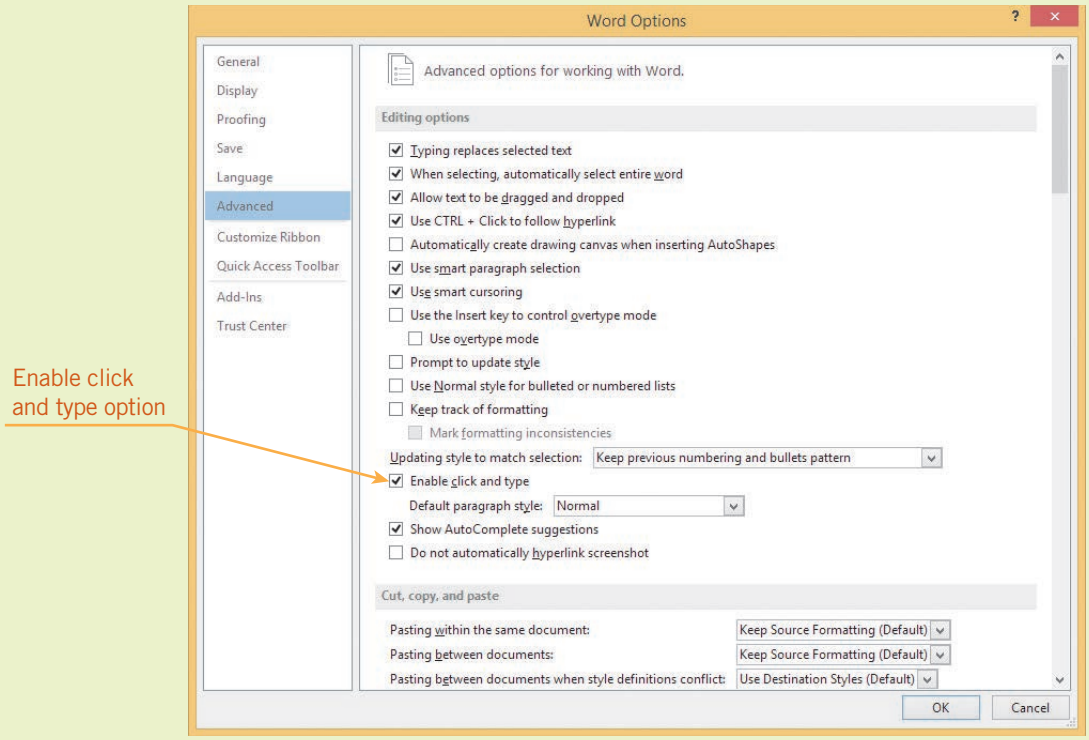


FIGURE 12–7
Advanced settings in the Word Options dialog box

5. Click **OK** to apply the settings and close the Word Options dialog box.
6. Use the scroll bar to move to the bottom of the document. All or most of the document window will be white. Point to the middle of the white area in the document window. The mouse pointer changes to an I-beam, indicating text can be entered in that area of the document. The I-beam is shown in **Figure 12–8**.

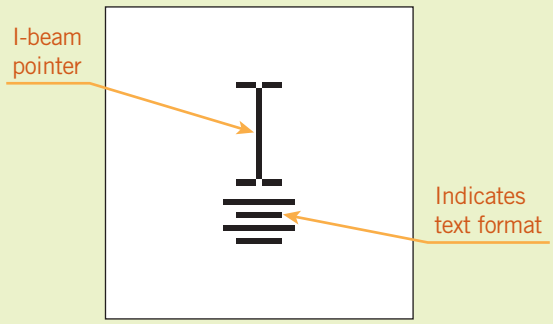


FIGURE 12–8
I-beam in a blank area of the document

ABOVE AND BEYOND

If a graphic is visible next to the I-beam, it indicates the format for the text. For example, the I-beam shown in Figure 12–8 indicates that the text will be aligned at the center, beginning where you positioned the insertion point. You will learn more about text alignment in Lesson 13.

7. With the mouse pointer positioned in the white area, double-click. The insertion point is now positioned where you clicked. Several new paragraph markers will appear above the new location of the insertion point, as shown in **Figure 12–9**.

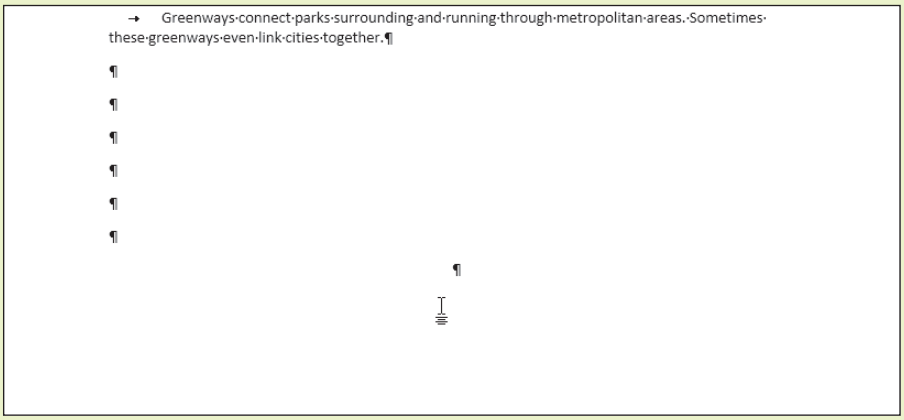


FIGURE 12–9
Nonprinting characters after using click and type

QUICK TIP

When entering numbers in a document, you can use the numbers in the top row on the keyboard or you can use the numbers on the number keypad. If the numbers are not displayed on the screen when you use the keypad, press the Num Lock key on the keypad.

8. Press **Enter**, and then type your first and last names. Press **Enter**, and then type the current date using the mm/dd/yyyy format.
9. On the Quick Access Toolbar, click the **Save** button.
10. Close the document and the Word application.

Changing Views and Magnification

Changing the way the document looks on your screen can make working with the document much easier. You can change the way you view your document, and you can also change the magnification to control how much of the document is shown on the screen. The appearance of the document on the screen should be appropriate for the current task.

Changing the Document View

Word offers different options for viewing a document. Each view provides a different way to look at and work with a document. **Table 12–1** describes each of the views. As you work with documents in the different views, you may find that you prefer one view for certain tasks and another view for other tasks.

When you create a new document, the document opens in Print Layout view. You can change the view by selecting options from the Views group on the VIEW tab. You can also change the view by clicking one of the view buttons in the status bar in the lower- right corner of the application window. Saved documents will open in Read Mode, Print Layout, or Web Layout view, whichever view was most recently displayed.

TABLE 12–1 View options for Word documents

VIEW	DESCRIPTION
Read Mode	The screen space is maximized for reading the document. Using the default settings, two pages are shown side by side as though you are reading a book. You can change the settings to change the column width, page color, and layout. Read Mode is often referred to as Protected mode because most editing functions are disabled to provide protection from potentially malicious software.
Print Layout	The document is displayed on the screen as it will appear when printed. This is the default view setting.
Web Layout	The document is shown on the screen as it will appear in a Web browser.
Outline	The document content is shown on the screen in an outline format, which makes it easy to see the structure of the document and to quickly and easily reorganize the content.
Draft	Only the basic document, without elements such as headers and footers, is shown on the screen. The purpose of Draft view is to make the editing process quicker.

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Step-by-Step 12.5

IC3
2-1.3.1
2-1.3.2
2-1.3.6

1. Start **Word**. In the navigation bar, click **Open Other Documents**. Navigate to the drive and folder where your Data Files folder is stored and open the **The Ruts** document. Save the **The Ruts** document as **Getting Through the Ruts 1**, followed by your initials.
2. On the Ribbon, click the **VIEW** tab. The Ribbon adapts to show the groups shown in **Figure 12–10**. In the Views group, the blue background behind the Print Layout button indicates that view is enabled. The document is currently displayed in Print Layout view.

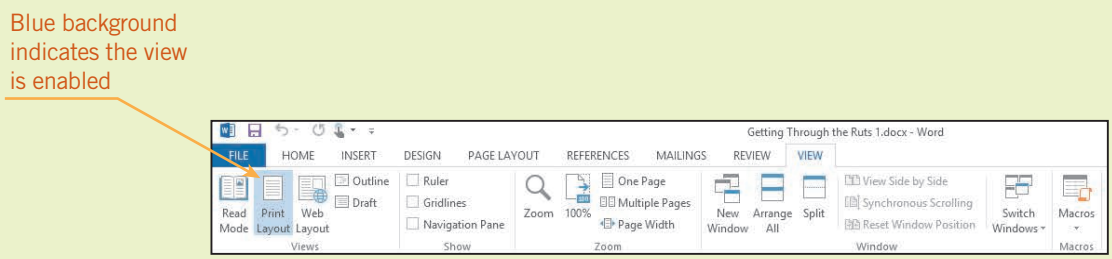


FIGURE 12–10 VIEW tab on the Ribbon

3. In the Views group, click the **Read Mode** button. The document displays full screen. **Figure 12–11** shows the pages are displayed as they would appear in a book, two pages side by side. Your screen may show a single column. In Read Mode, the Ribbon is reduced to a Reading toolbar.

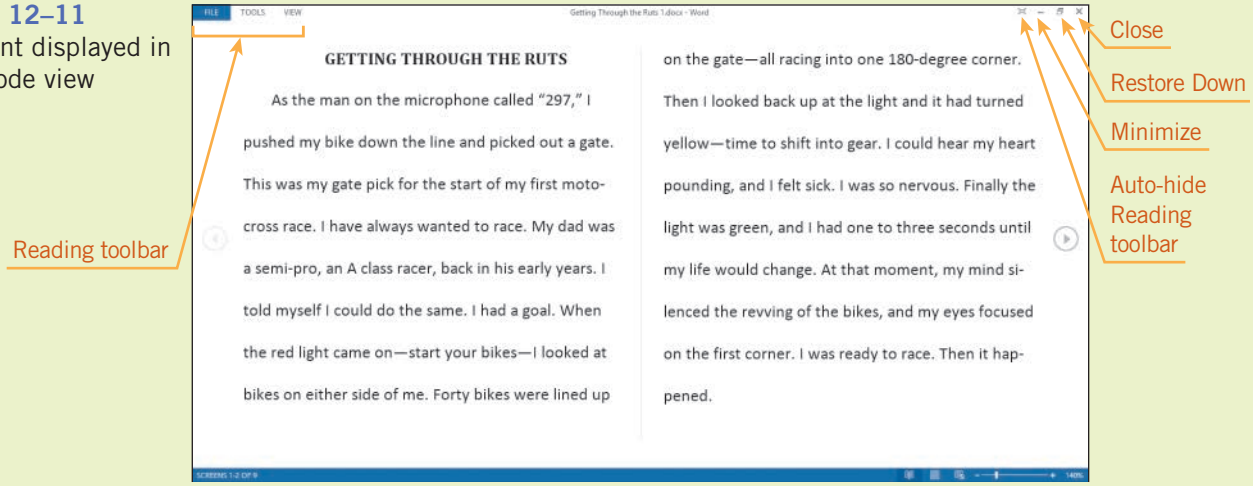


FIGURE 12–11
Document displayed in Read Mode view

4. If your screen shows a single column, you can use the Layout option in the VIEW menu to show the pages side-by-side. In the upper-left corner of the screen, on the Reading toolbar, click **VIEW** to display the VIEW menu shown in **Figure 12–12**. If an option is highlighted, the option is already enabled. To explore some options to customize the Read Mode view, perform the following:
   a. On the VIEW menu, click **Column Width**. On the submenu, click **Wide**. The two-column format changes to a one-column format. Click the **VIEW** button to open the menu again, click **Column Width**, and then click **Narrow**.
   b. Open the VIEW menu again. Click **Page Color**, and then on the submenu click **Inverse**. The page displays white text on a black background. Open the VIEW menu again, click **Page Color**, and then click **None**.
   c. Reopen the VIEW menu, click **Layout**, and then click **Paper Layout**. The view is similar to Print Layout view, without the Ribbon. Reopen the VIEW menu, click **Layout**, and then click **Column Layout**.

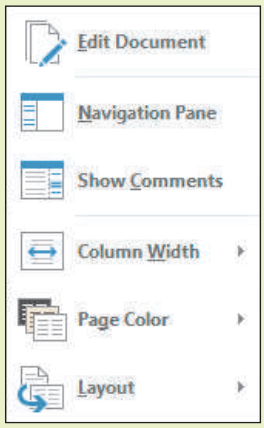


FIGURE 12–12
VIEW menu in Read Mode view

5. To scroll through the pages in Read Mode view, do one or more of the following:
   a. Click the **arrow** buttons that appear on the right and left sides of the screen.
   b. If your mouse has a wheel, move the scroll wheel on the mouse.
   c. If you have a touch screen, swipe the screen from right to left to move through the pages, or tap the **arrow** buttons on the left and right sides of the screen to move one page at a time.
   d. Press the **up** and **down** and **left** and **right** arrow keys or the **Page Down** and **Page Up** keys.
6. On the Reading toolbar, click **VIEW** and then click **Edit Document**. The Ribbon now displays at the top of the document, and the highlighted button in the Views group on the Ribbon (and the highlighted button on the status bar) indicates the document is once again displayed in Print Layout view.
7. On the lower-right corner of the status bar, click the **Web Layout** button. See **Figure 12–13**. The document displays as it would display if uploaded to a Web page, and a dark blue background on the Web Layout button on the status bar indicates the current view.

QUICK TIP

To use the arrow keys, the Page Up and Page Down keys, and the Home and End keys on the number pad, you must toggle the Num Lock off.

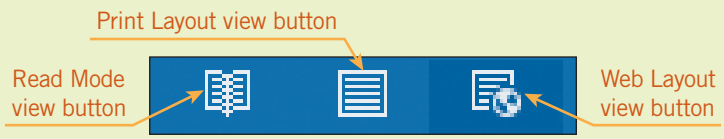


FIGURE 12–13
View buttons on the status bar

8. In the Views group on the VIEW tab, click the **Outline** button. Notice that the Ribbon now displays the OUTLINING tab with tools for navigating and editing the document outline. You will have an opportunity to work in Outline view in Lesson 16. In the Close group, click the **Close Outline View** button.
9. Click the **VIEW** tab, and then in the Views group, click the **Draft** button. The white space for the top and left margins is no longer displayed, and the text wrapping changes.

10. On the status bar, click the **Read Mode** button. Then press **Esc** to switch to Print Layout view. Save the changes and leave the document open for the next Step-by-Step.

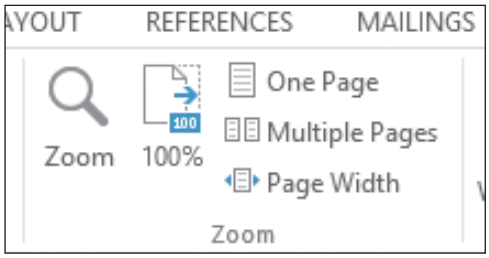
Changing the Zoom Settings

Zoom options enable you to increase and decrease the size of text and graphics on the screen. You can also show an entire page or multiple pages at the same time. When you open a new document or a saved document, the document window is displayed with the default zoom setting for the current document view. The default settings vary because of the screen size, the screen resolution settings, and the panes displayed on the screen.

You can easily change the zoom settings using options in the Zoom group on the VIEW tab, which is shown in **Figure 12–14**. You will also find zoom controls on the right side of the status bar at the bottom of the document window. If your mouse has a scroll wheel, you can use the mouse to zoom in and out.

View and zoom settings are saved with a document, and usually when you open a document, it is displayed in the view and zoom setting in which it was last viewed, with two exceptions. If the document was last viewed in either Outline or Draft view, the document will reopen in Print Layout view.

FIGURE 12–14
Zoom group on the VIEW tab



Step-by-Step 12.6

IC3
2-1.3.2
2-1.3.6

1. If necessary, open the **Getting Through the Ruts 1** document from your solution files. Save the **Getting Through the Ruts 1** document as **Getting Through the Ruts 2**, followed by your initials.
2. If necessary, click the **VIEW** tab on the Ribbon, and change the document view to **Print Layout**.

3. In the Zoom group on the VIEW tab, click the **Zoom** button to open the Zoom dialog box shown in **Figure 12–15**. The Zoom dialog box provides a Preview screen and a text preview panel in the Zoom dialog box so you can preview how the changes you select will appear on the screen. Note that your Percent setting may differ from the one displayed in Figure 12–15.

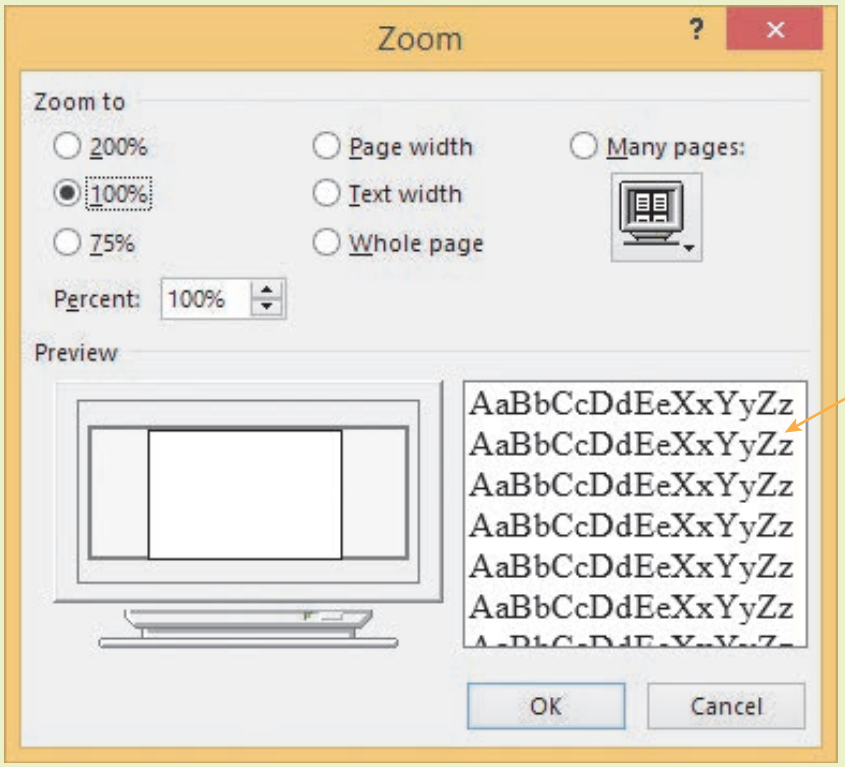


FIGURE 12–15
Zoom dialog box

4. Most likely, the current setting is 100%. Under *Zoom to*, click to enable the **75%** option, and preview that setting. Note, too, that the *Percent* box shows *75%*.
5. In the Zoom dialog box, click to select the **Whole page** option. Notice the percentage changes again.
6. In the Zoom dialog box, click to select the **Many pages** option. The percentage will change to 10%, and you will be able to view all the pages in the document at the same time.
7. Click **OK** to accept the change. All four pages of the document are displayed on your screen.
8. In the Zoom group, click the **Page Width** button. The first page of the document should be displayed on your screen.
9. If your mouse has a scroll wheel, press and hold **Ctrl** and roll the wheel toward you to zoom out. Then press and hold **Ctrl** and roll the wheel away from you to zoom in.

QUICK TIP

To zoom in on objects (such as tables, charts, and images) in Read Mode view, double-click or double-tap the object. To zoom in further, click or tap the icon in the upper-right corner of the object. To zoom out, click or tap outside the object.

10. On the right side of the status bar, at the bottom of the application window, zoom controls are displayed as shown in **Figure 12–16**. Position the mouse pointer over the Zoom Out and Zoom In buttons to display the ScreenTips that describe the buttons. Note the current zoom level percentage displayed to the right of the Zoom In button.

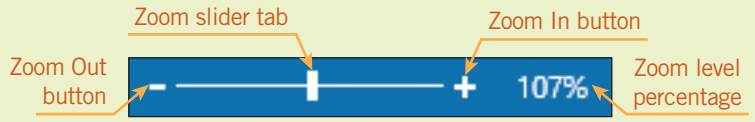


FIGURE 12–16
Zoom controls on the status bar

11. Click the **Zoom Out** button twice. Then click the **Zoom In** button three times. Note the changes in the percentages each time you click the buttons.
12. Drag the **Zoom** slider tab in the middle to the left to approximately 50%. Then drag the **Zoom** slider tab to the right to zoom in to approximately 150%.
13. On the Ribbon, in the Zoom group, click the **100%** button.
14. Leave the document open for the next Step-by-Step.

Navigating Through the Document

There are many ways to save time moving through both long and short Word documents, including using the Navigation Pane, scrolling, and using the Go To command and keyboard shortcuts.

Using the Navigation Pane

When working with long documents, you can easily move through a document by using the Navigation Pane. In the Navigation Pane, you can search for specific text in the document. You can also choose the option to view thumbnails for each page in the document. Each thumbnail is identified with a page number, and the current page is also identified in the status bar. Although most words may be too small to read on a thumbnail, usually graphics or headings will help you identify the page. To go directly to a specific page, click the thumbnail for that page.

Step-by-Step 12.7

1. If necessary, open the **Getting Through the Ruts 2** document from your solution files. If necessary, click the **VIEW** tab.

IC3 2-1.3.5

2. On the VIEW tab, in the Show group, enable the **Navigation Pane** option. The option is enabled when a check mark is displayed in the check box, as shown in **Figure 12–17**. The Navigation Pane is displayed on the left side of the document window.

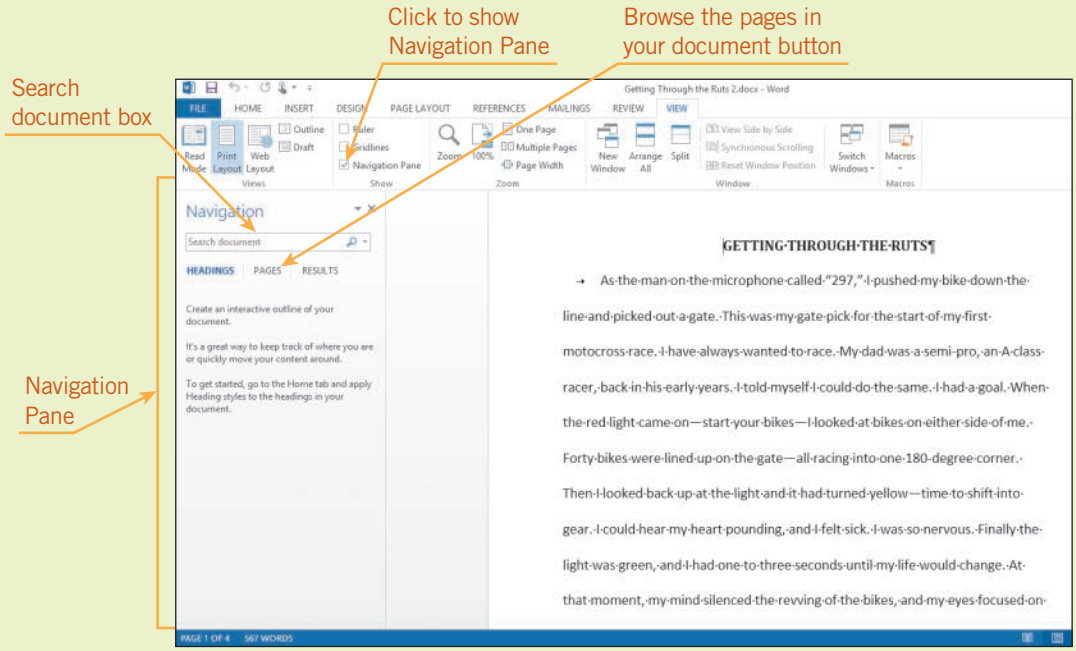


FIGURE 12–17
Navigation Pane

3. Under the *Search document* box at the top of the pane, click **RESULTS** to enable the option to display search results. Then click in the **Search document** box and slowly type **ruts**. As you enter each character, the results are filtered and appear in the Navigation Pane. After entering all four characters, you will see three results as shown in **Figure 12–18**. The search text is highlighted in a portion of the text where the occurrence appears in the document.

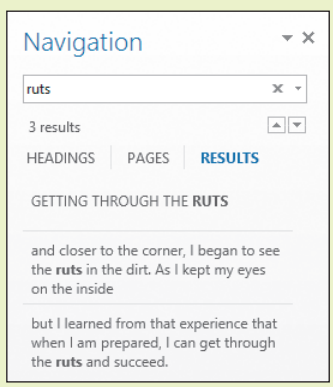


FIGURE 12–18
Search results in the Navigation Pane

4. Click the third result for the search beginning with **but I learned from...**. The insertion point moves to the third occurrence of the word *ruts* at the end of the document.
5. Delete the text in the *Search document* box.
6. Under the *Search document* box, click the **PAGES** option. Four thumbnails are displayed in the Navigation Pane. The page number is shown below the thumbnail.
7. In the Navigation Pane, click the **Page 3** thumbnail. Page 3 is displayed in the document window.
8. In the Navigation Pane, click the **Page 4** thumbnail. Page 4 is displayed in the document window.
9. Leave the document open for the next Step-by-Step.

Scrolling and Using the Go To Command

If the location you want to navigate to is currently on the screen, you can simply position the mouse pointer and click. If the part of the document you want to view is currently not visible, you can use the scroll bars to navigate to that part of the document. The scroll bars enable you to quickly move to other areas of the document. If the zoom settings are set for page width (the default setting) or a smaller percentage, the horizontal scroll bar will not appear because the entire width of the document is already visible.

The position of the scroll box on the scroll bar helps you identify what part of the document you are viewing. As you drag the scroll box, a ScreenTip tells you what page you are viewing. As you learned in Lesson 11, when you scroll through a document, the insertion point does not move. If you scroll to a new part of the document and want to reposition the insertion point on that page, then you just click where you want the insertion point.

When navigating through a multipage document, the Go To command can be very useful, because you can go directly to a specific page, a specific line, or a specific type of content in the document.

When you reopen a document, either in Read Mode or in Print Layout view, Word remembers where you last were in the document when you closed it. To quickly navigate to that location, you can click the Resume Reading callout. Resume Reading works even when you reopen the document from a different computer or other device.

Step-by-Step 12.8

IC3
2-1.3.5
2-1.3.6

1. Open the **Getting Through the Ruts 2** document from your solution files. If necessary, show the **Navigation Pane**, and click the **Page 4** thumbnail. Make sure the **VIEW** tab is displayed.
2. On the VIEW tab, in the Zoom group, click the **Zoom** button to open the Zoom dialog box. Under *Zoom to*, select the **200%** option. Click **OK**. Position the mouse pointer anywhere in the document window. The horizontal scroll bar is displayed as shown in **Figure 12–19**.



FIGURE 12–19
Horizontal scroll bar tools

3. Click the **right** and **left** scroll arrows on the horizontal scroll bar to scroll left and right through the page in the document window. Then drag the **scroll box** on the horizontal scroll bar at the bottom of the screen to the far right side of the scroll bar.
4. In the Zoom group, click the **Page Width** button to reduce the magnification of the document. If your mouse has a wheel, roll the wheel toward you to scroll down. Then roll the wheel away from you to scroll up.
5. Position the mouse pointer over the right border of the document window to show the vertical scroll bar. Use the vertical scroll bar to show the last sentence in the document. Then use the vertical scroll bar to show the beginning of the document. Position the insertion point in front of the first character in the document title.
6. In the Navigation Pane, position the mouse pointer over the right border of the Navigation pane to show the vertical scroll bar. Drag the **scroll box** up and down to scroll through the pages.
7. In the Navigation Pane, click the **down arrow** on the right side of the *Search document* box. On the menu, click **Go To...**. The Go To tab in the Find and Replace dialog box shown in **Figure 12–20** opens.

QUICK TIP

When you use the vertical scroll bar, think about moving up and down several floors in a building. To move up or down one or two floors you would likely take the stairs (click the up and down scroll arrows on the scroll bar). To move up or down several floors, you can save time by taking the elevator (drag the scroll box on the scroll bar).

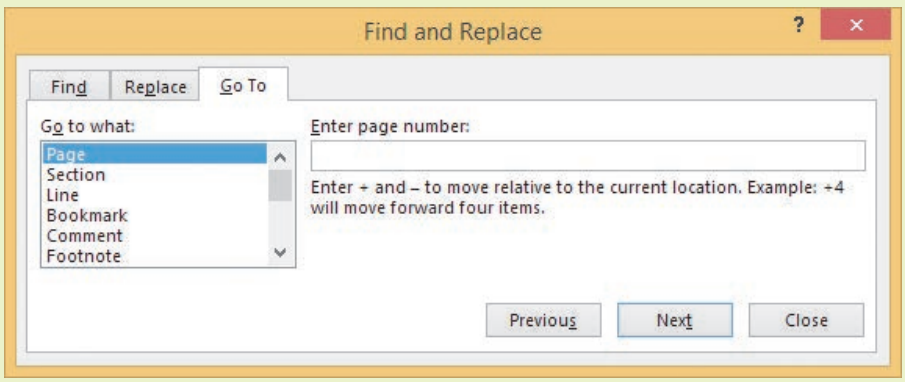


FIGURE 12–20
Go To tab in the Find and Replace dialog box

8. If necessary, under *Go to what*, click **Page** to select the option. Note that the insertion point is blinking in the *Enter page number* box. (If you previously used this command, a selected number may appear in the *Enter page number* box.)

QUICK TIP

You can also open the Go To tab in the Find and Replace dialog box by clicking the Find button arrow in the Editing group on the right side of the HOME tab and then click Go To.... Or, you can quickly access the Go To commands using the keyboard shortcut Ctrl+G.

9. Type **3**. The options at the bottom of the dialog box change. Click **Go To**. The insertion point moves to the top of page 3. In the Navigation Pane, a blue border is displayed on the page 3 thumbnail, indicating it is the current page. The information on the left side of the status bar also indicates you are viewing page 3 of 4.
10. In the Go To tab in the Find and Replace dialog box, under *Go to what*, click **Line**. Then click in the **text box** under *Enter line number*, and type **33**. At the bottom of the dialog box, click **Go To**. The insertion point moves to the beginning of the 33rd line in the document, and the blue border on the page 4 thumbnail in the Navigation pane indicates the insertion point is now positioned on the fourth page. Click **Close** to close the Find and Replace dialog box.
11. Scroll to the end of the document and position the insertion point after the period in the last line of text. Press **Enter**, and type the current date using the *mm/dd/yyyy* format.
12. Click the **Close** button on the upper-right corner of the Navigation Pane to hide the pane. Note the Zoom percentage on the status bar.
13. Save the changes and close the document. Reopen the document. Note that the document is displayed in Print Layout view and the zoom setting percentage is the same as when you closed the document.
14. Click the **Resume Reading callout** on the right side of the document window. Word automatically moves the insertion point to the end of the document, which is where you were when you closed the document. Leave the document open for the next Step-by-Step.

Using the Keyboard

ABOVE AND BEYOND

You can find a comprehensive list of links for information about keyboard shortcuts by searching for the keywords *keyboard shortcuts* in the Word Help dialog box.

If you have good keyboarding skills, using the keyboard to move the insertion point can speed up your navigation. Using the keyboard eliminates the need to move your hand back and forth between the keyboard and the mouse. You can use the arrow keys on the keyboard to move the insertion point one character at a time or one line at a time. If you need to move across several characters or lines, however, using a combination of keys will make the task easier and quicker. **Table 12–2** provides a list of keys and key combinations for moving the insertion point throughout the document.

TABLE 12–2 Keys and key combinations for moving the insertion point

TO MOVE THE INSERTION POINT	PRESS
Right one character	Right arrow
Left one character	Left arrow
Down one line	Down arrow
Up one line	Up arrow
To the end of a line	End
To the beginning of a line	Home
To the next screen	Page Down
To the previous screen	Page Up
To the next word	Ctrl+Right arrow
To the previous word	Ctrl+Left arrow
To the end of the document	Ctrl+End
To the beginning of the document	Ctrl+Home
Down one paragraph	Ctrl+Down arrow
Up one paragraph	Ctrl+Up arrow

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Step-by-Step 12.9

IC3 2-1.1.1 2-1.3.1

1. If necessary, open the **Getting Through the Ruts 2** document from your solution files. Click anywhere in the middle of the current page.
2. Press **Ctrl+End** to move the insertion point to the end of the document. Then press **Ctrl+Home** to move the insertion point to the beginning of the document.
3. Press the **down arrow** key twice to move the insertion point down two lines. Press the **right arrow** key three times to move the insertion point three characters to the right.
4. Press **End** to move the insertion point to the end of the line.
5. Press and hold **Ctrl**, and then press the **left arrow** key to move the insertion point to the beginning of the word *first.* Continue to hold **Ctrl**, and press the **left arrow** key again to move to the previous word *my*.
6. Press **Home** to move the insertion point to the beginning of the line.
7. Press **Page Down** six times to move down six screens.
8. Press and hold **Ctrl**, and then press the **down arrow** key to move down one paragraph.
9. Close the document and exit Word. If prompted to save changes to the document, click **Don't Save**.

SUMMARY

In this lesson, you learned:

- New blank documents are created based on a template with default settings.
- There are many "behind the scenes" settings in Word that can be changed to meet your preferences.
- Word automatically wraps text to the next line when the line of text extends beyond the right margin.
- Showing the nonprinting characters, such as tab markers, blank spaces, page breaks, and paragraph markers can be very useful as you create and edit a document.
- The click and type setting enables you to position the insertion point in a blank area of a document.
- Word provides several options for viewing a document.
- You can use zoom options to increase or decrease the size of the text and graphics on the screen.
- You can search for text and view thumbnails of the document pages in the Navigation Pane to make it easier and faster to navigate through the document.
- You can also use the mouse, the Go To command, and keyboard shortcuts to navigate through a document.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. When you create a new blank Word document, you can choose whether or not to apply the default settings.

T F 2. Zoom options allow you to increase and decrease the size of text and graphics within a document.

T F 3. In the Navigation Pane, you can search for specific text in the document.

T F 4. You can use the Go To command to quickly navigate and move the insertion point to a specific page or line in the document.

T F 5. When you open a saved document, it will always display in Print Layout view.

MULTIPLE CHOICE

Select the best response for the following statements.

1. The information in the _____ continually updates to show the current total number of words in the document.
   - A. title bar
   - B. status bar
   - C. task bar
   - D. Paragraph group on the HOME tab
2. Nonprinting characters include _____.
   - A. paragraph markers and tab marks
   - B. blank spaces
   - C. page and section breaks
   - D. all of the above
3. The _____ view makes the editing process quicker.
   - A. Read Mode
   - B. Draft
   - C. Outline
   - D. Print Layout
4. To change the magnification settings for a document, _____.
   - A. click the Zoom button in the Zoom group on the Ribbon
   - B. use the zoom controls in the status bar
   - C. use the mouse scroll wheel
   - D. any of the above
5. To move the insertion point to the end of the document, press _____.
   - A. End
   - B. Ctrl+Down arrow
   - C. Ctrl+End
   - D. Shift+Down arrow

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is the advantage to using the keyboard to reposition the insertion point in the document?

2. What is displayed in Outline view, and what is the purpose of Outline view?

3. What are the benefits of using the Normal.dotm template when you create a new document?

4. How can you alternate between the off and on states of a procedure, such as showing nonprinting characters?

5. How is the Navigation Pane useful for moving through long documents?

6. How are paragraphs formatted when you use the Normal.dotm template, and why?

7. What filenames does Word automatically apply when you start Word and then create new blank documents?

8. How does the Resume Reading feature save you time navigating through a document?

9. How can you use the Navigation Pane to identify what part of the document you are viewing?

10. What is the benefit of the AutoRecover setting?

PROJECTS

PROJECT 12–1

2-1.3.1
2-1.3.2
2-1.3.3
2-1.3.6

1. If necessary, start **Word**. Create a new blank document.
2. Type the following two paragraphs. Be sure to indent the first line of each paragraph.

Throughout the twentieth century, shifting along the San Andreas Fault in California caused numerous damaging earthquakes. Almost everyone knows about the San Andreas Fault.

Relatively unknown is the New Madrid Fault in the central United States. In the nineteenth century, the New Madrid Fault caused three of the most powerful earthquakes in U.S. history. Damage from the earthquake was reported as far away as Charleston, South Carolina, and Washington, DC. One earthquake along this fault line was so powerful that it caused the Mississippi River to change course.

3. Navigate to your solutions folder, and save the Document as **Earthquakes**, followed by your initials.
4. Switch to **Web Layout** view.
5. Switch to **Read Mode** view and show the Navigation pane.
6. Switch to **Print Layout** view.
7. Position the insertion point at the beginning of the first word in the document, and type **Historic Earthquakes**.
8. Press **Enter** once to create extra space after the new line of text.
9. Change the Zoom Percent setting to **75%**.
10. Save the changes to the document.
11. Close the document, and leave Word open for the next project.

PROJECT 12–2

2-1.1.3
2-1.3.1
2-1.3.2
2-1.3.5
2-1.3.6

1. Open the document **Interview** from the drive and folder where your Data Files folder is stored.
2. Save the Interview document as **Interview Answers**, followed by your initials.
3. Read each of the questions, choose one to answer. Do not type your response yet.
4. Show the nonprinting characters in the document.
5. Scroll down to the middle of the document. Using click and type, position the insertion point on the left side of the page and in the white area about two inches below the last question.
6. Type **Response to Question #*x***. Replace the *x* with the question number you chose in Step 3. Press **Enter** to create a new paragraph. Type your response to the question.
7. There should be at least two blank paragraphs between the last question and the response you typed. If necessary, position the insertion point between the last question and the new text you type, and then press **Enter** to add more blank lines.
8. Use the **Go To** command to move the insertion point to the beginning of the first line in the document. Type **INTERVIEW ANSWERS**, and then press **Enter**.
9. Change the magnification to **Page Width**.
10. Save the changes to the document, and close the document. Leave Word open for the next Project.

PROJECT 12–3

2-1.1.1
2-1.3.1
2-1.3.5

1. Open the **Debate** document from the drive and folder where your Data Files folder is stored.
2. Scroll to the middle of the document until you see the heading *Similarities*.
3. Use keyboard shortcuts to do the following:
   a. Move the insertion point to the end of the document.
   b. Move the insertion point up one paragraph.
   c. Move the insertion point to the end of the line.
   d. Move the insertion point to the previous screen.
   e. Move the insertion point to the beginning of the document.
   f. Move the insertion point down two lines.
4. Use the Go To command to locate line 64. The insertion point should be positioned near the heading *Differences*. Then use the Go To command to locate line 50. The insertion point should then be positioned at the beginning of the heading *Similarities*.
5. If necessary, show the Navigation Pane. Browse the pages in your document and go to page 1. The first page in the document is a cover page, so it is numbered 0.
6. Using the Navigation Pane, move the insertion point to page 4.
7. Close the document. If prompted to save changes, click Don't Save.

TEAMWORK PROJECT

Microsoft released the first version of Word for an IBM PC in 1983. The early versions of Word were created for MS-DOS, not Windows. Word made full use of the mouse, but few people used the mouse at this time. They usually accessed the commands by keystrokes, and users often memorized the necessary keystrokes. So, keyboard shortcuts have been around for a long time. You learned several keyboard shortcuts in this lesson, but there are many more.

Choose a partner to help you find keyboard shortcuts for commands related to the following:

- Displaying and using windows
- Using dialog boxes
- Using the Open and Save As dialog boxes

2-1.1.1
2-1.1.8
2-1.3.1
2-1.3.2
2-1.3.3
2-1.3.6

1. Use the Word Help system to learn about keyboard shortcuts for commands related to the above topics.
2. Try some of the shortcuts described in your list to see if the shortcuts work on your computer.
3. Create a new Word document, and save the document as **TP 12–1**, followed by your initials.
4. List three or four shortcuts that you and your partner will most likely use.
5. Save the changes to the document, and then close the document.
6. Demonstrate those shortcuts to others in the class, providing an explanation as to why you and your partner think the shortcuts are helpful.

CRITICAL THINKING

CRITICAL THINKING 12–1

2-1.3.1
2-1.3.2
2-1.3.3
2-1.3.6

In this lesson you explored several different document views. Which of these views do you prefer?

1. Create a new Word document, and save the document as **CT 12–1**, followed by your initials.
2. Write a paragraph describing your view preference, and explain why.
3. Save the changes to the document, and then close the document.

CRITICAL THINKING 12–2

2-1.1.1
2-1.3.1
2-1.3.2
2-1.3.3

In this lesson you explored several methods to navigate through a document: using the Navigation Pane, scrolling, browsing, and using the keyboard. If you need to navigate to a specific page in a document with 10 pages, which method of navigation would you use?

1. Create a new Word document, and save it as **CT 12–2**, followed by your initials.
2. Write a brief paragraph about which method you prefer, and explain why.
3. Save the changes to the document, and then close the document.

ONLINE DISCOVERY

ONLINE DISCOVERY 12–1

2-1.2.1
2-1.3.2
2-1.3.3
2-1.3.6

In this lesson you explored the options for changing the zoom settings in Word documents. You can also change the zoom settings when you view Web pages. Open your Web browser, and experiment with changing the zoom settings. Compare changing the view of a Web page to changing the view of a Word document.

1. Create a new Word document, and save the document as **OD 12–1**, followed by your initials.
2. Write a brief summary of your findings.
3. Save the changes to the document, and then close the document.

ONLINE DISCOVERY 12–2

2-1.3.1
2-1.3.2
2-1.3.3

The arrangement of a standard keyboard on a computer (or a typewriter) is called QWERTY, referring to the first six characters in the top row of letters. But why are the letters on the keyboard not arranged in alphabetical order, or some other logical order? Why QWERTY?

1. Search the Internet to learn the history of the QWERTY keyboard and the Dvorak keyboard.
2. Create a new Word document, and save the document as **OD 12–2**, followed by your initials.
3. Write a brief summary of your findings. Cite your sources by copying the Web page URL and pasting the information at the bottom of the summary.
4. Save the changes to the document, and then close the document.

JOB SKILLS

When you open a Word document attached to an e-mail, the document most likely opens in Read Mode view as a result of the default settings. In a discussion with your colleagues, you offered to learn how to change this default setting.

1. Open the Word Options dialog box, and review the settings.
2. Create a new Word document, and save the document as **JS 12–1**, followed by your initials.
3. Write a paragraph describing how you can change the setting so Word documents do not open in Read Mode view when opened from an e-mail attachment. (Do not make any changes to the settings on your computer.)
4. Save the changes to the document, and then close the document.

IC3
2-1.1.7
2-1.3.1
2-1.3.2
2-1.3.3

EXPLORE AND SOLVE

Did you know?

- You can change the appearance and size of the mouse pointer.
- You can you change how fast the mouse pointer moves around the screen.
- If your left hand is your dominant hand, you can change the settings so the right mouse button is the primary button and then you can more easily manipulate the mouse with your left hand.

1. Explore the options to make the three changes described in the bulleted list above. (*Hint*: The mouse settings are available for all Office applications, so you can find the answers in the Windows Control Panel.)
2. Create a new Word document, and save the document as **ES 12–1**, followed by your initials.
3. Write a paragraph describing how you can customize the mouse settings described in the bulleted list. (Do not make any changes to the settings on your computer.)
4. Save the changes to the document, and then close the document.

IC3
2-1.1.7
2-1.3.1
2-1.3.2
2-1.3.3



Estimated Time:
2 hours

LESSON 13

Editing and Formatting Documents

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Delete and insert text using the Backspace and Delete keys and Insert and Overtype modes.
- Undo, redo, and repeat actions.
- Edit text using drag-and-drop editing and the Cut, Copy, and Paste commands.
- Find and replace text.
- Use proofing tools to check and correct spelling and grammar.
- Change the character format.
- Format paragraphs with line spacing, alignment, tabs and indents, and bulleted and numbered lists.
- Format document layouts with margin settings, page orientation settings, and page breaks.

DATA FILES

To complete this lesson, you will need these data files:

Balanced Diet.docx
Career Goals.docx
Dietary Energy.docx
Documentaries.docx
Exposition.docx
Fall Schedule.docx
Fitness Goals.docx
Garden.docx
H2O Harbor.docx
Recreation Programs.docx
Viewpoint.docx

WORDS TO KNOW

alignment
Clipboard
drag-and-drop editing
edit
first line indent
font
format
Format Painter
hanging indent
incremental search
indent
landscape orientation
manual line break
manual page break
margins
points
portrait orientation
select
soft page break
wildcard character

Microsoft product screenshots used with permission from Microsoft Corporation.

Editing and formatting features give you the ability to refine your documents and determine how they will look on the screen, on the Web, or as printed pages. Word provides many features that enable you to make changes, correct errors, and check the spelling and the grammar in your document.

Editing Documents

VOCABULARY
edit
select

When you ***edit*** a document, you modify or adapt the document and make revisions or corrections. Editing a document involves adding, deleting, changing, or moving text.

Selecting Text

When you ***select*** text, you identify a block of text you want to edit. The text can be a single character, several characters, a word, a sentence, one or more paragraphs, or even the entire document. Once you select text, you can delete it, replace it, change its appearance, move it, copy it, and so on. You can use the mouse, the keyboard, or the touch screen to select text. The quickest way to select text using the mouse is to click and hold the mouse button, drag the mouse pointer over the desired text, and then release the mouse button.

Sometimes it is difficult to select precisely when you are dragging the mouse. **Table 13–1** lists several options for selecting text using the mouse and the keyboard. To deselect the text (remove the highlighting that indicates selection), click anywhere in the document window or press an arrow key. If you accidentally delete or replace selected text, or if you just change your mind, click the Undo button.

TABLE 13–1 Ways to select text

TO SELECT	DO THIS:
Any amount of text	Click and hold the mouse button, drag the mouse pointer over the text, and then release the mouse button.
A word	Double-click the word.
A sentence	With no other text or objects selected, press and hold Ctrl, and then click anywhere in the sentence.
A paragraph	Triple-click anywhere in the paragraph. or Double-click in the blank space to the left of the paragraph.
An entire document	Press Ctrl+A. or Move the mouse pointer to the left of any text, and when the mouse pointer changes to a right-pointing arrow, triple-click.
A line	Click in the blank space to the left of the line.
Multiple lines of text	Click and hold the mouse button, and then drag the mouse pointer in the blank space to the left of the lines of text.
One or more characters to the right or left	Press and hold Shift, and then press the right or left arrow key.
One or more words to the right or left	Click the end or the beginning of a word, press and hold Ctrl+Shift, and then press the right or left arrow key.
Any amount of text (Click-Shift-Click)	Click where you want the selection to begin, press and hold Shift, and then click where you want the selection to end. Everything between the two clicks is selected. or Position the insertion point where you want the selection to begin, press F8 to toggle on the select mode, and then use the arrow keys or the mouse to indicate where you want the selection to end. (If you don't execute a command such as Delete or applying a format, press Esc to toggle the selected mode off.)
Non-adjacent text	Select the first portion of text, press and hold the Ctrl key, and then select subsequent portions of text.

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Step-by-Step 13.1



IC3
2-1.1.3
2-1.1.9

1. Start **Word** and open the **Dietary Energy** document from the drive and folder where your Data Files folder is stored. Save the Dietary Energy document as **Revised Dietary Energy 1**, followed by your initials.
2. If necessary, in the Paragraph group on the HOME tab, click the **Show/Hide ¶** button to show the nonprinting characters. The button is highlighted when the command is enabled.

3. The mouse pointer is positioned at the beginning of the first line of text. Click and hold the mouse button and then drag the mouse pointer through the first sentence of text. When all the text in the first sentence is selected, including the period at the end of the sentence, release the mouse button. The sentence is now selected, as shown in **Figure 13–1**. If you see the Mini toolbar as shown in Figure 13–1, move the mouse pointer away from the selection. You will learn to use the Mini toolbar later in this lesson.

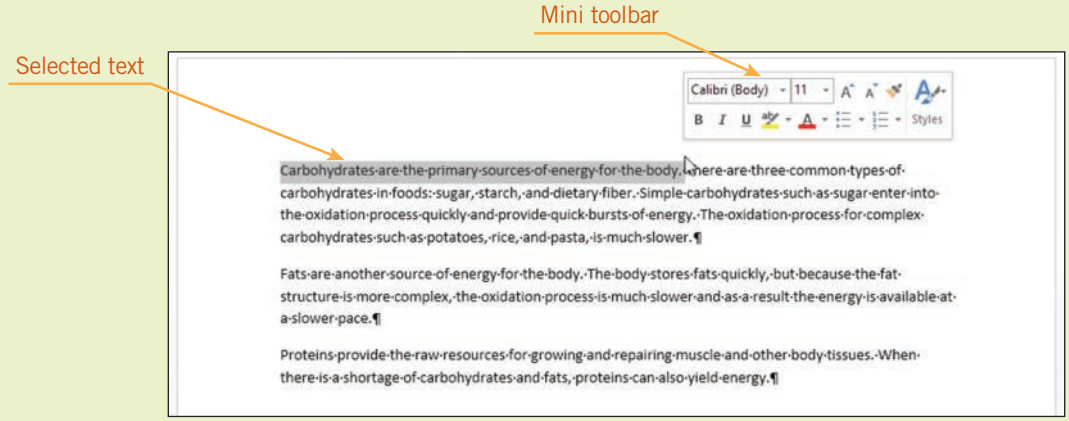


FIGURE 13–1
Selected text

4. In the last paragraph, double-click the last word, **energy**, to select it. Note that the first sentence is no longer selected.
5. Press **Ctrl+A** to select the entire document. Click anywhere in the document window to deselect the text.
6. Click to position the insertion point at the beginning of the second paragraph. Press and hold **Shift**, and then click after the word *source*. Everything between the two clicks is selected.
7. Continue to hold **Shift** and press the **right arrow** key to extend the selection. Press the **left arrow** key to reverse direction of the selection, and then keep pressing the **left arrow** key until some text in the previous paragraph is selected. Continue to hold **Shift** and press the **down arrow** and **up arrow** keys to reverse and extend the direction of the selection. Release **Shift**.
8. Click anywhere in the document window to deselect the text.
9. Position the insertion point at the end of the first paragraph. The insertion point will be displayed between the period and the paragraph marker. Press and hold **Ctrl** and **Shift** and then press **Home**. All of the text from the insertion point to the beginning of the document is selected.
10. Click anywhere in the document window to deselect the text.

WARNING

Be cautious when working with selected text. If you press any letters, numbers, or symbols on the keyboard when text is selected, the new keystrokes will replace the selected text. Pages of text can accidentally be replaced with a single character.

11. At the beginning of the first paragraph, double-click the word **Carbohydrates**. All the characters in the word are selected. Press and hold **Ctrl** and double-click the first word, **Fats**, in the second paragraph. Continue to hold **Ctrl** and double-click the first word, **Proteins**, in the third paragraph.
12. Click anywhere in the document window to deselect the text.
13. Practice other methods of selecting text following the instructions in Table 13–1.
14. Click anywhere in the document window to deselect the text. Leave the document open for the next Step-by-Step. (If you must close the document, do not save any changes to the document.)

Deleting and Inserting Characters

Editing often involves deleting and replacing existing text. You can quickly delete characters one at a time by using either the Backspace or Delete key. Backspace deletes the character to the left of the insertion point. Delete removes the character to the right of the insertion point. When you hold down either of these keys, the characters will continue to be deleted until you release the key. You can also select characters, words, sentences, or paragraphs and then press Delete or Backspace to delete the selected text.

By default, Word enters text in a document using Insert mode. In Insert mode, when you enter new text in front of existing text, the existing text shifts to the right to make room for the new text. In Overtype mode, new text replaces the existing text. When Overtype mode is activated, Insert mode is turned off. You can activate Overtype mode in the Word Options dialog box, and you can use the Insert key to toggle Overtype mode on and off.

Step-by-Step 13.2

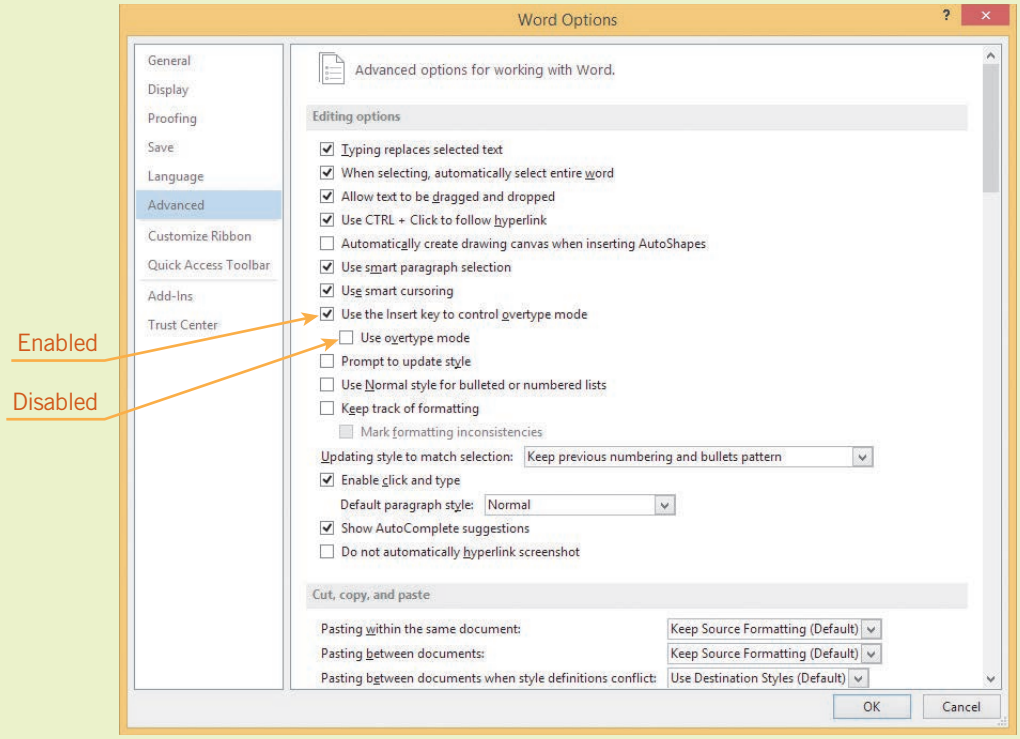
Before beginning this Step-by-Step, make sure you have enough time to also complete Step-by-Step 13.3.

IC3 2-1.1.9

1. If necessary, open **Revised Dietary Energy 1** from your solution files.
2. In the second paragraph, in the second sentence, position the insertion point at the beginning of the word *fat*. Press **Delete** to remove the first letter of the word. Double-click the remaining part of the word **at** to select it, and then press **Delete**.
3. In the second paragraph, near the end of the last sentence, position the insertion point right before the word *energy*. Press **Backspace** several times to erase the words *as a result the*.

4. To make sure Overtype mode is not activated, click the **FILE** tab, click **Options**, and then click **Advanced**. If necessary, under *Editing options*, enable the option **Use the Insert key to control overtype mode**. Also, make sure there is no check mark for the option **Use overtype mode**. Compare your screen to **Figure 13–2**. Make note of any changes you make.

FIGURE 13–2
Word editing options



5. Click **OK** to accept the settings and close the Word Options dialog box.
6. In the first paragraph, in the third sentence, double-click the word **quickly** to select it, and then type **rapidly**. The selected text is replaced with the new text.
7. In the second paragraph, in the first sentence, position the insertion point right before the word *source*. Type **major**, and then press the **spacebar**. Because Insert mode is active, Word inserts the text between the existing characters.
8. Press **Insert** to activate Overtype mode.
9. In the last paragraph, in the first sentence, position the insertion point in front of the word *resources*. Type **material**, and note that as you enter each character, the new text replaces all the characters in *resource*.
10. Press **Insert** to toggle off Overtype mode and return to Insert mode.

11. If you made any changes to the settings in Step 4, click the **FILE** tab, click **Options**, click **Advanced**, and restore the original settings. Then click **OK** to save the changes and close the Word Options dialog box.
12. Save the changes, and leave the document open for the next Step-by-Step. Be sure you complete the next Step-by-Step before changing documents or exiting Word.

Undoing, Redoing, and Repeating

Sometimes you may delete or replace text unintentionally. Whenever you perform an action that you want to reverse, you can use the Undo command. If you undo an action and then change your mind, you can reverse the undo action by using the Redo command. You can even undo and redo multiple actions at one time.

There may be times when you want to repeat your last action. For example, you may enter new text in a document and then want to add the same text in other locations in the document. You can use the Repeat command to repeat your last action. The Undo, Redo, and Repeat buttons can be accessed on the Quick Access Toolbar. When you undo an action, the Redo button exchanges with the Repeat button on the Quick Access Toolbar.

ScreenTips for the Undo, Redo, and Repeat buttons are conditional and will reflect your recent action. Sometimes an action cannot be reversed, and the ScreenTip for the Undo button displays *Can't Undo*. If you cannot repeat the last action, the Repeat button is dimmed and the ScreenTip for the Repeat button displays *Can't Repeat*.

Step-by-Step 13.3



IC3 2-1.1.5

1. The Revised Dietary Energy 1 document should already be open. Save the Revised Dietary Energy 1 document as **Revised Dietary Energy 2**, followed by your initials.
2. Position the insertion point at the end of the document. Press **Enter**, and then type your first and last names.
3. Move the insertion point to the beginning of the document.

4. On the Quick Access Toolbar, position the mouse pointer over the *Repeat* button to display the ScreenTip *Repeat Typing (Ctrl+Y)* as shown in **Figure 13–3**. Then, click the **Repeat** button. A blank paragraph and your first and last names are inserted at the position of the insertion point.

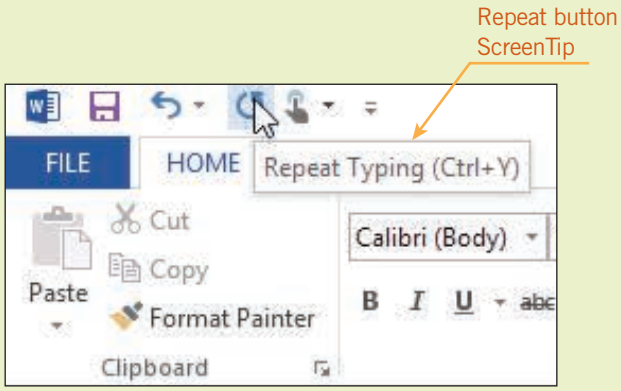


FIGURE 13–3
Quick Access Toolbar

5. On the Quick Access Toolbar, position the mouse pointer over the *Undo* button to show the ScreenTip *Undo Typing (Ctrl+Z)*. Then, click the **Undo** button. The blank paragraph and your first and last names are removed from the top of the document.
6. Click the **Undo** list arrow, and position the mouse pointer over *Typing "major"*. All the previous actions above that action in the list will also be highlighted, as shown in **Figure 13–4**. Click **Typing "major"**. The selected actions are reversed.

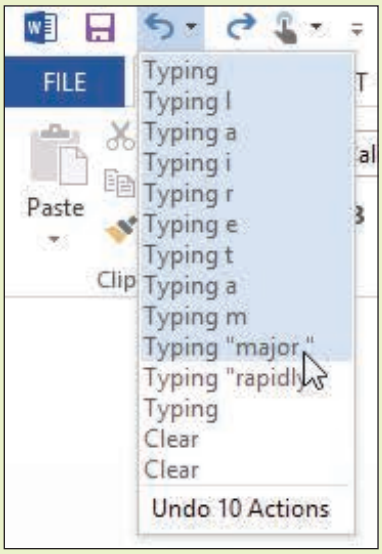


FIGURE 13–4
Multiple actions selected in the Undo list

7. On the Quick Access Toolbar, click the **Redo** button to reverse only the last undo. The word *major* is reinserted in the second paragraph.
8. Click the **Undo** list arrow. Note that the most recent action in the list now is *Typing "major"*.

9. Click anywhere in the document window to close the Undo list without reversing any actions.
10. Save the changes, and leave the document open for the next Step-by-Step.

Copying and Moving Text

Selected text can be copied or moved within a document and between documents. For example, you can copy text from an e-mail message to a Word document. There are several ways to copy and move text.

When you use the mouse to drag selected text from the existing location and then drop the selected text in a new location, it is called ***drag-and-drop editing***. Drag-and-drop editing makes moving text quick and easy, especially when you are moving the text short distances. You simply drag selected text to the new location and then release the mouse button. You can also copy text using drag-and-drop editing. Hold down Ctrl as you drag, and the selected text will be copied instead of moved.

VOCABULARY
drag-and-drop editing
Clipboard

You can also use the Cut, Copy, and Paste commands to move and copy selected text. When you use the Cut, Copy, and Paste commands, Word uses a feature called the Clipboard. The ***Clipboard*** is a temporary storage place in your computer's memory. The Clipboard can store data of all Office types, and that data can be inserted into the same document, into other documents in the same application, or into files in other Office applications.

You send selected contents of your document to the Clipboard by using the Cut or Copy commands. When the Clipboard task pane is open, the Clipboard stores up to 24 items, which you can view by showing the Clipboard task pane. If you prefer, you can work with the Clipboard task pane open.

You can retrieve the contents of the Clipboard by using the Paste command. You can select any one of the items on the Clipboard and paste it, or you can paste all of the items at once. Pasting the contents of the Clipboard does not delete the contents from the Clipboard. Therefore, you can paste Clipboard items as many times as you want. However, when you turn off the computer, the Clipboard contents are erased.

ABOVE AND BEYOND

Word offers many options for using the Clipboard. Use the Help feature to find out more about the Clipboard and to determine which options best meet your needs.

Step-by-Step 13.4



IC3
2-1.1.2
2-1.1.3
2-1.1.5
2-1.1.6
2-1.1.9

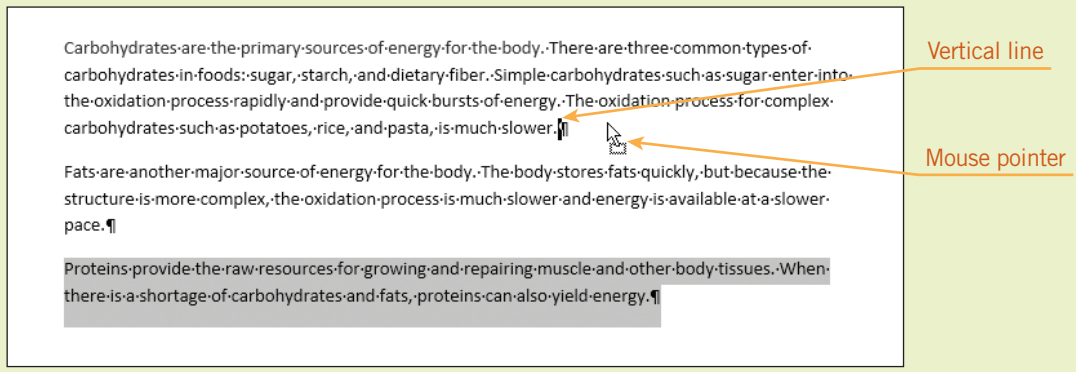
1. If necessary, open the **Revised Dietary Energy 2** document from your solution files. Save the Revised Dietary Energy 2 document as **Revised Dietary Energy 3**, followed by your initials.
2. If necessary, click the **Show/Hide** ¶ button to show the nonprinting characters. Triple-click anywhere within the third paragraph to select all the text in the paragraph. Then press and hold **Shift**, and press the **left arrow** key once to remove the paragraph marker from the selection.

QUICK TIP

To drag text beyond the current screen of text, drag the pointer to the top or bottom of the screen. The document will automatically scroll in that direction.

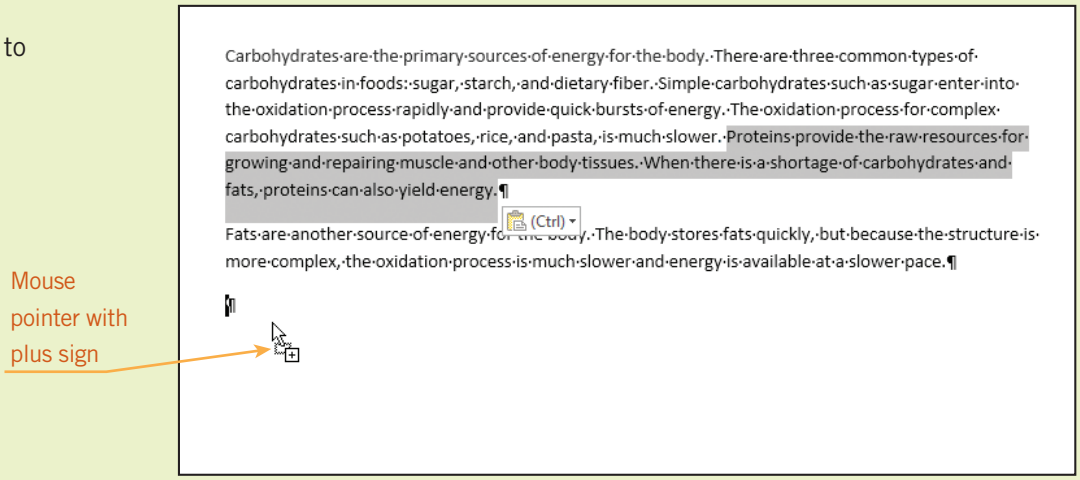
3. Point to the selection, and hold down the **left** mouse button. Drag the insertion point to the end of the first paragraph. As you drag the selected text, the insertion point changes to a vertical line as shown in **Figure 13–5**. When the insertion point is positioned at the end of the paragraph, release the mouse button. Word automatically adjusts the spacing by adding a blank space between the two sentences.

FIGURE 13–5
Dragging and dropping to move text



4. With the sentence still selected, press and hold **Ctrl** and use the left mouse button to drag the text to the end of the document. As you drag the text, the mouse pointer changes and includes a plus sign as shown in **Figure 13–6**. Release the mouse button. The text is copied to the new location.

FIGURE 13–6
Dragging and dropping to copy text



5. Click the **Undo** button two times, and then click anywhere in the document window to deselect the text.

6. On the HOME tab, in the Clipboard group, click the **dialog box launcher** to open the Clipboard task pane, as shown in **Figure 13–7**. Your Clipboard may show one or more items or no items at all, as in this figure. If items appear on the Clipboard, click **Clear All** to remove any items from the Clipboard.

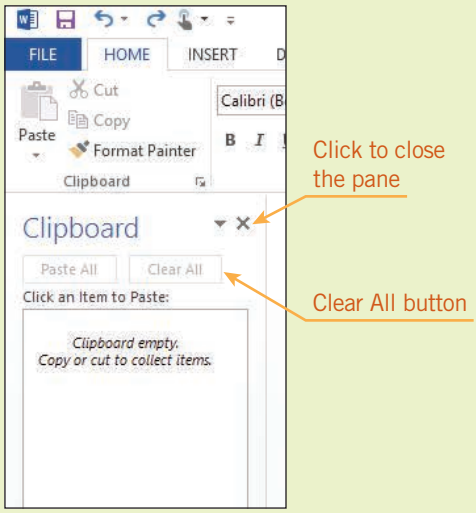


FIGURE 13–7
Clipboard task pane

7. Press and hold **Ctrl**, and click anywhere within the last sentence in the first paragraph to select the whole sentence. On the HOME tab, in the Clipboard group, click the **Cut** button. The selected text is removed from the document and is now stored on the Clipboard and is displayed on the Clipboard task pane.
8. Triple-click anywhere in the second paragraph in the document to select the whole paragraph. In the Clipboard group, click the **Copy** button. The selected text is still displayed in the document, and the selected text is also stored on the Clipboard and displayed at the top of the list on the Clipboard task pane. Deselect the text in the document window.
9. Open the **Balanced Diet** document from the drive and folder where your Data Files folder is stored. Press and hold **Ctrl** and press **A** to select the entire document, and then click the **Copy** button. The text is stored on the Clipboard.
10. Switch to the **Revised Dietary Energy 3** document, and position the insertion point at the end of the second paragraph. In the Clipboard group, click the **Paste** button. (Be sure not to click the Paste button arrow.) At the location of the insertion point, Word inserts the most recent item added to the Clipboard. Note that the copied text is still displayed on the Clipboard task pane.

11. Open a new blank document, and, if necessary, open the Clipboard task pane. There should be three items on the Clipboard. In the Clipboard task pane, click the **Paste All** button in the Clipboard task pane. All the contents on the Clipboard are inserted at the location of the insertion point. The oldest item on the Clipboard is pasted first. Even though there are three items on the Clipboard, only two paragraphs are displayed in the document because there is no paragraph marker after the *The oxidation process...* item.
12. Save the new document as **Revised Dietary Energy 4**, and then close the document. Also, switch to and then close the Balanced Diet document. If prompted to save changes, click **Don't Save**.
13. In the Revised Dietary Energy 3 document, position the insertion point at the end of the first paragraph. In the Clipboard task pane, click the item that begins **The oxidation process...**. The item from the Clipboard is inserted in the document at the location of the insertion point. In the upper-right corner of the Clipboard task pane, click the **Close** button to hide the pane.
14. Position the insertion point in front of the paragraph symbol below the second paragraph and press **Delete** to delete the blank paragraph. Save the changes to the **Revised Dietary Energy 3** document, and then close it. Leave Word open for the next Step-by-Step.

QUICK TIP

You can also access the Cut, Copy, and Paste commands by right-clicking the selected text and choosing the desired command in the shortcut menu that appears. The keyboard shortcut for Cut is Ctrl+X, for Copy it is Ctrl+C, and for Paste it is Ctrl+V.

Finding Text

VOCABULARY

incremental search

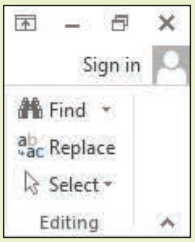
wildcard character

Scrolling through a long document to locate a specific section of text is time consuming. The Find command makes locating text or formats easier and more efficient. The Find command can be accessed in the Navigation Pane to quickly identify all occurrences of the search words. By default, Word completes an incremental search. In an ***incremental search***, as you begin typing the string of characters for which you want to search, Word highlights the matches for the character string in the document. As the search text is augmented, the matches in the document change.

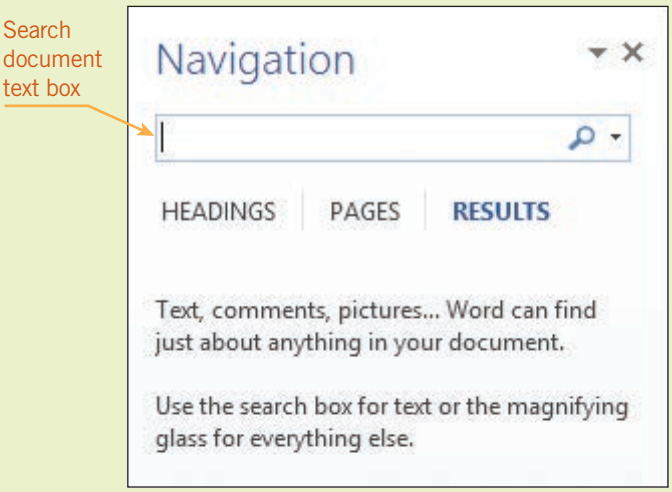
You can further define the search to find matches for whole words only, or you can search for all occurrences of a specific format in the document, such as all text formatted bold and italic. If you are looking for variations of text, you can use a ***wildcard character***, a keyboard character used to represent one or more characters in a search. The question mark (?) searches for a single character; the asterisk (*) searches for a string of characters. For example, when the search text is *b?rn*, matches could include *barn, born,* and *burn.* When the search text is *ben*,* the matches could include *bend*, *bench*, *Benny*, and *bent*.

Step-by-Step 13.5

1. Open the **Fitness Goals** document from the drive and folder where your Data Files folder is stored. Save the Fitness Goals document as **Revised Fitness Goals**, followed by your initials. Scroll down through the document. Note that there are two pages in the document.
2. If necessary, position the insertion point at the beginning of the document. On the HOME tab, in the Editing group on the far right side of the Ribbon, click the **Find** button. See **Figure 13–8**. The Navigation Pane is displayed at the left side of the document window.



3. In the Navigation Pane, the insertion point is positioned in the Search document text box as shown in **Figure 13–9**. If necessary, click **RESTRICTS**. Note that your Navigation Pane may differ. If you have previously searched for text in a Word document, the recent search words will display in the Search document box.



IC3 2-1.3.5

QUICK TIP

You can also open the Navigation Pane by clicking the VIEW tab and enabling the feature in the Show group. Or, you can use the keyboard shortcut Ctrl+F.

FIGURE 13–8
Editing group on the HOME tab

FIGURE 13–9
Navigation Pane with RESULTS selected

4. Type **workout**. As you enter the search text, incremental matches for the characters are highlighted in the document window as shown in **Figure 13–10**. When you finish entering the search text, two matches in the document window are highlighted. (Only the first match is visible in the document window; you must scroll down to see the second match.) The matches are referred to as results in the Navigation Pane, and the number of results displays below the Search document text box. Also, items showing some of the document content are displayed in the pane so you can see the occurrence of the match in the context of the document.

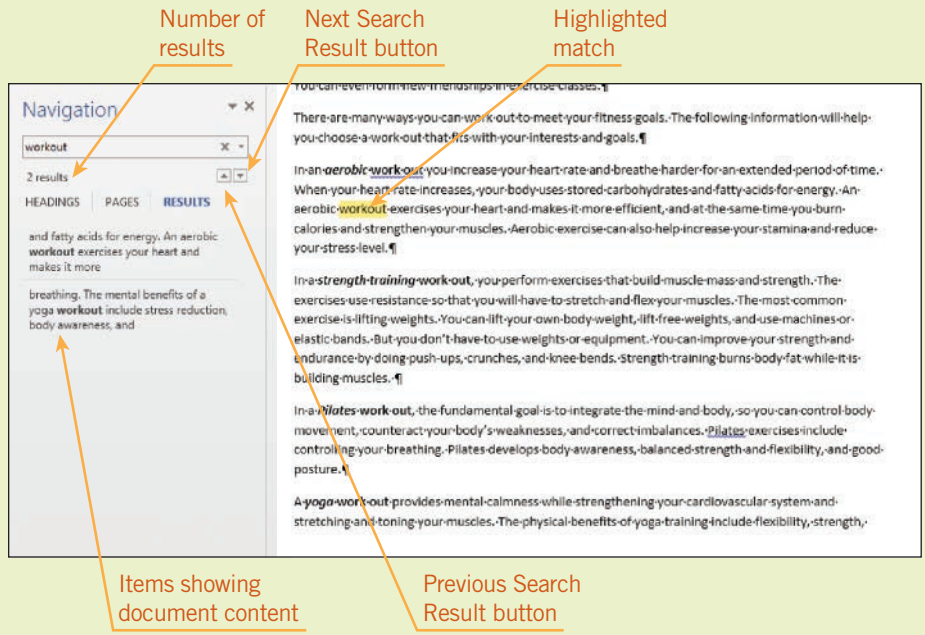


FIGURE 13–10
Navigation Pane with matches for search text *workout*

5. In the Navigation Pane, under the Search document box, click the **Next Search Result** button twice. The second occurrence of the search text is highlighted in the document window. Click the **Previous Search Result** button. The first occurrence of the search text is highlighted.
6. In the Navigation Pane, click the **PAGES** link. Only the page(s) with matches are displayed in the Navigation Pane.
7. In the Navigation Pane, click the **RESULTS** link. Then click the **Search document** text box. The current search text is selected. Type **work** in the Search document text box. The highlighted matches in the document change, and eight items now are displayed in the Navigation Pane. Note that six of the matches show *work out*, and two of the matches show *workout*.
8. In the Navigation Pane, on the right side of the Search document text box, click the **Search for more things** arrow. In the menu, click **Options** to open the Find Options dialog box shown in **Figure 13–11**. These options enable you to further define your search.

QUICK TIP

The key combination Shift+F4 repeats the last search. This shortcut is convenient when you have closed the Navigation Pane.

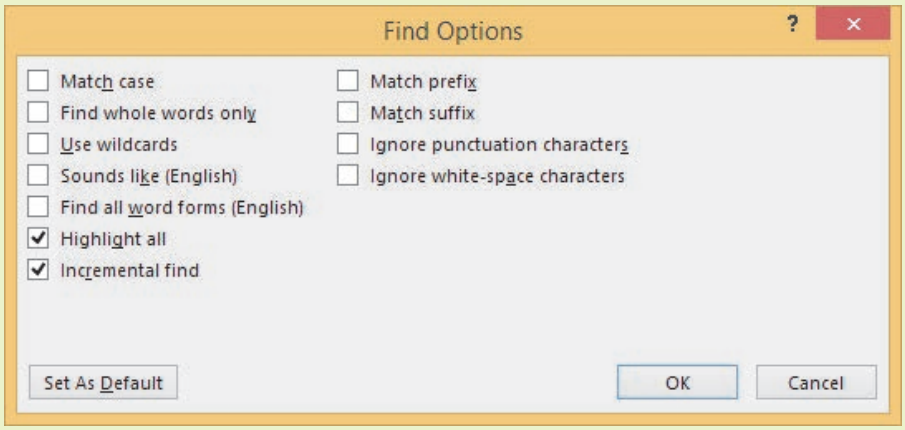


FIGURE 13–11
Find Options dialog box

9. Click the **check box** next to the *Find whole words only* option to enable the option, and then click **OK**. Click the **Search document** text box, and then type **work** in the text box. Now only six matches are displayed. Note that the two occurrences of the word *workout* are not highlighted because the search was for whole words only.
10. Click the **Search for more things** arrow. Click **Options**, and enable the **Use wildcards** option. The *Find whole words only* and *Incremental find* options are automatically disabled. Click **OK** to save the changes and close the dialog box.
11. In the Navigation Pane, click the **Search document** text box, type **f?t** in the text box, and press **Enter**. Eleven matches are found including *fitness, fits, of time, fatty, fat,* and *benefits.*
12. Click the **Search document** text box, type **fit*** in the text box, and press **Enter**. Eight matches are found including *fitness, fits,* and *benefits.*
13. Click the **Search for more things** arrow. Click **Options**, and then disable the option **Use wildcards**. Enable the **Incremental find** option, and click **OK**.
14. Close the Navigation Pane. Leave the document open for the next Step-by-Step. If you must close the document, do not save any changes.

Replacing Text

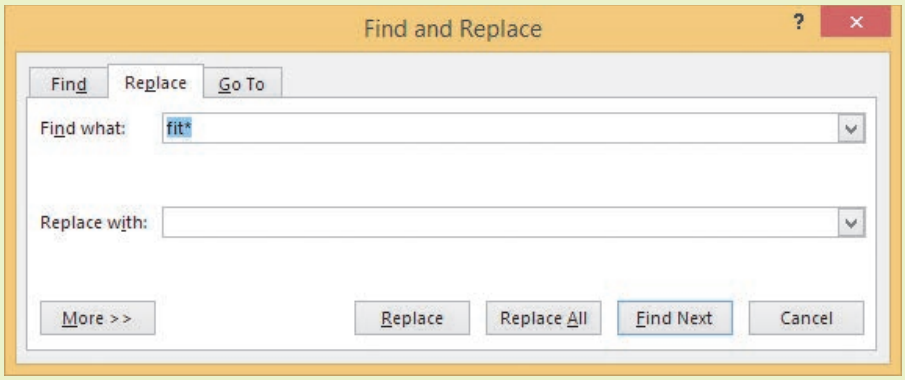
When you need to replace or reformat multiple occurrences of the same text, you can use the Replace command. The replacements can be made individually, or all occurrences can be replaced at once.

Step-by-Step 13.6

IC3 2-1.2.2 2-1.3.5

1. If necessary, open **Revised Fitness Goals** from your solution files. Position the insertion point at the beginning of the document.
2. On the HOME tab, in the Editing group, click the **Replace** button. The Find and Replace dialog box opens, and the Replace tab is displayed as shown in **Figure 13–12**. Notice that the word from your previous search is displayed in the Find what text box.

FIGURE 13–12
Replace tab in the Find and Replace dialog box

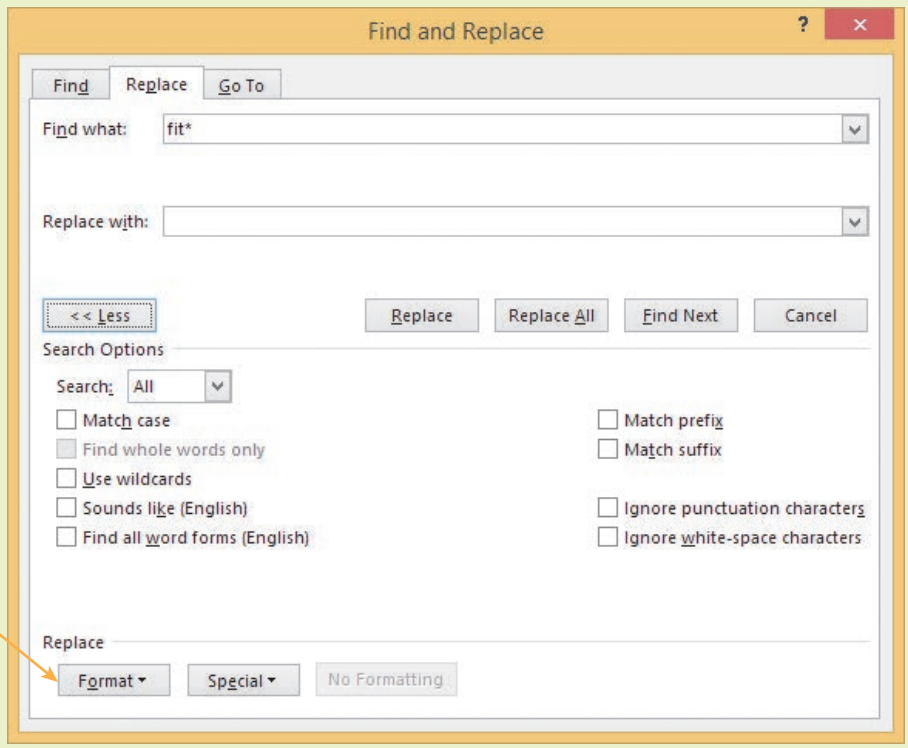


QUICK TIP

You can also open the Find and Replace dialog box by clicking the Search for more things arrow in the Navigation Pane, and then in the menu, click Replace. The keyboard shortcut to execute the Find command is Ctrl+F. Use Ctrl+H to execute the Replace command.

3. In the Find and Replace dialog box, click **More** for more options, as shown in **Figure 13–13**.

FIGURE 13–13
More options in the Find and Replace dialog box



4. In the Find what text box, delete any current text, and then type **work out** in the text box. With the insertion point still in the Find what text box, click **Format** in the lower-left corner of the dialog box, and then click **Font** to open the Find Font dialog box shown in **Figure 13–14**.

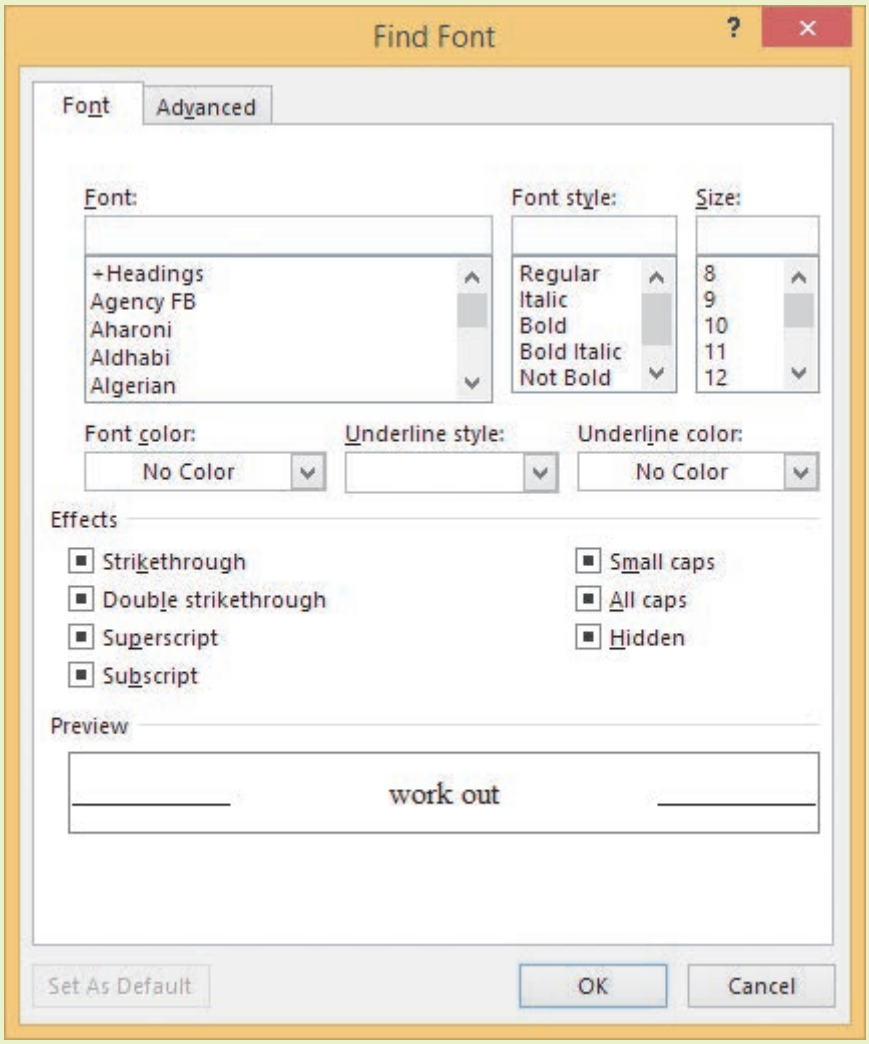


FIGURE 13–14
Find Font dialog box

5. Under *Font style*, click **Bold**, and then click **OK**. Note that *Font: Bold* is displayed under the *Find what* text box on the Replace tab. Word will now search for all occurrences of *work out* with the bold format.
6. In the Replace with text box, type **workout** in the *Replace with* text box. With the insertion point still in the *Replace with* text box, click **Format**, and then click **Font**. In the Replace Font dialog box, click **Bold Italic**, and then click **OK**. The search text will be replaced with the new text formatted bold and italic.
7. In the Find and Replace dialog box, click **Find Next**. In the document window, the first occurrence of the bold text *work out* is selected. If necessary, drag the dialog box title bar to reposition the dialog box near the upper-right corner of the screen so you can see the selected match.

8. Click **Find Next** again. No replacements are made in the document, and the next occurrence of the search text is selected. If necessary, drag the dialog box down near the lower-right corner so you can see the selected match.
9. In the dialog box, click **Replace**. The selected text is replaced with *workout*, formatted bold and italic, and the next occurrence of *work out* is selected.
10. In the dialog box, click **Replace All**. Word replaces all remaining occurrences of the search text with the replacement text. A message box opens, indicating that three replacements were made. Click **OK** to close the message box.
11. In the Find and Replace dialog box, position the insertion point in the Find what text box. At the bottom of the dialog box, click **No Formatting**. The formats are removed from the Find what text box. Position the insertion point in the Replace with text box, and click **No Formatting** to remove the formats from the Replace with text box.
12. Click **Find Next** once to complete a search without formats. This clears the format settings from the Find what and Replace with text boxes so your next search does not include formats. A message box appears, indicating that the search item was not found and prompts you to search the beginning of the document. In the message box, click **No**.
13. In the dialog box, click **Less** to hide the options in the dialog box. Then close the dialog box. Save the changes to the document, and then close the document. Leave Word open for the next Step-by-Step.

Using the Proofing Tools

QUICK TIP

The spelling and grammar checkers are helpful tools, but you still need to have a good working knowledge of English grammar and spelling. The spelling and grammar checkers can identify a possible problem, but it is up to you to decide if a change is necessary.

An accurate document makes a good impression. Word provides several proofing tools that can help you prepare an error-free document.

Automatically checking the spelling in a document can significantly reduce the amount of time you spend proofreading. When the Proofing option is enabled, as you enter text, Word checks the spelling of each word against its standard dictionary. If Word cannot find the word in its dictionary, it will underline the word with a wavy red line. This does not necessarily mean the word is misspelled. It simply means the word is not listed in Word's dictionary. You can right-click the flagged words to access a shortcut menu to view suggestions for other spellings.

Good proofreading skills also include checking grammar. When you check the grammar in a document, you read for content and make sure each sentence makes sense. Options are also available to automatically check for grammar errors such as incomplete sentences, the wrong use of words, and capitalization and punctuation errors. Possible grammar errors are identified with a wavy blue line below a word, phrase, or sentence. Just like the spell checker, you can right-click the flagged words to access a shortcut menu to view suggestions for changes.

The red or blue underlines are only visible on your screen. They will not appear when you print the document. If you have second thoughts about words and grammar that you chose to ignore, you can recheck the document.

It is common for people to make the same spelling or typing error over and over. For example, you may often enter *hte* instead of *the*. The AutoCorrect feature automatically corrects errors as you enter text, which saves editing time. The AutoComplete feature suggests the spelling for frequently used words and phrases. For example, as you begin to enter the day of the week or the month, AutoComplete provides an option for completing the word for you.

Step-by-Step 13.7

1. Open a new blank document. Click **FILE** and then click **Options**. In the left pane of the Word Options dialog box, click **Proofing**. Compare your settings to those in **Figure 13–15**. Make note of your settings. Then, if necessary enable the **Mark grammar errors as you type** and **Check grammar with spelling**. A checkmark indicates that the option is enabled.

IC3 2-1.1.5

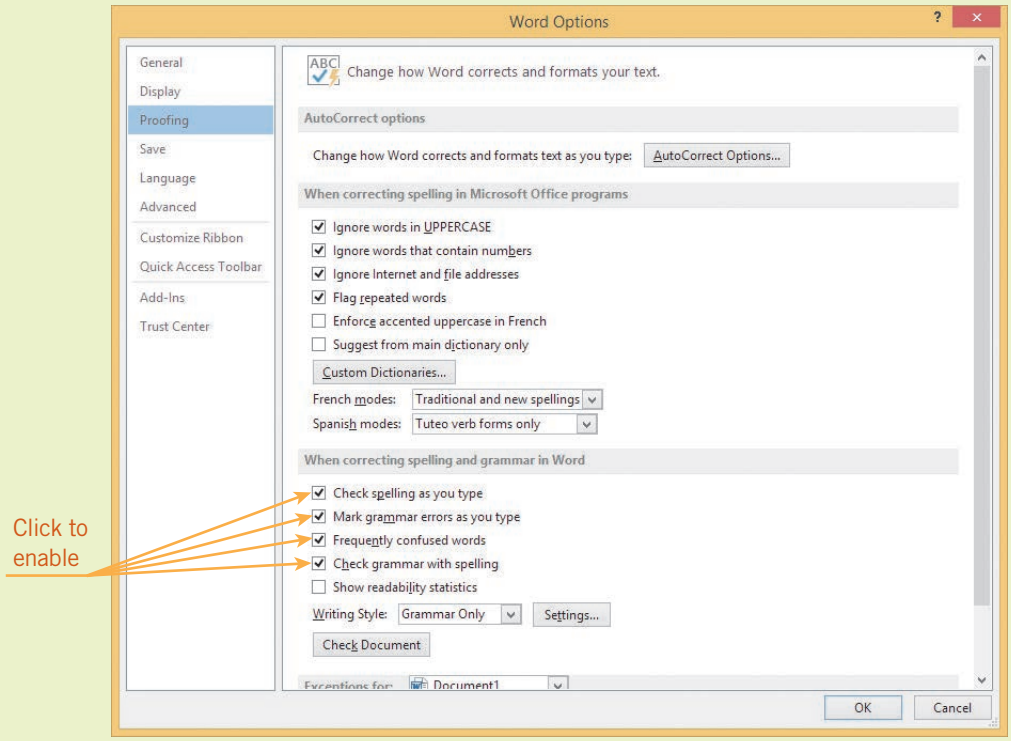
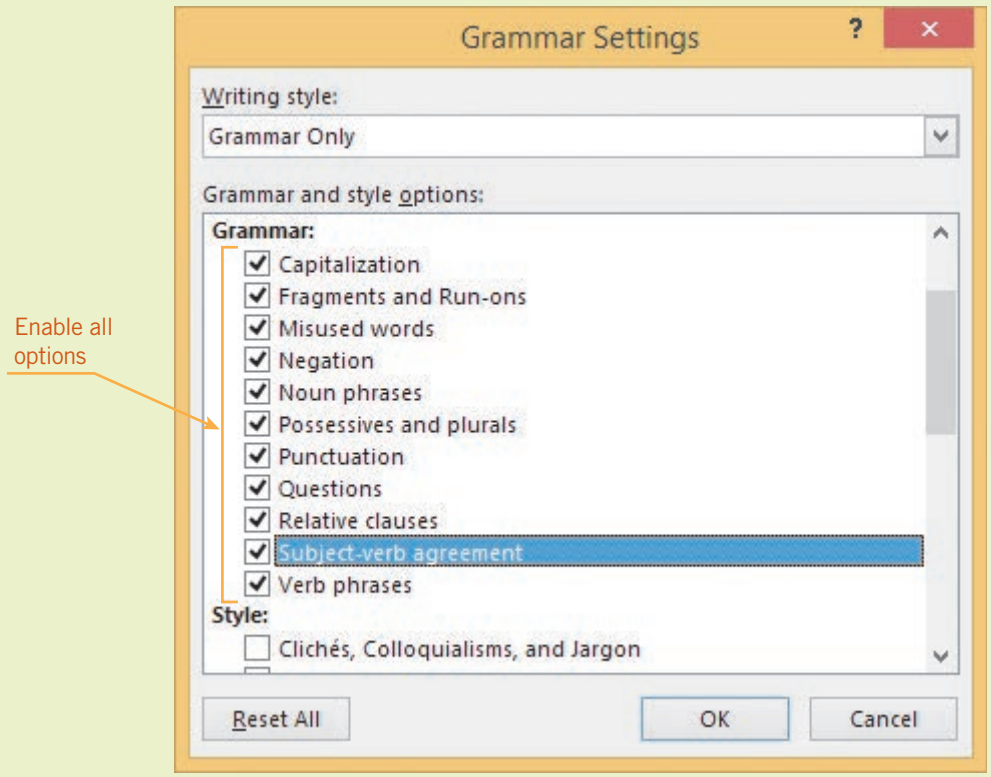


FIGURE 13–15
Proofing settings in the Word Options dialog box

2. At the bottom of the dialog box, next to *Writing Style:*, click **Settings** to open the Grammar Settings dialog box shown in **Figure 13–16**. Make note of your settings. Scroll down through the Grammar list, and if necessary, enable all the Grammar options.

FIGURE 13–16
Grammar Settings dialog box



3. Click **OK** twice to accept the changes and to close both dialog boxes.
4. Type the following text exactly as shown here: **It is beleived**. Then watch the screen as you press the **spacebar**. Word will automatically correct the spelling and change the word *beleived* to *believed.*
5. Complete the sentence by typing **the potawatomi indians were originally part of the ancient tribe Anishinabe.**, and then press **Enter**. Notice there are red wavy lines under the words *potawatomi* and *Anishinabe.* Word automatically corrected the capitalization of the word *indians.*
6. Save the document as **Indians 1**, followed by your initials.
7. Position the mouse pointer over the word *potawatomi* and right-click. A shortcut menu opens and shows alternative spellings at the top of the menu. In the shortcut menu, click the first option, **Potawatomi**. The word in the document is corrected.
8. Right-click the word **Anishinabe**. The spelling you entered is correct, but this word is not included in the Word standard dictionary; that is why the word is flagged. In the shortcut menu, click **Ignore All**. The red wavy line is removed, and the word *Anishinabe* will not be flagged as misspelled if entered again in this document.

ABOVE AND BEYOND

If you have an Internet connection, you can have quick access to an online dictionary. In the Proofing group on the REVIEW tab, click the Define button. The first time you use this feature, you will need to download a dictionary from the Office Store. (Generally, the dictionaries are free.) Then when you're not sure what a word means, click anywhere within the word and then click the Define button. Word will connect you with the online dictionary, a dictionary pane will open, and the definition of the word will display in the pane.

9. Position the insertion point at the end of the document, and type **In the early 1700s, lived near Green Bay, Wisconsin**. and then press **Enter**. The entire sentence is underlined with a blue wavy line.
10. Position the mouse pointer over any part of the blue underlined sentence and right-click. A shortcut menu is displayed, and the words *Fragment (consider revising)* appear at the top of the menu. Click outside the shortcut menu to close it. Position the insertion point in front of the word *lived*, type **they**, and then press the **spacebar**. The blue wavy line disappears.
11. Click the **FILE** tab, click **Options**, and then click **Proofing**. At the bottom of the dialog box, under *Writing Style*, click **Recheck Document**. When prompted to reset the spelling checker and the grammar checker, click **Yes**. Then click **OK** to close the dialog box. The word *Anishinabe* is flagged again.
12. Position the insertion point at the end of the document. Slowly type **Sept** and watch for a ScreenTip to appear above the four new characters, suggesting the word *September*. Press **Enter** to accept the AutoComplete word. Then press the **spacebar**, and type the current year (for example: 2016).
13. Save the changes and leave the document open for the next Step-by-Step.
14. If you made changes to the Word Options settings and you plan to complete Project 13–1 at the end of the lesson, do not restore the settings at this time. If you do not plan to complete Project 13–1 at the end of the lesson, restore the Word Options settings to those that you noted in Steps 1 and 2.

QUICK TIP

If you want assistance correcting the grammar, in the shortcut menu, click About this Sentence. A Word Help screen will open with suggestions for corrections.

Using the Thesaurus and Word Count Features

As you write a report, you may struggle to think of the appropriate word or phrase to make the content easier for the reader to understand. Or, you may want to use a synonym to avoid overusing a word. You can quickly access a thesaurus by clicking a command in the Proofing group on the REVIEW tab.

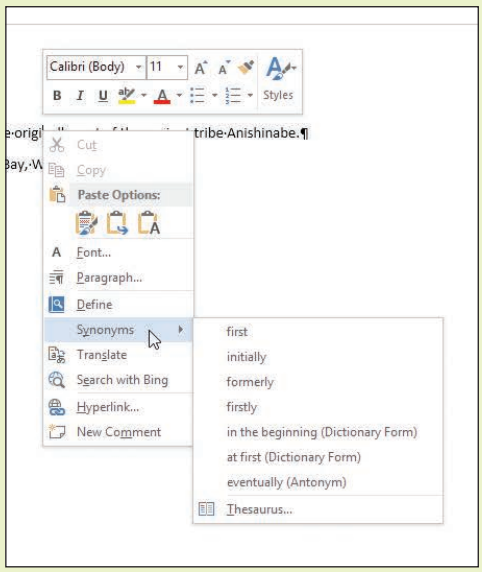
How many times have you been required to meet a minimum or maximum requirement for the total number of words in a document? The Word Count command, also accessible in the Proofing group on the REVIEW tab, provides statistics about your document that include the number of pages, sentences, lines, and characters, as well as how many words are in your document. You can see the current number of words in the document in the status bar at the bottom of the window.

Step-by-Step 13.8

2-1.1.3
2-1.3.5

1. If necessary, open **Indians 1** from your solution files. Save the document Indians 1 as **Indians 2**, followed by your initials.
2. In the first sentence, position the mouse pointer over the word *originally* and right-click to open the shortcut menu. On the shortcut menu, click **Synonyms** to open the submenu shown in **Figure 13–17**.

FIGURE 13–17
Shortcut menu and Synonyms submenu

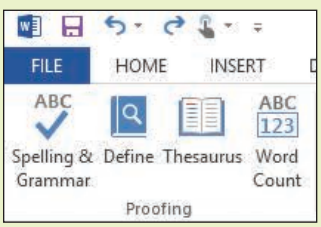


QUICK TIP

To find synonyms for a phrase, select all the words in the phrase.

3. On the submenu, click **initially**. The word *originally* is replaced with the word *initially*.
4. In the second sentence, position the insertion point anywhere within the word *near*. Click the **REVIEW** tab. In the Proofing group, shown in **Figure 13–18**, click the **Thesaurus** button.

FIGURE 13–18
Proofing group on the REVIEW tab



5. The Thesaurus task pane, shown in **Figure 13–19**, opens and shows a list of synonyms for the word *near*.

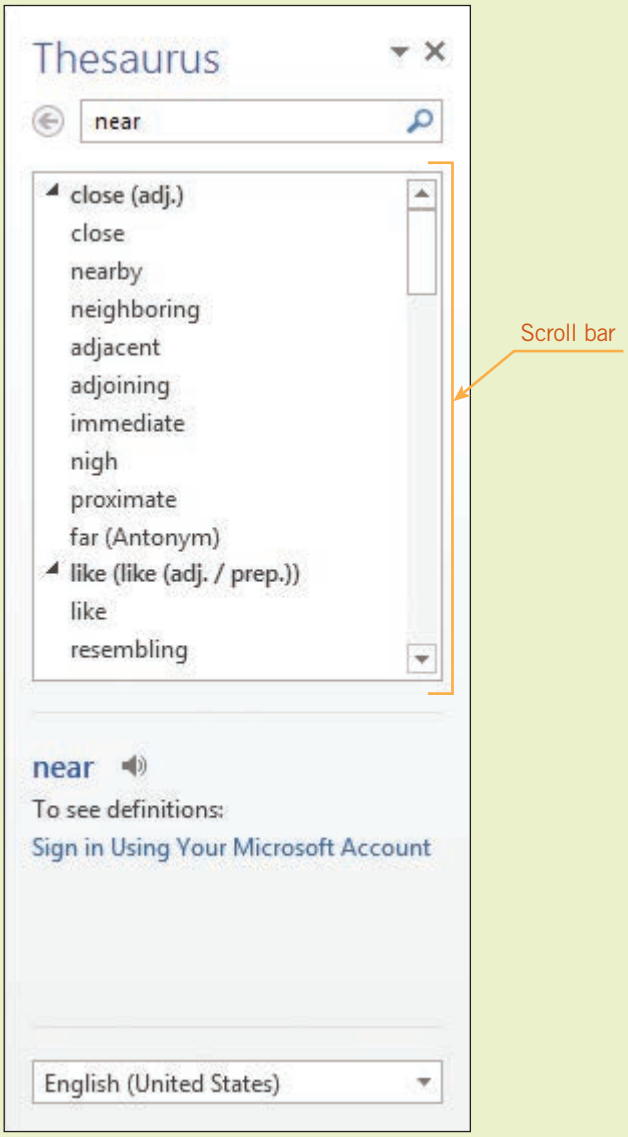


FIGURE 13–19
Search results in Thesaurus pane

6. In the Thesaurus list, scroll down to view the suggested terms below *nearby (adv.)*. Point to *close to (Dictionary Form)*, and then click the **list arrow** as shown in **Figure 13–20**. Click **Insert**. The word *near* in the document is replaced with *close to*.

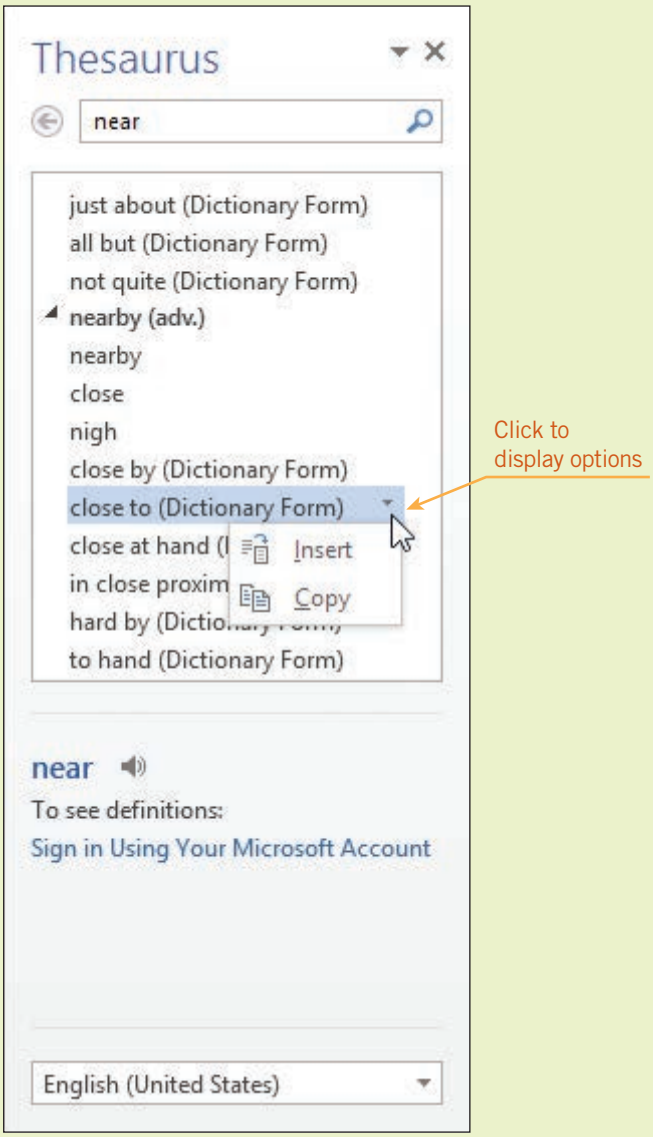


FIGURE 13–20
Options in the list on the Thesaurus pane

7. On the REVIEW tab, in the Proofing group, click the **Word Count** button. The Word Count dialog box shown in **Figure 13–21** opens, revealing the statistics for the document.

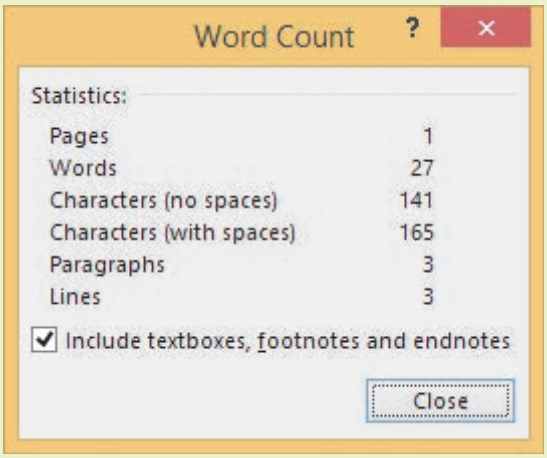


FIGURE 13–21
Word Count dialog box

8. Note that the word count (27) is also displayed on the task bar in the lower-left corner of the screen. Close the Word Count dialog box.
9. Save the changes to the document and then close the document. Leave Word open for the next Step-by-Step.

Formatting Documents

VOCABULARY
format
manual line break
alignment
margins

When you ***format*** a document, you change the appearance of the text or of the whole document. The formats and design elements used in a document should reflect the purpose of the document and the needs of the reader. Formats can be applied either before or after you enter text in a document.

Word offers a number of formats, including character formats, paragraph formats, and document formats:

- Font styles, text color, and underline are examples of character formats. You can apply more than one character format at a time. For example, you can apply both color and underline formats to characters.
- A paragraph format is applied to an entire paragraph and cannot be applied to only a portion of a paragraph. For example, you cannot single space part of a paragraph and double space the rest. Word defines a paragraph as any amount of text that ends with a paragraph marker. A paragraph marker is inserted by pressing Enter, which creates a ***manual line break***. When you create a manual line break, the new paragraph will include the same paragraph formats as the previous paragraph. Paragraph formats include ***alignment*** (how the text is positioned between the left and right margins), tabs, and line spacing.
- Document formats apply to an entire document. For example, paper size and ***margins***, the blank spaces around the edges of the page, are document formats. You can position the insertion point anywhere in a document to change the entire document format.

Applying Character Formats

VOCABULARY
font
points

Changing the character format can actually make a document easier to read. A ***font*** is the design of the typeface in your document. Fonts are available in a variety of styles and sizes, and you can use multiple fonts in one document. The size of the font is measured in ***points***. The larger the point number, the larger the font size. You can quickly change the appearance of the font by using the command buttons in the Font group on the HOME tab. When you open the Font dialog box, more font options are available, and you can make several font changes at one time.

Changing the character format can also set the tone for a document. Consider the purpose of the document when you apply character design elements. While formatting text in all caps can draw the reader's attention, it can also send the wrong message. Some readers may feel text in all caps means that you are yelling at them. Although some font styles and font colors may make the text look pretty or cool, they may also make it harder to read the text.

Step-by-Step 13.9

IC3
2-1.1.3
2-1.1.9
2-1.2.2

1. Open the **H2O Harbor** document from the drive and folder where your Data Files folder is stored. Save the H2O Harbor document as **Revised H2O Harbor 1**, followed by your initials.
2. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **Line Numbers** button, and then click **Continuous** from the list of options. Line numbers will be displayed to the left of each line, which will make it easier to identify the lines of text in the document.
3. Drag the mouse pointer to select all of the text in line 1. Word is intuitive, and because you selected text, the Mini toolbar with common formatting commands appears above the selection. Your screen should look similar to **Figure 13–22**. If the Mini toolbar appears semitransparent, position the mouse pointer over the *Mini toolbar* and the image will brighten. If you do not see the Mini toolbar, select the text again, and do not move the mouse pointer away from the selection.

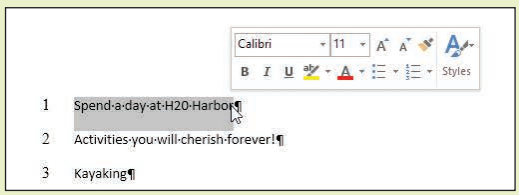


FIGURE 13–22
Image of the Mini toolbar

4. On the Mini toolbar, click the **Bold** button to apply the bold format. Move the mouse pointer away from the Mini toolbar, and the toolbar disappears.

5. Click the **HOME** tab. In the Font group, shown in **Figure 13–23**, notice that the Bold button is highlighted to indicate that the selected text is formatted bold. With the text still selected, in the Font group, click the **Change Case** button Aa, and then click **UPPERCASE**.

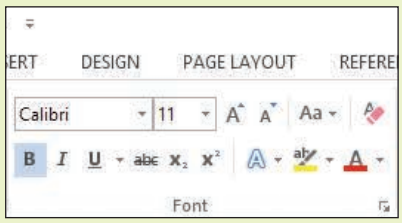


FIGURE 13–23
Font group on the HOME tab

6. Select all of the text in line 2. On the Mini toolbar, click the **Bold** button, and then click the **Italic** button I. Also on the Mini toolbar, click the **Font Color** list arrow A, and click a **red** color.
7. Select all of the text in line 4. In the Font group, click the **Underline** list arrow U, and then click the last option in the list (the **Wave underline**). Click the **Underline** button U. The underline format you just applied is toggled off. Click the **Underline** button again. The Wave underline option is applied because it is the last underline option used.
8. Drag the mouse pointer to select all of the text in lines 7, 8, and 9. In the Font group, click the **Font** list arrow Calibri (Body) to display a list of font options. Position the mouse pointer over one of the font options in the list to show the Live Preview of the new font in the document window, as shown in **Figure 13–24**. Position the mouse pointer over a different font option, and the Live Preview reflects the change in fonts. The text format does not change, however, until you choose a new font style.

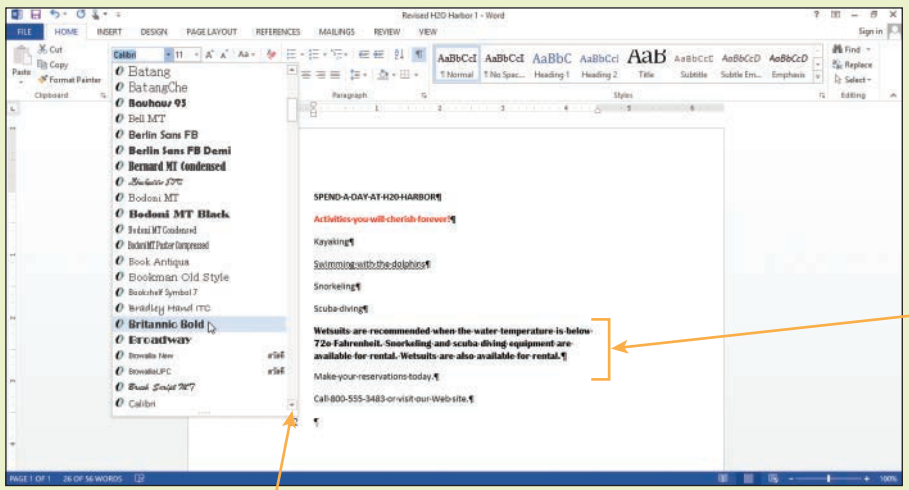


FIGURE 13–24
Live preview for a font style

9. Scroll down the list of fonts, and select **Comic Sans MS**. The text in the document changes, and the name of the new font is displayed in the Font box on the Ribbon. With the text still selected, click the **Font Size** list arrow . The font sizes are listed in increments. In the size list, click **14** to change the font size to 14 points. With the text still selected, in the Font group, click the **Decrease Font Size** button  three times to decrease the size by three increments. Then, in the Font group, click the **Increase Font Size** button  once. The size increases by one increment, and the Font Size box displays the setting *11*.
10. With the text still selected, click the **Font Size** box. The current font size is selected. Type **12**, and then press **Enter**. The font size is changed to 12 points.
11. In line 8, after 72, select the letter **o**. (*Hint:* Use the arrow keys to position the insertion point in front of the character; then press and hold **Shift** and press the **right arrow** key to select the character.) In the Font group, click the **Superscript** button  . In line 1, select the number **2** in *H2O*. In the Font group, click the **Subscript** button  .
12. Position the insertion point at the end of the document in line 13. Change the font size to **14**, type **www.H2Oharbor.net**, and then press **Enter**. A hyperlink format is automatically applied to the URL. Because this document will not be published on the Web, you do not need a hyperlink format. Right-click the **hyperlink**, and then in the shortcut menu click **Remove Hyperlink**.
13. Select the text in line 13. In the Font group, click the **Text Highlight Color** list arrow  and then click the **Turquoise** color block. The color highlight is applied to the selected text.
14. Save the changes, and leave the document open for the next Step-by-Step.

QUICK TIP

To highlight multiple sections of text throughout the document, select the highlight color first. The pointer changes to show a highlighter pen, and then you can drag the pointer over text to apply the highlight. To toggle the highlight option off, click the Text Highlight Color button or press Esc.

Applying Paragraph Formats

Changing the paragraph formats can also make the document more attractive and easier to read. Paragraph formats include adjusting the blank space between lines of text, aligning text, setting tabs and indents, and adding bullets and numbering. Most of the paragraph formats can be applied using the command buttons in the Paragraph group on the HOME tab.

The default line spacing in Word is single spacing. When text is double-spaced, there is a blank line between each line of text, which makes it easier to read. Many reports are formatted with double line spacing. You can also adjust the spacing both before and after the paragraph, which is common in newsletters to help to save space on a page or to make a headline stand out.

Alignment refers to how text is positioned between the left and right margins. Text can be aligned in four different ways: left, center, right, or justified. When the justified alignment is applied, the text is aligned at both the left and right margins and

extra space is added between words as needed. The default setting is left alignment. Center alignment is often used for titles, headings, and invitations. Right alignment is often used in tables for dollar amounts and dates. You can quickly apply any of these alignments using the buttons in the Paragraph group on the HOME tab.

Step-by-Step 13.10

2-1.1.3
2-1.1.9
2-2.2.1
2-2.2.2

1. If necessary, open **Revised H2O Harbor 1** from your solution files. Save the Revised H2O Harbor 1 document as **Revised H2O Harbor 2**, followed by your initials.
2. If necessary, click the **PAGE LAYOUT** tab. To show the line numbers, if necessary, click the **Line Numbers** button, and then click **Continuous**. Note that there are 14 lines in the document.
3. Click the **HOME** tab. Select all of the text in the document. In the Paragraph group, shown in **Figure 13–25**, click the **Line and Paragraph Spacing** button.



FIGURE 13–25
Paragraph group on the HOME tab

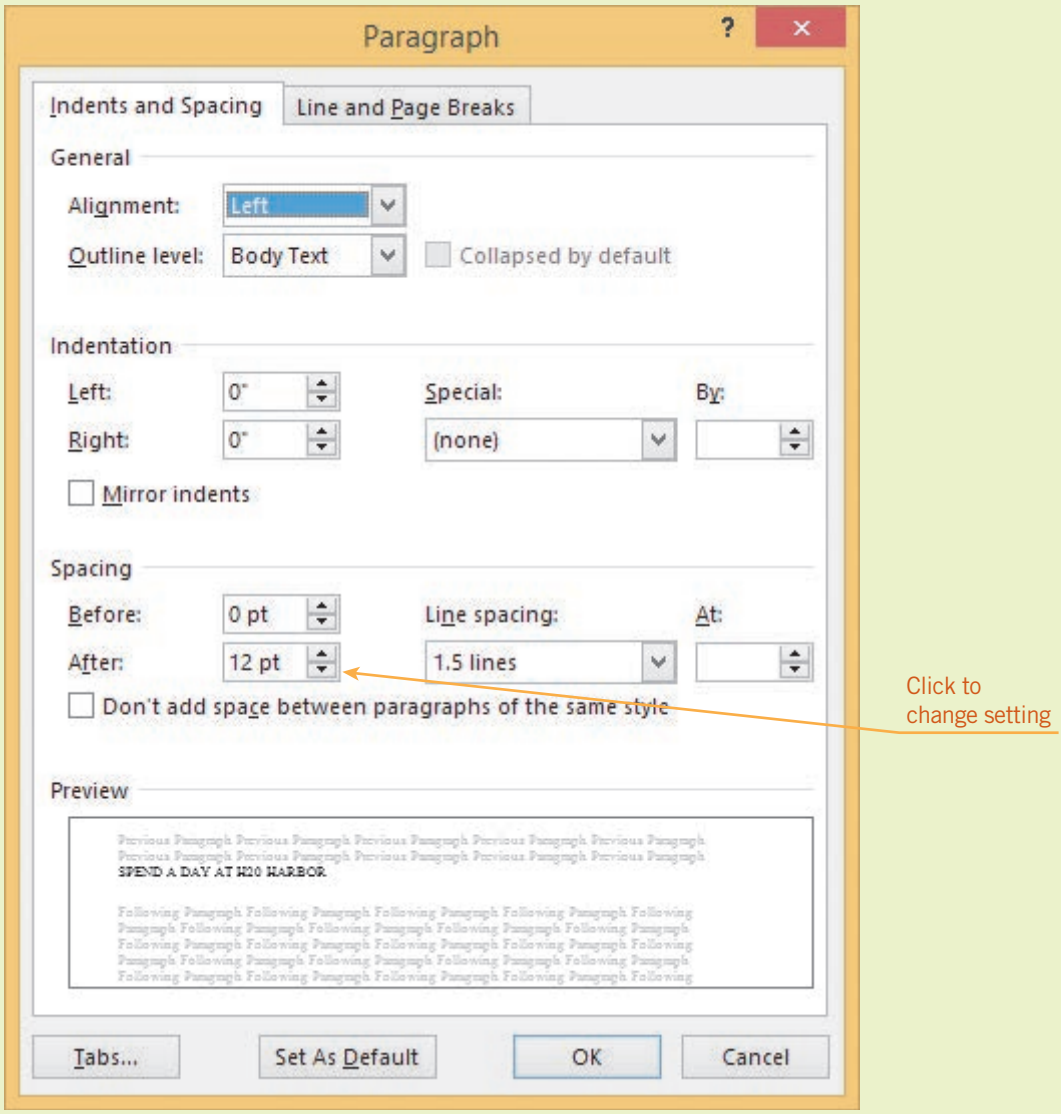
4. In the list of options, click **2.0**. All of the lines in the document are now double-spaced. There are still 14 lines in the document, but there is more blank space between the lines.
5. With all of the text still selected, click the **Line and Paragraph Spacing** button, and then click **1.5**. The spacing between lines is reduced to 1½ line spacing, and there is less blank space between each line of text.
6. Position the insertion point in line 8. Click the **Line and Paragraph Spacing** button, and then click **Add Space Before Paragraph**. Extra blank space is added between lines 6 and 7.
7. With the insertion point still positioned in line 8, click the **Line and Paragraph Spacing** button. Note that in the list the next to last option has changed. Click **Remove Space Before Paragraph**.
8. Position the insertion point in line 1. Click the **Line and Paragraph Spacing** button, and then click **Remove Space After Paragraph** at the bottom of the list of options. The extra blank space between lines 1 and 2 is removed. Click the **Line and Paragraph Spacing** button again, and then click **Add Space After Paragraph**.

QUICK TIP

The keyboard shortcut for single-spaced is Ctrl+1. For 1.5-spaced, the shortcut key combination is Ctrl+5, and for double-spaced it is Ctrl+2.

9. In the Paragraph group, click the **dialog box launcher** to open the Paragraph dialog box shown in **Figure 13–26**. Notice that under *Spacing*, the *After* box shows *12 pt*. Click the **down arrow** once to reduce the setting to 6 pt. Press **Delete** to remove the number 6, and then type **8**. Click **OK** to apply the change and close the dialog box. The space between lines 1 and 2 is adjusted.

FIGURE 13–26
Paragraph dialog box



QUICK TIP

The keyboard shortcut for left alignment is Ctrl+L; for right alignment, Ctrl+R; for center alignment, Ctrl+E; and for justified alignment, Ctrl+J.

10. With the insertion point positioned in line 1, in the Paragraph group, click the **Center** button. Select all the remaining lines in the document, and then click the **Center** button. All the lines are centered horizontally on the page.

11. Position the insertion point in line 8. In the Paragraph group, click the **Align Right** button. The text in all four lines of the paragraph is aligned at the right margin. In the Paragraph group, click the **Align Left** button to move the text back to the left margin. Next, click the **Center** button to center the text between the left and right margins.

12. Select all the text in lines 1 and 2, and increase the font size to **18**. Then select all of the text in lines 3, 4, 5, and 6, and increase the font size to **14**. Deselect the text.
13. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **Line Numbers** button, and then click **None**.
14. Save the changes to the document, and then close the document.

Setting Tabs and Indents

Tabs are useful for indenting paragraphs and lining up columns of text. Word's default tabs are set at every half inch. You can, however, set custom tabs at other locations. There are four alignment options and a vertical bar for tabs. **Table 13–2** describes each of the options.

TABLE 13–2 Options for tab settings

TAB SETTING	DESCRIPTION
Left tab	This is the default tab style. When you begin to enter text at the tab, the text is aligned on the left and extends to the right.
Center tab	Text is aligned evenly on either side of the tab position.
Right tab	Text is aligned on the right and extends to the left.
Decimal tab	Numbers with decimals are all aligned at the decimal point, and text aligns on either side of the tab. A decimal tab can be used to align numbers or text.
Bar tab	This setting does not position the text, but a vertical bar is displayed in the paragraph at the tab position. If the tab is formatted for multiple paragraphs, the vertical bar is displayed in all the paragraphs to create a vertical line along the column of text or numbers.

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ABOVE AND BEYOND

If you want to set precise measurements for tabs, on the HOME tab, click the Paragraph group dialog box launcher and then click Tabs to open the Tabs dialog box.

An ***indent*** is a space inserted between the margin and where the line of text appears. You can indent text from the left margin, from the right margin, or from both the left and right margins. For example, to draw attention to specific paragraphs in a document, you can indent all the lines of the paragraph from the left and right margins. To make a long document with several paragraphs easier to read, you can format a first line indent. In a ***first line indent***, the first line of each paragraph is indented, making it easy for the reader to tell where a new paragraph begins. When creating a bibliography for a report, you need to format a ***hanging indent***, where the first line of text begins at the left margin, and all other lines of the paragraph hang, or are indented, to the right of the first line.

The ruler, which is available from the Show group on the VIEW tab, can be used to quickly set tabs, indents, and margins in your document. The ruler is also a handy reference to see the "true" size of your text and document.

VOCABULARY

indent

first line indent

hanging indent

Step-by-Step 13.11

IC3
2-1.1.3
2-1.1.9
2-2.2.1
2-2.2.2
2-2.2.3

1. Open the **Documentaries** document from the drive and folder where your Data Files folder is stored. Save the Documentaries document as **Revised Documentaries**, followed by your initials.
2. If necessary, show nonprinting characters. Display continuous line numbers.
3. To control the formatting marks that are displayed on the screen, click the **FILE** tab, click **Options**, and then click **Display**. Under *Always show these formatting marks on the screen*, make sure **Show all formatting marks** is enabled. Click **OK** to close the Word Options dialog box.
4. Click the **VIEW** tab. If necessary, in the Show group, enable the **Ruler** option. The option is enabled and the ruler is visible when there is a check mark in the box. The horizontal ruler is displayed at the top of the document window, and the vertical ruler is displayed at the left side of the document window.
5. Position the insertion point at the beginning of line 20. Press **Tab** three times. Although they do not appear on the ruler, default tabs are already set for every half inch. The three tab symbols are displayed in the document window.
6. Position the insertion point anywhere in line 3. At the left end of the ruler, click the **tab selector** until the Right Tab symbol is displayed, as shown in **Figure 13–27**.

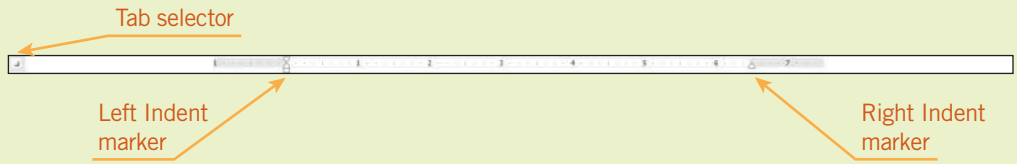


FIGURE 13–27
Tab selector and indent markers on the horizontal ruler

7. Click the **4-inch** mark on the horizontal ruler as shown in **Figure 13–28**. In line 3, position the insertion point in front of *April 11*, and press **Tab**. The date is now aligned at the right-aligned tab, which was set at the 4-inch mark on the ruler. In line 7, position the insertion point in front of *April 18*. Notice that no tab markers are displayed on the ruler. The tab you set in line 3 was applied to that paragraph only, and that paragraph has only one line of text.

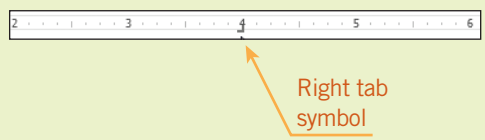


FIGURE 13–28
Tab symbol and indent markers on the ruler

8. Click the **tab selector** until the Center Tab symbol is displayed. Then click the **3-inch** mark on the ruler. Press **Tab**. The date is centered at the 3-inch mark on the ruler. Click and drag the **Center Tab** symbol all the way to the left and off the horizontal ruler to remove the tab setting.

9. Select all of the text in lines 7 through 20. Be sure to include the paragraph marker at the end of line 20. Click the **tab selector** until the Right Tab symbol is displayed. Then click the **4-inch** mark on the ruler. The new tab setting is applied to all selected paragraphs. The date in line 7 is aligned with the new tab stop. In line 12, position the insertion point in front of *April 25*, and then press **Tab**.
10. Select lines 3 through 20. Be sure to include the paragraph marker at the end of line 20. Click and drag the **Right Indent** marker on the horizontal ruler, and position it at the **6-inch** mark on the ruler.
11. With lines 3 through 20 still selected, click and drag the **Left Indent** marker on the horizontal ruler to the **1/2-inch** mark on the ruler. Notice that the First Line Indent marker and the Hanging Indent marker also move. See **Figure 13–29**.

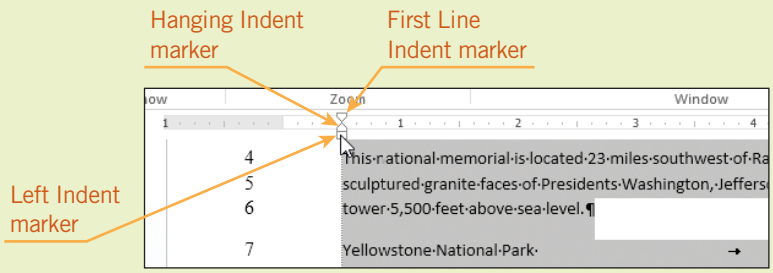


FIGURE 13–29
Indent markers on the horizontal ruler

12. With lines 3 through 20 still selected, drag the **First Line Indent** marker to the **1-inch** mark on the ruler. The first line of each selected paragraph is indented. Click the **Undo** button.
13. Click and drag the **Hanging Indent** marker to the **3/4-inch** mark on the ruler. The Left Indent marker moves with the Hanging Indent marker. All lines except the first line of each paragraph are indented from the left three-quarters of an inch. Deselect the text.
14. Click the **PAGE LAYOUT** tab, and then turn off the display of line numbers. Save the changes to the document, and then close the document.

ABOVE AND BEYOND

When you drag the Left Indent marker, the First Line Indent marker and the Hanging Indent marker also move. To change the margin when the indent markers are positioned with the marker, point to the middle of the margin markers until a two-headed arrow is displayed, and then you can drag the margin marker.

Formatting Bullets and Numbers

Bullets are used to list items when order does not matter—an unordered list. Numbered lists are used to identify steps that should be completed in a specific order, which are often referred to as an ordered list. Bulleted and numbered lists are automatically formatted with a hanging indent. Word automatically calculates the best distance for the hanging indent. You can change the bullet symbol, the number style, or the distance for the hanging indent in the Bullets and Numbering dialog box. When you press Enter to create a new paragraph, the new paragraph will include the same paragraph formats as the previous paragraph.

Step-by-Step 13.12

IC3
2-1.1.3
2-1.1.9
2-1.2.1
2-2.1.2
2-2.2.3

1. Open **Exposition** from the drive and folder where your Data Files folder is stored. Save the Exposition document as **Revised Exposition 1**, followed by your initials.
2. If necessary, show nonprinting characters. Display the line numbers.
3. Select all the text in lines 8 through 15. Click the **HOME** tab. In the Paragraph group, click the **Bullets** list arrow. Under *Bullet Library*, click the **black circle**. Each paragraph in the selection is formatted with a bullet symbol.
4. Select all the text in lines 17 through 20. Click the **Repeat** button on the Quick Access Toolbar. The last action (formatting bullets) is repeated, and bullets are applied to the selected text.
5. Select all the text in lines 22 through 28. In the Paragraph group, click the **Numbering** list arrow. Under *Numbering Library*, click the second option in the first row (**1.____, etc.**).
6. Deselect the text. In line 28, position the insertion point at the end of the word *Transportation*.
7. Press **Enter**. Word automatically formats the next paragraph with the number 8 and a hanging indent. Type **Water conservation**.
8. Press **Enter**. The next paragraph is formatted for item number 9. Click the **Numbering** button to toggle the option off.
9. Select all the text in lines 22–29. Note that the numbers will not be included in the selection. Click the **Bullets** button. The numbered list is converted to a bulleted list, with the same bullet symbols that were last applied. Deselect the text.
10. Save the changes to the document, and then leave the document open for the next Step-by-Step.

Applying Document Formats

Document formats are applied to an entire document. These formats include layout settings such as margins, page orientation, paper size, and page breaks; you will look at adjusting these settings in this lesson. More document formats will be covered in Lesson 16. Most of the document formats can be accessed in the Page Setup group on the PAGE LAYOUT tab.

The margin and page orientation formats you choose should be based on the purpose and content of the document and also on the paper size. If you want more or less content to fit on a page, you can modify the margin settings. The default margin settings are one inch for top, bottom, left, and right margins, but you can easily change those settings.

Portrait orientation formats the content of the document with the short edge of the page at the top. This is the default setting. You can change to ***landscape orientation***, which formats the content of the document with the long edge of the page at the top. Your on-screen document accurately reflects the page orientation you choose.

When you fill a page with text or graphics, Word automatically begins a new page by inserting a ***soft page break***. You can also break pages manually by inserting a ***manual page break***, which forces a page break at a specific location, regardless of how much text or how many graphics are on the page. The location of a soft page break will change when you add or delete text so that each page remains completely filled with text. A manual page break will remain where you insert it until it is deleted.

In Print Layout, Outline, and Draft views, the page break is indicated with a dotted line across the page. In Read Mode view the dotted line does not appear, but the pages actually look like separate sheets of paper, so you will clearly see where page breaks are located. In Web Layout view, the document is usually displayed as one long page without page breaks.

VOCABULARY

portrait orientation

landscape orientation

soft page break

manual page break

QUICK TIP

The keyboard shortcut for inserting a manual page break is Ctrl+Enter.

Step-by-Step 13.13

IC3
2-1.1.3
2-1.1.4
2-2.2.1

1. If necessary, open the **Revised Exposition 1** document from your solution files. Save the Revised Exposition 1 document as **Revised Exposition 2**, followed by your initials. If necessary, show nonprinting characters and line numbering.
2. Position the insertion point at the beginning of line 21. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **Breaks** button to show a list of options. Under *Page Breaks*, click **Page** to create a manual page break. The paragraph and all of the text below the paragraph is now displayed on page 2 of the document.
3. Click the **VIEW** tab. In the Zoom group, shown in **Figure 13–30**, click the **Multiple Pages** button.

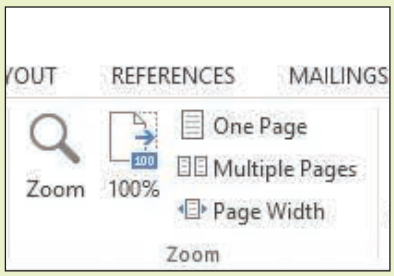
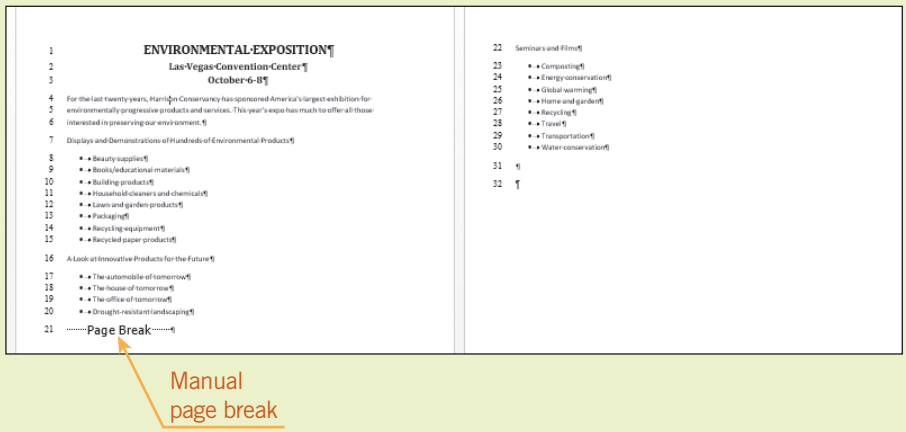


FIGURE 13–30
Zoom group on the VIEW tab

4. The nonprinting characters reveal a page break, as shown in **Figure 13–31**.

FIGURE 13–31
Manual page break in a document

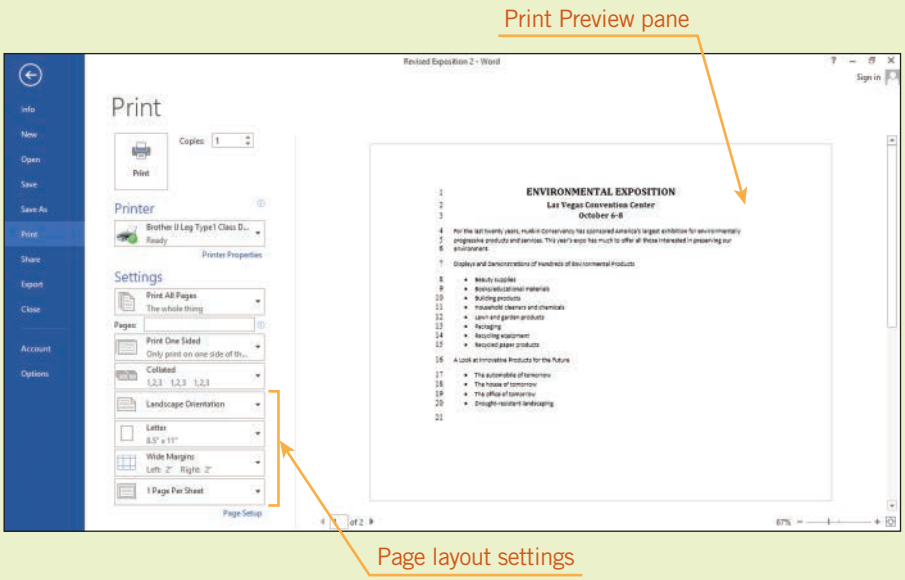


5. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **Size** button to show the page size options. Click the **A5** option. The layout of the content in the document window adjusts to the new page size, but the page break does not move.
6. Click the **Size** button again, and then click **Letter 8.5" × 11"** to return to the default setting.
7. In the Page Setup group, click the **Orientation** button, and then click **Landscape**. The content still fits on two pages.
8. In the Page Setup group, click the **Margins** button to show the options. Click **Wide**. The margins are adjusted in the document window.
9. Position the insertion point at the beginning of the document. Click the **FILE** tab, and then click **Print**. The Print Preview pane shows the document in landscape orientation. Note that the page orientation, paper size, and margin settings are also displayed as shown in **Figure 13–32**.

QUICK TIP

You can also change margins by dragging the margin markers on the ruler.

FIGURE 13–32
Page Layout settings in Backstage view



10. In the middle pane, under *Settings*, click **Landscape Orientation**, and then click **Portrait Orientation**. The Print Preview pane shows the new orientation.
11. When the orientation setting is changed, the Margins setting changes from Wide Margins to Custom Margins. Under *Settings*, click **Custom Margins**, and then click **Moderate**. Press **Esc** to exit Backstage view.
12. Click the **HOME** tab. Position the insertion point in front of the page break. Press **Delete** to remove the page break. Then press **Delete** again to remove the blank paragraph that was inserted when the manual page break was created.
13. Click the **VIEW** tab. In the Zoom group, click the **One Page** button.
14. Turn off the display of line numbers. Save the changes to the document, and then close the document. Leave Word open for the next Step-by-Step.

ABOVE AND BEYOND

To get your document content to fit on a page, you may need to create custom margins. On the PAGE LAYOUT tab, in the Page Setup group, click the Margins button. At the bottom of the list of options, select Custom Margins to open the Margins tab in the Page Setup dialog box. Here you can enter custom settings for each of the four margins.

Using Format Painter

When you apply multiple character or paragraph formats to text, and you need to repeat those formats throughout the document, you want the formats to be consistent. You can use the ***Format Painter*** button to quickly copy the formatting to other text and objects. Format Painter copies and applies font and paragraph formatting as well as some basic graphic formatting, such as borders, fills, and shading, which you will learn more about in Lesson 16.

VOCABULARY

Format Painter

Step-by-Step 13.14



IC3
2-1.1.3
2-1.1.9
2-1.2.2
2-2.2.1
2-2.2.2

1. Open the **Garden** document from the drive and folder where your Data Files folder is stored. Save the Garden document as **Revised Garden**, followed by your initials.
2. If necessary, show nonprinting characters. Display the line numbers. Note that Word automatically creates a soft page break to wrap the text to a second page. Manual page breaks are visible when you show nonprinting characters, but no marks are displayed for soft page breaks.
3. Select all the text in line 12. Be sure to include the ending paragraph marker in the selection. Click the **HOME** tab. Note that the highlighted Bold button in the Font group indicates that the font is formatted. Click the **Underline** list arrow and you will see that the Wave underline format is highlighted. Click anywhere in the document window to close the Underline list.
4. With the text still selected, on the HOME tab, in the Clipboard group, click the **Format Painter** button. The mouse pointer changes to show a paintbrush when positioned over text.

5. Scroll down to the bottom of page 1. In line 28, click the first word, **Tips**. The character formats are applied only to the one word. Also, the mouse pointer no longer displays a paintbrush, so you cannot continue copying the formats.
6. Scroll back to line 12 and select all the text in the line, including the paragraph marker. Double-click the **Format Painter** button. The mouse pointer changes to show a paintbrush, and because you double-clicked the Format Painter button, you now have unlimited opportunities to copy the formats.
7. Scroll down to the bottom of page 1. Click and drag the mouse pointer to select all of the text in line 28. The copied character and paragraph formats are applied to all of the selected text as you drag the mouse pointer.
8. The mouse pointer still displays a paintbrush, so you can continue to use Format Painter. Scroll down to page 2. Click and drag the mouse pointer to select all of the text in line 38.
9. Click the **Format Painter** button. Format Painter is toggled off, and the mouse pointer no longer displays a paintbrush.
10. Scroll to the top of the document. Select lines 3 through 11, including the paragraph markers at the end of the paragraphs. Format the selected text as follows:
    a. Press **Ctrl+J** to justify the alignment of text.
    b. Press **Ctrl+5** to change the line spacing to 1.5 lines.
    c. In the Font group, click the **Font Color** list arrow, and then under *Theme Colors* click the **Dark Blue, Text 2** color.
    d. In the Paragraph group, click the **Line and Paragraph Spacing** button, and then click **Add Space Before Paragraph**.
11. With the paragraphs still selected, double-click the **Format Painter** button. Then click and drag the mouse pointer over all the text in lines 13 through 27, line 29, and lines 39 and 40. Be sure to select the paragraph markers to make sure both the character and paragraph formats are copied to the selected text. Press **Esc** to toggle off Format Painter.
12. In line 29, double-click the first word, **Follow**, to select it. Then double-click the **Format Painter** button. Because a paragraph marker is not included in the selection, you have only copied the character formats. Then drag the mouse pointer across the bulleted list and the numbered list to copy the character formats. Press **Esc** to toggle off Format Painter.
13. Select lines 30 through 37 and lines 41 through 46, and apply the **Dark Blue, Text 2** font color. Deselect the text.
14. Turn off the display of line numbers. Save the changes, and close the document.

QUICK TIP

You can use Format Painter to copy formats from one Word document to another Word document.

SUMMARY

In this lesson, you learned:

- When you add text while in Insert mode, the new characters are inserted between existing text. When text is entered in Overtype mode, the new text replaces existing text.
- The Undo, Redo, and Repeat commands make editing easy when you make mistakes, change your mind, or repeat actions.
- Selected text can be copied or moved from one location in a Word document to a new location in the same document, to a different Word document, or to another application.
- When you use the Cut, Copy, and Paste commands, Word stores the selected text on the Clipboard.
- The Find command and the Navigation Pane make searching for text easy and efficient. The Replace command can replace multiple occurrences of search text automatically.
- Options can be enabled so that Word checks spelling and grammar as you enter text.
- Font styles, text color, and underline are examples of character formats, and you can apply multiple character formats at the same time.
- Formatting a paragraph for left, center, right, or justified alignment positions the text appropriately between the left and right margins.
- You can use the ruler to format tabs and indents.
- The Bullets and Numbering feature automatically adds and formats bullets and numbers in lists.
- The page orientation determines how the document is printed on the page. Adjusting the margins affects the blank space around the edges of the page.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. Drag-and-drop editing makes moving text quick and easy, especially when you are moving the text short distances.

T F 2. If you undo an action and then change your mind, you can reverse the undo action by using the Undo command again.

T F 3. When you hold down Ctrl as you drag and drop text, the selected text will be copied instead of moved.

T F 4. Formats can be applied before you enter text in a document.

T F 5. When an item is pasted from the Clipboard, the item is automatically deleted from the Clipboard.

T F 6. Word defines a paragraph as any amount of text that ends with a paragraph marker.

T F 7. You can store up to 50 items on the Clipboard task pane.

T F 8. Word's default tabs are set at every quarter inch.

T F 9. The location of a manual page break automatically changes when you add or delete text.

T F 10. A wavy red line under a word means the word is not listed in Word's dictionary.

MULTIPLE CHOICE

Select the best response for the following statements.

1. _____ refers to how text is positioned between the left and right margins.
   A. Alignment
   B. Line format
   C. Line adjustment
   D. Line spacing
2. When searching for text in a document, you can _____.
   A. search for all occurrences of the search words
   B. search for all occurrences of a specific format
   C. search for whole words only
   D. all of the above
3. _____ orientation formats the content of the document with the long edge of the page at the top.
   A. Horizontal
   B. Landscape
   C. Layout
   D. Portrait
4. A _____ indent formats the first line of text at the left margin, and all other lines of the paragraph are indented to the right of the first line.
   A. left
   B. first line
   C. hanging
   D. right
5. Paragraph formats include _____.
   A. adjusting the blank space between lines of text
   B. tabs and indents
   C. character formats
   D. A and B

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. You can use the _____ command to reformat multiple occurrences of text throughout the document.
2. In _____ mode, existing text moves to the right to make room for the new text.
3. _____ are the blank spaces around the edges of a page.
4. Word automatically inserts a(n) _____ when a page is full.
5. A(n) _____ is the design of the typeface in your document.
6. To represent one or more characters in a search, you can use a(n) _____ in the search text.
7. The _____ feature automatically corrects errors as you enter text.
8. The _____ feature suggests the spelling for frequently used words and phrases.
9. The _____ tab setting aligns text evenly on either side of the tab position.
10. In a(n) _____, as you begin typing the string of characters for which you want to search, Word highlights the matches for the character string in the document.

PROJECTS

PROJECT 13–1

2-1.1.2
2-1.1.5
2-1.1.9
2-1.3.5
2-2.2.1
2-2.2.2
2-2.2.3

1. Open **Viewpoint** from the drive and folder where your Data Files folder is stored. Save the Viewpoint document as **Revised Viewpoint**, followed by your initials.
2. Select the last two lines of text in the document, including the paragraph markers. Cut the selected text to the Clipboard, and then paste the contents at the top of the document.
3. Insert a manual line break at the end of the instructor's name. Type your first and last names, press **Enter**, and then type the current date.
4. Select the first four paragraphs, and remove the space after the paragraphs.
5. Select the entire paragraph, beginning with the sentence *The debate about.* Change the line spacing to double-spaced (2.0).
6. Insert a default 1/2-inch tab at the beginning of the paragraph.
7. One possible grammar error and three possible misspelled words are flagged. Make the necessary corrections. The instructor name is spelled correctly. If you do not see any flags for potential grammar and spelling errors, recheck the document.
8. Find the second occurrence of the word *TiVo.* Select the whole sentence with the second occurrence of *TiVo*, and then delete the sentence.
9. Find the word *teammate,* and then replace the word with **coach**.
10. Find the word *execute.* Use the Thesaurus to find synonyms for *execute*, and select a synonym to replace the word.
11. Select the title *My Viewpoint.* Center the title, and increase the font size three increments. Change the text case to uppercase.
12. Select the entire line with the instructor name at the top of the document. Delete the sentence. Undo the edit, and then redo the edit.
13. Save the changes, and close the document. Leave Word open for the next Project.
14. If you made changes to the Word Options settings in Step-by-Step 13.7, restore the Word Options settings to those that you noted in Steps 1 and 2.

PROJECT 13–2

2-1.1.5
2-1.1.9
2-1.2.1
2-1.2.2
2-1.3.5
2-2.1.2
2-2.2.1

1. Open **Career Goals** from the drive and folder where your Data Files folder is stored. Save the Career Goals document as **Revised Career Goals**, followed by your initials.
2. Select the heading *Career Goals.* Change the font style to Cambria, and change the font size to 16 points. Also apply the bold format.
3. Select all three paragraphs with text formatted with the red font color. Apply the numbering format to create a numbered list.
4. Select the first set of blue lines (four lines total), and apply a bullet format.
5. Select the second and third sets of blue lines (each set has three lines total), and use the Repeat button to apply the same bullet format you used in Step 4.
6. Select all the text in the document, and change the font color to Automatic (black).
7. Find all occurrences of *Before you* with a bold format and replace the text with **To** and a bold format. Before closing the Find and Replace dialog box, remove the format from the Find what and Replace with boxes.
8. Change the page orientation to landscape.
9. Save the changes to the document, close the document, and leave Word open for the next Project.

PROJECT 13–3

IC3 2-1.1.2 2-1.1.3 2-1.1.6 2-1.1.9 2-1.2.2 2-2.1.2 2-2.2.1 2-2.2.2 2-2.2.3

1. Open the document **Fall Schedule** from the drive and folder where your Data Files folder is stored. Save the Fall Schedule document as **Revised Fall Schedule,** followed by your initials.
2. If necessary, show nonprinting characters. Display the ruler and continuous line numbers.
3. Select lines 2 and 3, including the paragraph markers. Format a hanging indent at the 1/4-inch mark on the horizontal ruler.
4. Use Format Painter to copy the paragraph formats in lines 2 and 3 to all the other course descriptions (lines 9-10, 16-17, 23-24, and 30-31). Then toggle off Format Painter.
5. Select lines 4 through 7. Move the Left Indent marker on the horizontal ruler to the 1/2-inch mark on the ruler.
6. Use Format Painter to copy the paragraph formats in lines 4 through 7 to all the other course descriptions (lines 11-14, 18-21, 25-28, and 32-34). Then toggle off Format Painter.
7. In line 5, select the instructor's name (without the paragraph marker). Copy the selected text to the Clipboard. Then position the insertion point at the end of line 32. Insert a manual line break, and then paste the instructor name.
8. Select all the text and the paragraph marker in line 1. Apply the bold and double underline formats, and add space before the paragraph.
9. Use Format Painter to copy the character and paragraph formats in line 1 to all the other course titles (lines 8, 15, 22, and 29). Then toggle off Format Painter.
10. Using cut and paste or drag-and-drop editing, reorganize the information so the classes are listed alphabetically by class title.
11. Turn off the display of line numbers. Save the changes, and close the document.

PROJECT 13–4

IC3 2-1.1.9 2-1.2.2 2-2.2.1 2-2.2.2 2-2.2.3

1. Open the **Recreation Programs** document from the drive and folder where your Data Files folder is stored. Save the Recreation Programs document as **Revised Recreation Programs**, followed by your initials.
2. Change the page orientation to landscape. Change the margins to the Wide setting (top and bottom 1 inch and the left and right margins to 2 inches).
3. Center the first seven lines of text, beginning with *Pine Creek Recreation Commission* and ending with *Mt. Washington Recreation Center.*
4. Insert a manual page break in front of the word *Contents.* Then center the paragraph containing the heading.
5. Select all of the text below the *Contents* heading, and then set a right tab at the 6.5-inch mark on the horizontal ruler. Note that the tab has already been entered in front of the page number in each line of text, so the page numbers align on the right side of the document.
6. With the text still selected, remove the space after all the selected paragraphs.
7. Under the *Contents* heading, format the program listings as follows:
   a. Select the first three lines of text below the Contents heading *(Registration, Memberships,* and *Hours).* Apply the bold and italic formats, and change the size of the font to 12 points. Then repeat the formatting for the last two lines of text below the *Contents* heading *(Special Events* and *Community Meetings).*
   b. Select each of the headings for each age group *(ELEMENTARY PROGRAMS, TEEN PROGRAMS,* and *ADULT PROGRAMS*) and apply bold and underline formatting to the headings (including the page numbers). Change the size of the font to 12 points.
   c. Apply a 1/4-inch left indent to the lists of programs under each age group heading.
8. You decide that the first page could be spread out a little to fill up more of the page. Select all the text on the first page, and increase the font size by two increments.
9. Insert three manual line breaks in front of the first line of text *Pine Creek Recreation Commission.* Insert two manual line breaks in front of *Clinton Community Center.*
10. Save the changes to the document, and then close the document.

TEAMWORK PROJECT

2-1.1.9
2-1.2.2

The fonts you use to format a document can be divided into two types: *serif* and *sans serif*. Research these two types of fonts to learn more about them.

1. Choose a partner and together research serif typefaces and sans serif typefaces. Use the Web or other references to read about typography, the art of designing typefaces.
2. When you and your partner have completed your research, work with your partner to create a summary of your findings.
3. Create a new Word document, and save the document as **TP 13–1**, followed by your initials.
4. Type your answers to the following questions in separate paragraphs:
   a. What is a serif?
   b. What is the main difference between a serif font and a sans serif font?
   c. What type of typeface is recommended for body text? Why?
5. After answering each of the questions, select two different portions of the text in the document (such as the title or a paragraph with the answer to a question) and apply a serif font to one portion and a sans serif font to the other selected text.
6. With your partner, compare the different fonts that you have applied and decide which of the fonts is most readable and appropriate for each section of text.
7. Save the changes to the document, and then close the document.

CRITICAL THINKING

CRITICAL THINKING 13–1

2-1.1.2

You have been copying multiple items to the Clipboard. You learned in this lesson that after you open the Clipboard pane, it stores multiple items. You can automatically copy items to the Clipboard without displaying the Clipboard task pane. Use the Help feature to learn how to do this.

1. Create a new Word document, and save the document as **CT 13–1**, followed by your initials.
2. Write a paragraph describing how you can automatically copy items to the Clipboard without opening the Clipboard task pane.
3. Write a second paragraph explaining whether you would use this feature and why.
4. Save the changes to the document, and then close the document.

CRITICAL THINKING 13–2

2-2.2.1

If you completed Project 13–4, you had to add blank lines to center the text vertically on the first page of the Recreation Programs document. There is another way to center text vertically. Use Word's Help feature to find out how to do this.

1. Create a new Word document, and save the document as **CT 13–2**, followed by your initials.
2. Write a brief explanation of the steps you need to take. Explain what would happen to the second page of the Revised Recreation Programs Guide document if you followed these steps.
3. Describe at least two other types of documents in which you could use this feature.
4. Save the changes to the document, and then close the document.

ONLINE DISCOVERY

Selecting and copying text on a Web page is often similar to selecting and copying text in a Word document. Depending on the browser, you can usually select, copy, and paste Web page content just as you do in Word.

1. In your browser of choice, open a Web page that shows an article with several paragraphs of text.
2. Refer to Table 13–1, and test all the select text options listed in the table, noting whether or not each option works to select text in the Web page.
3. Create a new Word document, and save the document as **OD 13–1**, followed by your initials.
4. Test copying text from the Web page and then pasting the copied text into the Word document. Delete the pasted content.
5. Write a brief summary describing what is similar when selecting and copying text in Word and in a browser.
6. Save the changes to the document, and then close the document.

IC3 2-1.1.2 2-1.1.9

JOB SKILLS

In this lesson you learned to use the proofing tools to help you avoid spelling and grammar errors. Although these features are very helpful, you cannot rely on them to find all errors. You have just prepared a news release for your manager, but before you give your manager access to the document, you want to make sure there are no errors in the document.

1. Create a new Word document, and save the document as **JS 13–1**, followed by your initials.
2. Create a list of steps you will take to proofread the document.
3. Save the changes to the document, and then close the document.

EXPLORE AND SOLVE

In this lesson you learned to use tab stops to format the text alignment. Explore the options for formatting the space between tabs with "leader" characters (dots and dashes) to help line up information.

1. Open **Revised Recreation Programs** from your solution files. Save the Revised Recreation Programs document as **ES 13–1**, followed by your initials.
2. Toggle off the underline format for the three age group headings.
3. Change the format of the tabs so that leader characters appear between the tabs. Be creative and use different leaders for the tabs.
4. Save the changes to the document, and then close the document.

IC3 2-1.2.2 2-2.1.1



Estimated Time:
2 hours

LESSON 14

Sharing Documents

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Track changes and add comments.
- Show and hide markup and accept and reject changes.
- Customize print settings and properties, and pause and cancel print jobs.
- Troubleshoot printing problems.
- Prepare documents for electronic distribution.
- Save documents in PDF or XPS format.
- Share documents.
- Protect documents by restricting access, formatting, and edits.

DATA FILES

To complete this lesson, you will need these data files:

Facilities.docx

Furniture.docx

Safety.docx

Walking.docx

Workstations.docx

WORDS TO KNOW

blog

case sensitive

Cloud

collating

comment

duplex printing

encryption

hard copy

markup

metadata

Portable Document Format (PDF)

print queue

read-only document

reverse printing

SkyDrive

soft copy

XML Paper Specification (XPS)

Microsoft product screenshots used with permission from Microsoft Corporation.

The development of a document may involve multiple team members. If you collaborate with others to create or edit a document, you can take advantage of many features in Word that help individuals contribute more effectively to the development of the document.

Revising Documents

In a team effort to create a document, it is common to allow team members to review and edit the document. Tracking changes with revision marks makes it easy to find edits and identify the source of the edits. Adding comments is another useful feature that allows reviewers to provide feedback and express opinions without changing the content of the document. The revision marks and annotations that appear in a document are referred to as ***markup***.

VOCABULARY
markup

Tracking Changes

When the Track Changes feature is toggled on, all insertions, deletions, and format changes are indicated with revision marks such as a change in font color, underlines, strikethrough formats, and balloons in the margins. These revision marks are easy to recognize, and they even identify who made the changes and when the changes were made.

Step-by-Step 14.1

IC3
2-1.1.7
2-6.1.1
2-6.1.3

1. Start **Word**. Open the **Workstations** file from the drive and folder where your Data Files folder is stored. Save the Workstations document as **Revised Workstations 1**, followed by your initials.
2. Confirm that the document is displayed in Print Layout view. Click the **REVIEW** tab. If necessary, in the Tracking group, click the **Display for Review** list arrow and then select **Simple Markup**. Also, if necessary, disable the Show Comments button so your settings match those shown in **Figure 14–1**.

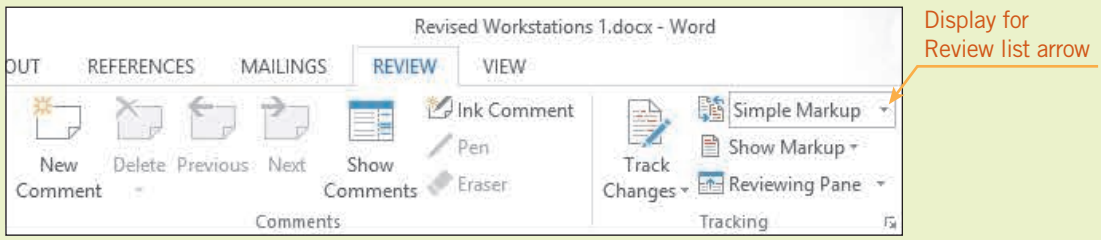


FIGURE 14–1
Tracking group on the REVIEW tab

3. In the Tracking group, click the **Dialog Box Launcher** to display the Track Changes Options dialog box shown in **Figure 14–2**.

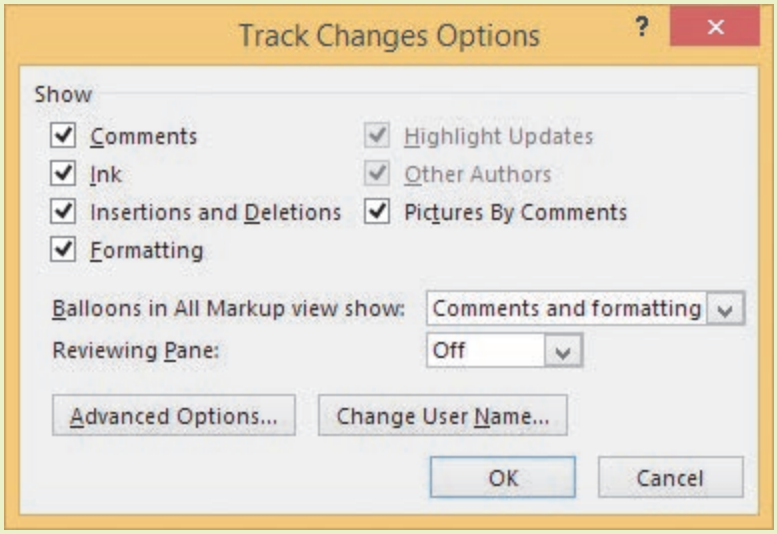


FIGURE 14–2
Track Changes Options dialog box

4. Click **Advanced Options** to open the Advanced Track Changes Options dialog box shown in **Figure 14–3**. Compare your settings, and make changes if necessary, so your settings match the default settings shown in Figure 14–3. Click **OK** twice to close each of the dialog boxes.

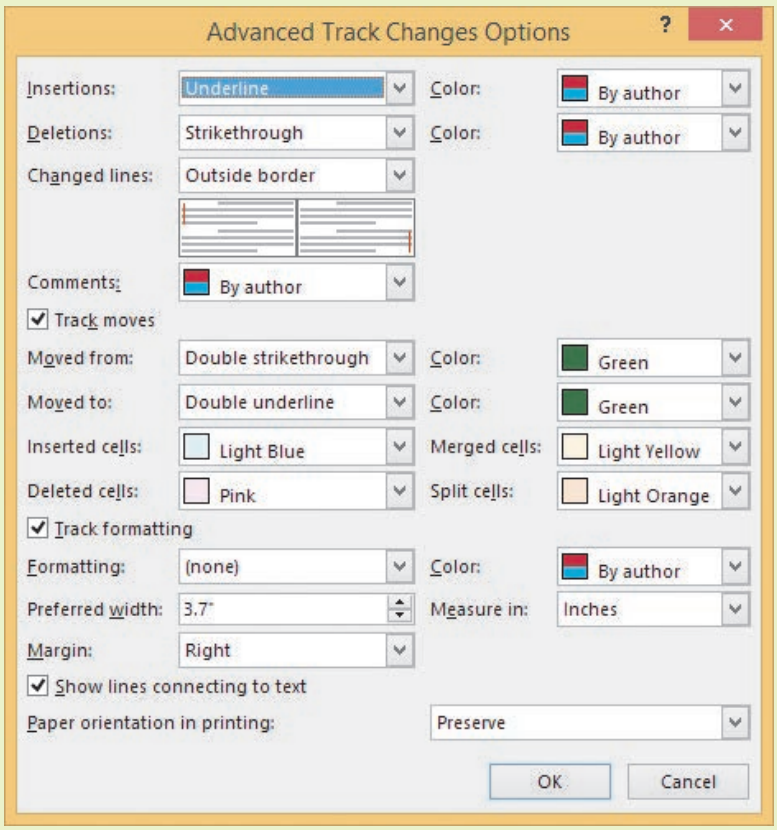


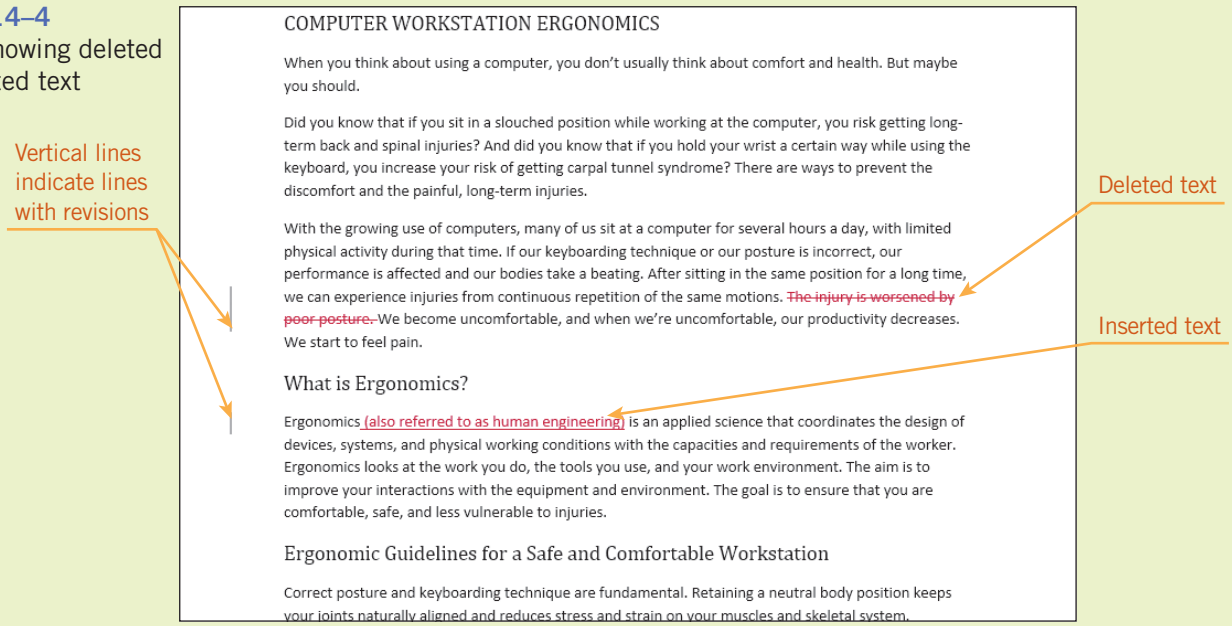
FIGURE 14–3
Advanced Track Changes Options dialog box

5. In the Tracking group, click the top half of the **Track Changes** button to toggle on the feature. The feature is on when the button has a background highlight. In the fourth paragraph, which begins *With the growing use…*, delete the next to last sentence: **The injury is worsened by poor posture**. Note that the text is removed from the paragraph and a red vertical line appears in the left margin next to the lines that were changed in the paragraph.
6. In the Tracking group, click the **Display for Review** list arrow (Simple Markup) and then click **All Markup**. The deleted text now appears in its original location. The font is now red and a strikethrough format has been applied.
7. In the first sentence under the heading *What is Ergonomics?*, position the insertion point after the letter *s* in the word *Ergonomics*. Press the **spacebar** and then type **(also referred to as human engineering)**.
8. Compare the revision marks in your document to those shown in **Figure 14–4**. With default settings, deleted text is identified with a strike-through and the new text is identified in a different font color and an underline. Your color may differ. A vertical mark in the left margin of the document indicates the lines of text that contain revisions.

ABOVE AND BEYOND

To add the Track Changes button to the status bar, right–click the status bar and then click the Track Changes option. You can click the Track Changes button to toggle the feature on and off.

FIGURE 14–4
Markup showing deleted and inserted text



9. Position the mouse pointer over the deleted text. A ScreenTip appears showing a user name, a date, and a time. This information identifies the reviewer who made the change and when the change was made. Next, position the mouse pointer over the inserted text to display the ScreenTip.

10. In the Tracking group, click the **Dialog Box Launcher** to open the Track Changes Options dialog box. Click **Change User Name**. The Word Options dialog box shown in **Figure 14–5** opens. Make note of the user name and the initials. Then change the user name to **Reviewer A** and change the initials to **RA**. Click **Always use these values regardless of sign in to Office.** to enable the option. Click **OK** to accept the changes. Click **OK** to close the Track Changes Options dialog box. This setting change now applies to all Office applications.

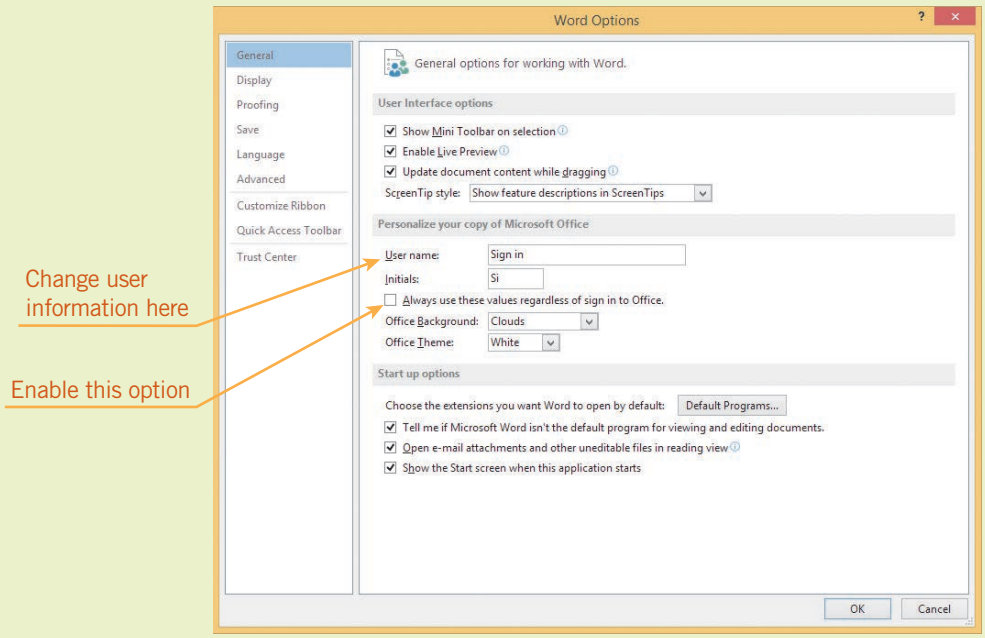
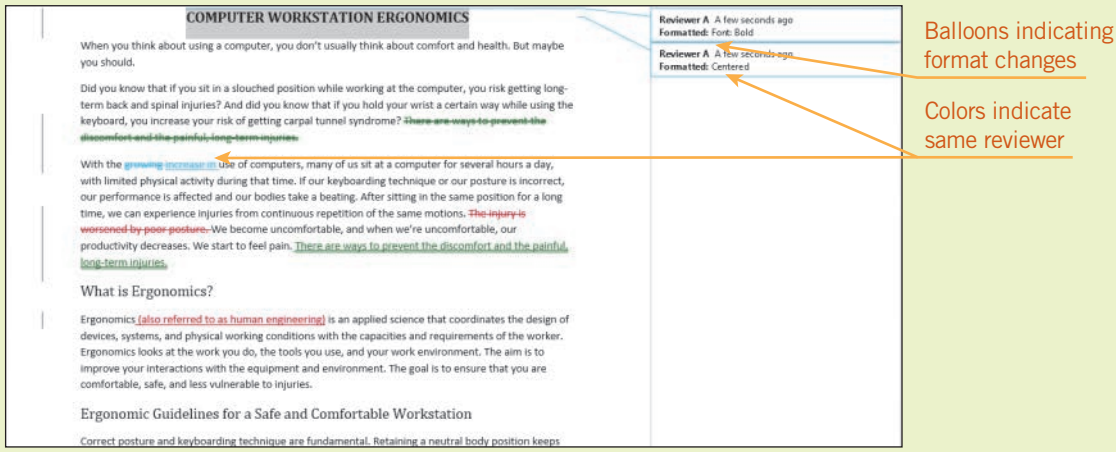


FIGURE 14–5
Word Options dialog box

11. Make the following additional edits:
    a. In the fourth paragraph that begins *With the growing use…*, double-click the word **growing** to select the word, and then type **increase in**. Markup indicates that the word *growing* is deleted and the new text is inserted. The markup is displayed in a different font color to distinguish that this edit is from a different reviewer. When the ScreenTip appears, you will see that the new reviewer name is displayed.
    b. In the third paragraph that begins *Did you know…*, select the whole sentence: **There are ways to prevent the discomfort and the painful, long-term injuries.** at the end of the paragraph. Drag and drop the selected sentence to move it to the end of the next paragraph that begins *With the increase in….* At the original location, the edited text is shown in a green font with a double-strikethrough. At the new location, the inserted text is shown in a green font with a double underline. The green font indicates moved content.

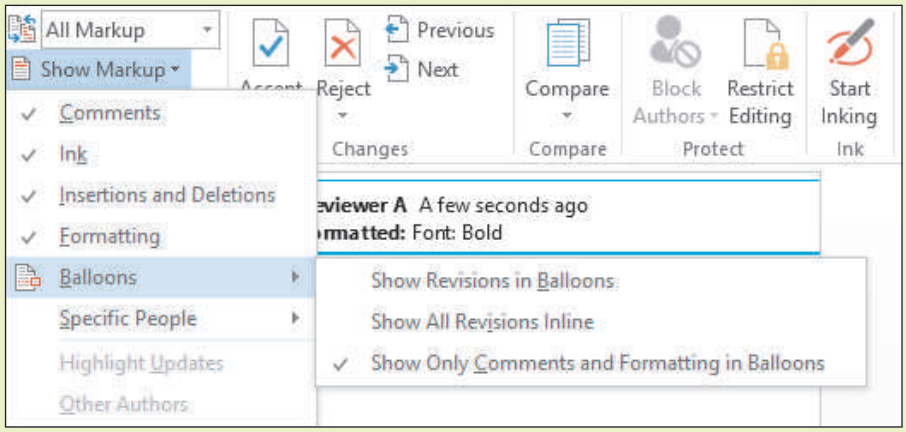
c. At the top of the document, select all the text in the title **COMPUTER WORKSTATION ERGONOMICS**. Using the buttons on the Mini toolbar and in the Paragraph group on the **HOME** tab, apply the bold format and center the text alignment. Notice that the changes for the character and paragraph formats are identified in balloons in the right margin as shown in **Figure 14–6**. The border color for the balloons matches the color for the markup related to this reviewer.

FIGURE 14–6
Markup showing format changes



12. Click the **REVIEW** tab. In the Tracking group, click the **Show Markup** button, and then point to *Balloons*. The submenu shown in **Figure 14–7** is displayed.

FIGURE 14–7
Show Markup Balloons options



a. In the submenu, click **Show Revisions in Balloons**. In addition to the balloons for the format changes, new balloons are displayed to identify the moved and deleted text.

b. Click the **Show Markup** button, point to *Balloons*, and in the submenu click **Show All Revisions Inline**. All the revisions are displayed in the lines of text. There is no markup to indicate format changes.

c. Click the **Show Markup** button, point to *Balloons*, and in the submenu click **Show Only Comments and Formatting in Balloons**.

13. In the Tracking group, click the **Dialog Box Launcher** to open the Track Changes Options dialog box. Click **Change User Name**. Change the user name and the initials back to the original setting noted in Step 10, and disable the option **Always use these values regardless of sign in to Office**. Then click **OK** twice to close each of the dialog boxes. Click the **Track Changes** button to toggle off the feature.
14. Save the changes, and leave the document open for the next Step-by-Step.

Adding Comments

A ***comment*** is an annotation that the author or a reviewer adds to the document. A comment can be inserted anywhere in a Word document. You can choose how the comments are displayed in the document and whether or not comments will be included when you print the document.

VOCABULARY
comment

Step-by-Step 14.2

IC3
2-6.1.1
2-6.1.3

1. If necessary, open the **Revised Workstations 1** file from your solution files. Save the Revised Workstations 1 document as **Revised Workstations 2**, followed by your initials.
2. If necessary, click the **REVIEW** tab. In the Tracking group, click the **Track Changes** button to enable the feature. Also, if necessary, change the Display for Review setting to **All Markup**.
3. Under the heading *What is Ergonomics?*, select the new text you entered: **(also referred to as human engineering)**. In the Comments group, click the **New Comment** button, shown in **Figure 14–8**.

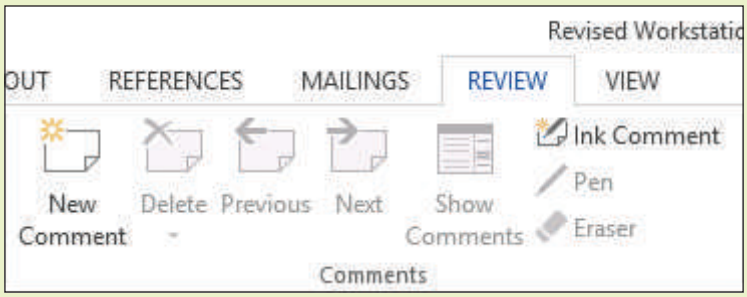
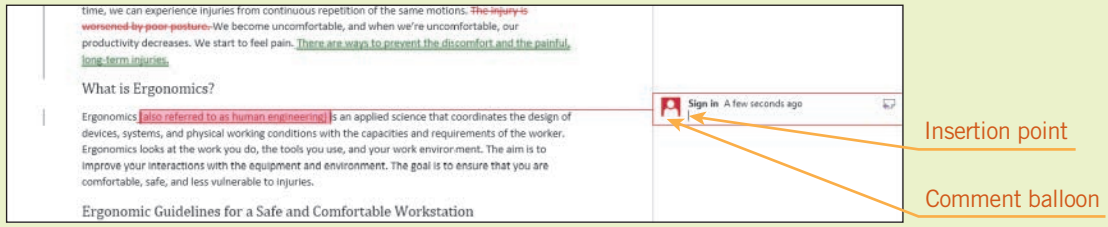


FIGURE 14–8
Comments group on the REVIEW tab

4. Shading highlights the text you selected, and a line leads to the comment balloon in the margin, as shown in **Figure 14–9**.

FIGURE 14–9
Markup showing a comment balloon



5. The name at the beginning of the comment text indicates the author of the comment, based on the user information provided in the Word Options dialog box. The insertion point is positioned in the comment balloon. Type **Because it involves human factors, it is often referred to as human engineering...** in the comment box. Then click outside the comment box.
6. Scroll to the bulleted list at the bottom of the first page. In the first bulleted item, position the insertion point after the word *floor*. Click the **New Comment** button, and then type **My keyboarding instructor made us keep our feet flat on the floor!** in the comment balloon. Because you did not select text, the comment is connected to the word closest to the location of the insertion point.
7. Position the mouse pointer over either one of the comments highlights to display the ScreenTip with the reviewer name and the date and time the comment was added to the document.
8. In the Tracking group, click the **Reviewing Pane** list arrow, and then click **Reviewing Pane Vertical**. The changes and comments are now displayed in a pane at the left side of the document as shown in **Figure 14–10**. You can scroll through the list to view the changes, and you can also edit the comments in the Reviewing pane.

QUICK TIP

When you move or copy text with a comment, the comment markup is pasted with the text.

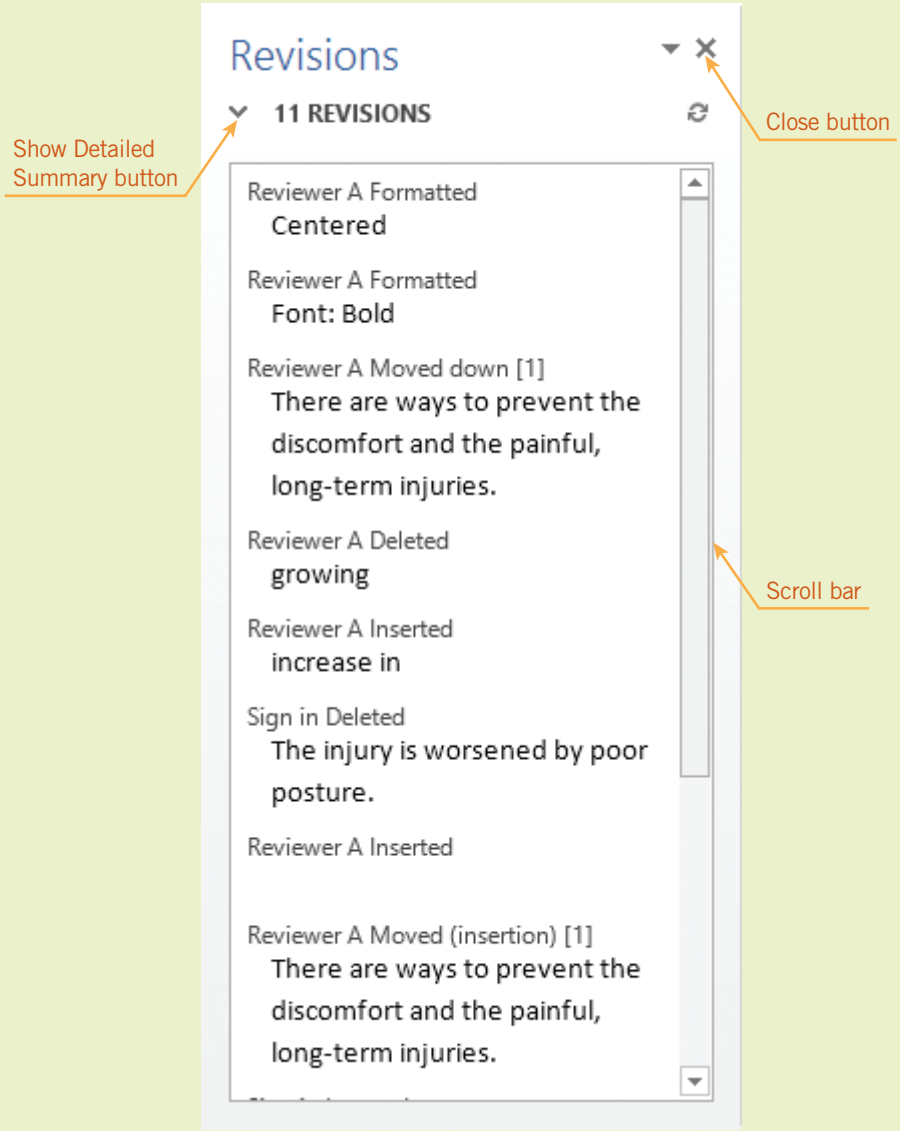


FIGURE 14–10
Vertical Reviewing pane

9. Compare your screen to Figure 14–10. At the top of the Reviewing pane is a summary that shows the number of revisions. To see the details about the summary, click the **Show Detailed Summary** button. To hide the summary details, click the **Hide Detailed Summary** button to hide the summary details.
10. In the Tracking group, click the **Reviewing Pane** list arrow, and then click **Reviewing Pane Horizontal**. The changes and comments are now displayed in the Reviewing pane at the bottom of the document window.
11. On the upper-right corner of the Reviewing pane, click the **Close** button to close the Reviewing pane.
12. Save the changes to the document, and leave the document open for the next Step-by-Step.

Showing and Hiding Markup

Multiple comments and revisions often clutter the document and make it difficult to read the content. Moreover, if there are multiple users, the revisions may be even more complex to review. As you have already learned, in addition to choosing Simple Markup or All Markup settings, you can further customize the markup view by choosing from several options to show the markup. For example, you can choose to show only the edits from a specific reviewer, or you can choose to view only the comments added to the document. To see what the final document will look like, you can hide the entire markup.

There is no limit on the number of reviewers for a document. Word will assign a different color for each of the first eight reviewers. The colors will be reused for additional reviewers beyond the first eight. You can still easily identify reviewers by their user names in the markup ScreenTips.

Step-by-Step 14.3

IC3
2-1.1.7
2-6.1.1

1. If necessary, open the **Revised Workstations 2** file from your solution files. If necessary, click the **REVIEW** tab.
2. In the Tracking group, click the **Show Markup** button. A menu appears, and you can choose the type of revisions you want to review. All types of markup with a check mark will be displayed in the document. Point to *Specific People* to show the names of the reviewers, as shown in **Figure 14–11**.

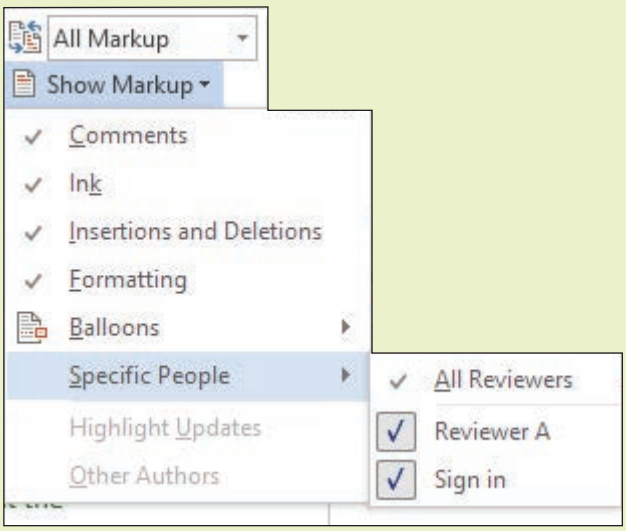


FIGURE 14–11
Show Markup options with the names of the reviewers

3. Click **Reviewer A** to uncheck that reviewer name. Scroll through the document. Now only the changes and comments from the first reviewer are displayed in the document.
4. Click the **Show Markup** button, point to *Specific People*, and then click **All Reviewers** to return to the default settings and display all comments and changes.

5. In the Tracking group click the **Display for Review** list arrow, and then click **No Markup**. The document is displayed on the screen exactly as it will print, with all the revisions accepted and the comments hidden. The markup has not been accepted or removed from the document; it just does not show on the screen.
6. Click the **Display for Review** list arrow again, and then click **All Markup**.
7. Leave the document open for the next Step-by-Step.

Accepting and Rejecting Changes and Responding to Comments

After changes and comments are added to a document, the edited document is usually passed on to another person, either the original author or another reviewer, to make a decision about the revisions and comments. That person can decide whether to accept or reject the changes, and he or she can also remove the comments from the document. The Next and Previous buttons in the Comments group help you quickly navigate through the comments in the document. You can mark a comment as "Done," reply to the comment, or delete the comment.

When the edits are complete, you can apply a Marked as Final status. Then when you share the document, those who review the document will know they are viewing the final version. When a document is marked as final, editing is disabled and markup is not visible. The file becomes a ***read-only document***, which permits others to open and view the document, but they are unable to make any changes to the document. Be aware, however, that it is possible for anyone to easily remove the Marked as Final status.

VOCABULARY
read-only document

Step-by-Step 14.4

IC3
2-1.3.6
2-6.1.1
2-6.1.2

1. If necessary, open the **Revised Workstations 2** file from your solution files. Save the Revised Workstations 2 document as **Revised Workstations 3**, followed by your initials. If necessary, change to **Print Layout** view, and then click the **REVIEW** tab and enable **Track Changes**.
2. Position the insertion point at the beginning of the document. In the Comments group, click the **Next** button. The insertion point moves to the beginning of the text in the first comment balloon. Right-click the **balloon** and in the shortcut menu, click **Mark Comment Done**. The comment remains in the document but now appears in a dim grey font.
3. In the Comments group, click the **Next** button to move to the second comment in the document. In the balloon, click the **Reply** button and type **Mine too!** in the comment box.
4. In the Comments group, click the **Previous** button twice to move back to the first comment.

5. Reposition the insertion point at the beginning of the document. In the Changes group, shown in **Figure 14–12**, click the **Next** button. The insertion point moves to the first revision in the document, which is the bold format applied to the first paragraph of text.

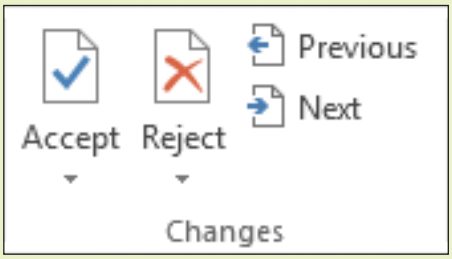


FIGURE 14–12
Changes group on the REVIEW tab

6. Click the **Next** button. The insertion point moves to the second change in the document, which is the center alignment format for the same paragraph. Click the **Next** button again. The insertion point moves to the text at the end of the paragraph that begins *Did you know*.
7. Click the **Next** button. The word *growing* is selected. In the Changes group, click the top half of the **Accept** button. The selected text is deleted, and the next revision is selected.
8. In the Change group, click the **Next** button. The sentence *The injury is worsened by poor posture* is selected. In the Changes group, click the top half of the **Reject** button (not the button arrow). The original sentence is restored.
9. Click the **Next** button three times. The Next Change command locates the first comment. In the Comments group, click the **Delete** list arrow. Click **Delete All Comments in Document** to remove all the comments.
10. In the Changes group, click the **Accept** list arrow and then click **Accept All Changes and Stop Tracking**. All revisions are accepted and in the Tracking group, the Track Changes feature is toggled off.
11. Click the **FILE** tab. If necessary, click **Info**. Click the **Protect Document** button. In the submenu, click **Mark as Final**. When prompted to mark the document as final and then save the document, click **OK**. A second prompt appears confirming the Marked as Final status. Click **OK**. Note that the Backstage view now displays a note indicating the document has been marked as final, as shown in **Figure 14–13**.

QUICK TIP

If you do not want to review all of the changes and comments in sequence, show the Reviewing pane so you can scroll through the list and quickly locate the change or comment. When you click a comment in the Reviewing pane, the insertion point is moved to that location in the document window.

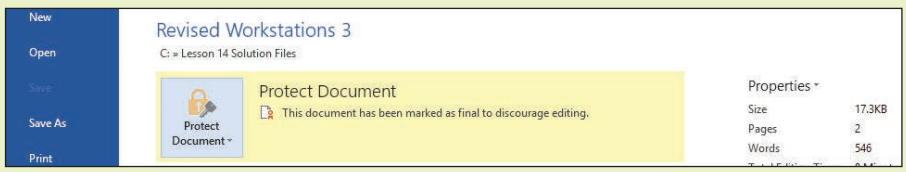


FIGURE 14–13
Marked as final status in Backstage view

12. Press **Esc** to exit Backstage view. Note that a yellow bar is displayed above the document window as shown in **Figure 14–14** indicating that the document has been marked as final. Also note that the Marked as Final icon is shown in the status bar.

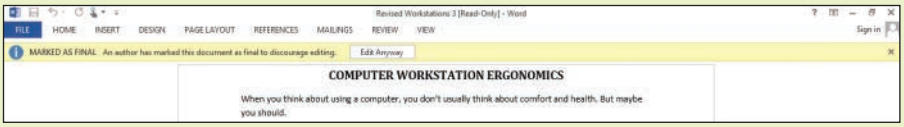


FIGURE 14–14
Marked as final status in document window

13. Select the first word in the document, and then press **Delete**. The selected text is not removed because the document is a read-only document. In the yellow bar above the document window, click **Edit Anyway**. The Mark as Final status is removed. With the first word still selected, press **Delete**. The selected text is removed. On the Quick Access Toolbar, click the **Undo** button.
14. Save the changes to the document, and leave the document open for the next Step-by-Step.

QUICK TIP

A file marked as final in a Microsoft Office 2013 program may not be read-only if someone opens it in an earlier version of the Microsoft Office program.

Preparing a Document for Printing

After the document is finalized, you can prepare a ***hard copy***—a printed copy—of the document to share the information. Often, multiple copies are prepared and distributed. Your system may have two or more printers available, including inkjet printers, laser printers, fax programs that also serve as a type of printer, and others. The benefit of having more than one printer to choose from is that different printers offer different features.

VOCABULARY
hard copy

Printing a Document

When you click the FILE tab and then click Print, the print settings are displayed in Backstage view. When you click the Print command at the top of the middle pane, the content in the active window or document is sent directly to the printer, and you will not have the opportunity to change the printing options or printer settings. The default printer options will be applied. If your computer accesses more than one printer, you will want to select the printer you want to use. You can specify the number of copies and the range of pages to print. You can also change the printer settings (such as print quality or the color settings using the Printer Properties link). The options will vary, but most of the print options are similar for all applications. In addition to the print settings, a preview of the print layout is displayed in a pane on the right. If the document has multiple pages, you can use the Previous Page and Next Page buttons to preview each page.

QUICK TIP

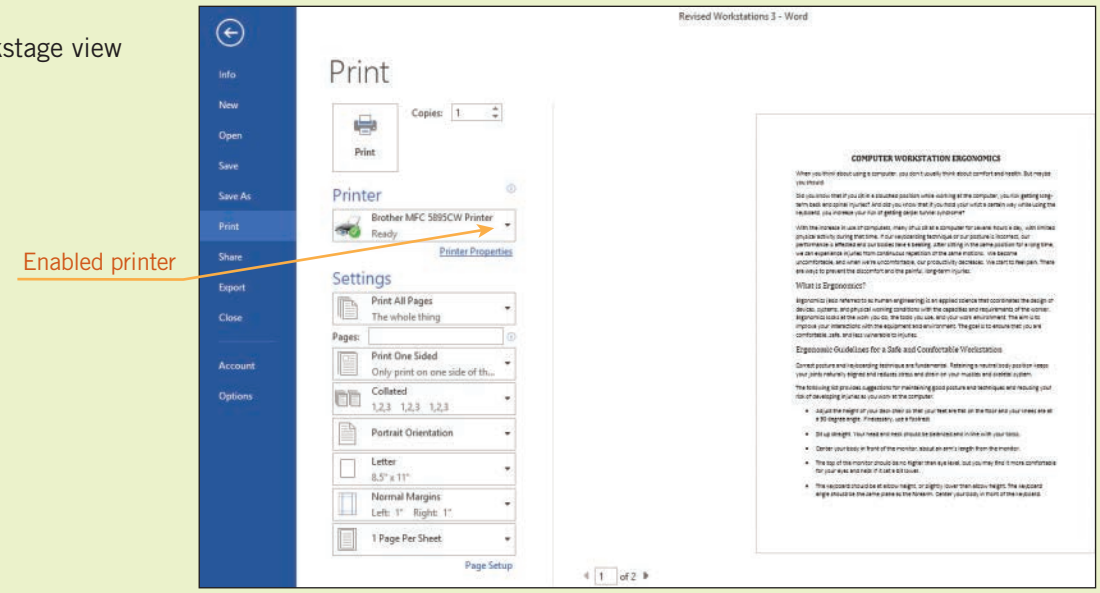
When you open a document attached to an e-mail, because of securities settings, you may need to enable editing before you can edit or print the document.

Step-by-Step 14.5

2-1.1.4

1. If necessary, open the **Revised Workstations 3** file from your solution files.
2. Click the **FILE** tab, and then click **Print** to show the Print settings in Backstage view as shown in **Figure 14–15**.

FIGURE 14–15
Print settings in Backstage view



Enabled printer

WARNING

Check with your instructor about the policy for printing documents in this course.

3. In the middle pane, under *Printer*, click the **enabled printer name**, as shown in Figure 14–15. If your computer is connected to more than one printer, the other printers will be displayed in this list. Click the **enabled printer name** to close the list without making any changes.
4. At the bottom of the Preview pane, click the **Next Page** button to show page 2. Then click the **Previous Page** button to show page 1.
5. At the top of the middle pane, change the **Copies** setting to **3**. This setting indicates that three copies will be printed.
6. In the middle pane, under *Settings*, note that the first setting is *Print All Pages*. Click in the **Pages** box. Type **2**. Note that the setting above now displays *Custom Print*. With these settings, you would print three copies of page 2.

QUICK TIP

To print a range of pages, use a hyphen to indicate the page range. For example: 2-8. To print multiple pages without printing a full range, use a comma. For example: 2,5,7.

7. Delete the number in the *Pages* box. The setting above changes and displays the default setting *Print All Pages*.
8. Under *Settings*, click **Print All Pages**. In the submenu, click **Print Current Page**. When this option is enabled, the page displayed in the Preview pane is the only page that will print.
9. To print, you would click the Print command at the top of the middle pane, but there is no reason to print this page of the document. Press **Esc** to exit Backstage view without printing.

10. Scroll down and select the entire bulleted list. Click **FILE** and then click **Print**. Under *Settings*, click the **Print Current Page**. In the submenu, click **Print Selection**. To print, you would click the Print command at the top of the middle pane, but there is no reason to print the bulleted list.
11. At the top of the middle pane, change the *Copies* setting to **1**. Under *Settings*, click **Print Selection**, and then click **Print All Pages**. The default settings are restored. Press **Esc** to exit Backstage view.
12. Deselect the text, and leave the document open for the next Step-by-Step. (If you close the document and are prompted to save changes to the document, click **Don't Save**.)

Customizing Print Settings and Properties and Showing the Print Queue

Many people use their default printer settings, and they are not aware of all the additional features and options that are available. Most printers have settings for adjusting the printing speed and the print quality. When working with multipage documents, special features such as reverse printing, collating, and duplex printing are very useful. ***Reverse printing*** reverses the order of the pages so the last page prints first. When enabled, the ***collating*** setting prints all of the pages in one copy of the document before printing the next copy so that the printed pages are automatically arranged in the proper order. ***Duplex printing*** is printing on both sides of the page. Of course, you can manually feed the paper back into the printer to print the back side of the page, but it is very convenient when the printer will do that automatically.

The ***print queue*** shows information about print jobs that are waiting to print. When you open the print queue, you can see the sequence of the active documents, the document owner, and the number of pages to print. In addition to viewing the status and information about the waiting print jobs, you can also use the print queue to pause, resume, restart, or cancel print jobs.

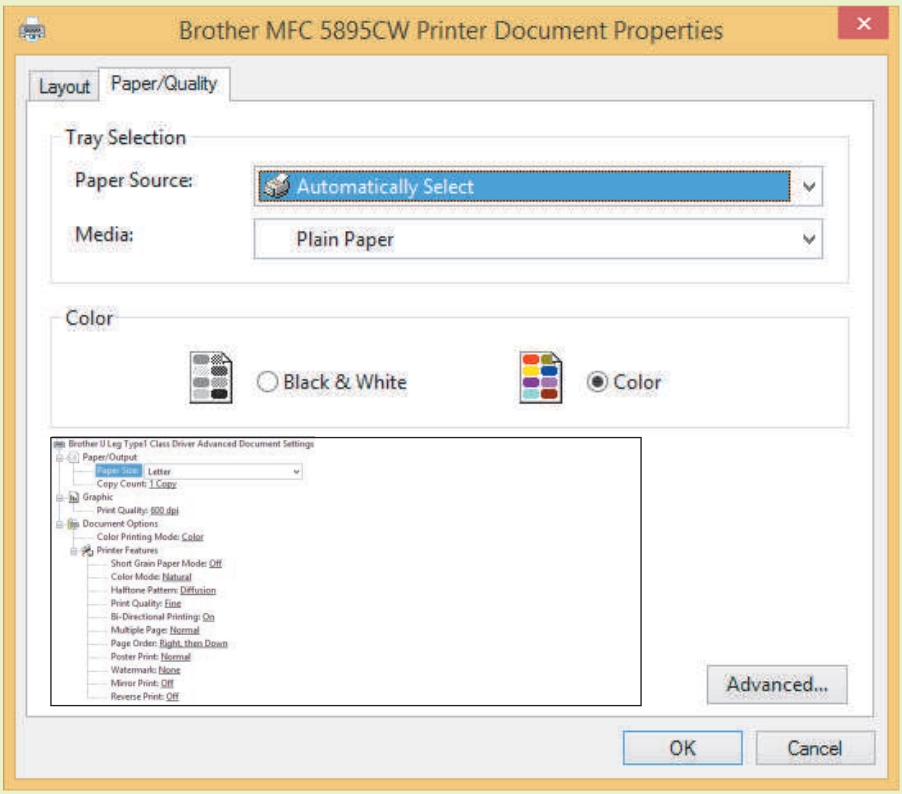
VOCABULARY
reverse printing
collating
duplex printing
print queue

Step-by-Step 14.6

2-1.1.4
2-1.1.7

1. If necessary, open the **Revised Workstations 3** file from your solution files.
2. Click the **FILE** tab, and then click **Print**. In the middle pane, under *Printer*, click the **Printer Properties** link to open the Printer Properties dialog box, similar to the one shown in **Figure 14–16**. Property settings will vary depending on the printer selected, but they will most likely include paper size, print quality, and color management.

FIGURE 14–16
Printer Properties dialog box



3. Explore the settings that are available on your printer. If multiple tabs are displayed in the Properties dialog box, view the settings available on each tab.
4. Click **Cancel** to close the Printer Properties dialog box without saving any changes. Do not print the document.
5. Click the **Start** button to show the Start screen, and then type **Control Panel** and press **Enter**. Click **Hardware and Sound**, and then click **Devices and Printers**.

6. Under *Printers*, names of more than one printer may be displayed. A green check mark next to a printer name identifies the default printer. Double-click the name of the default printer. If necessary, click **Display Print Queue** to display a printer dialog box showing the print queue, similar to the one shown in **Figure 14–17**.

QUICK TIP

You can also display the print queue by right-clicking the default printer name and then clicking See what's printing.

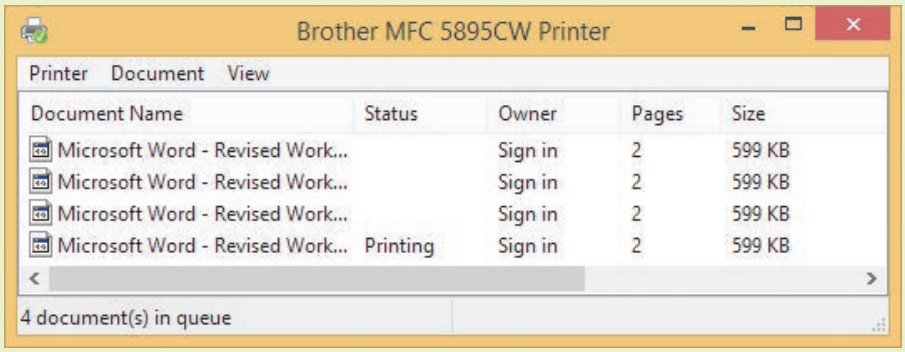


FIGURE 14–17
Print queue with documents waiting to print

7. When you open the print queue immediately after sending a document to the printer, the print queue may already be empty by the time you open it. However, if multiple documents are waiting to print, the print queue will look similar to the one shown in Figure 14–17, which shows multiple documents waiting to be printed.

8. To cancel a print job, you select the job(s) in the list you want to cancel. Because you have not sent a document to the printer, you do not have a document to select, but you can still look at the available commands. In the menu bar of the print queue dialog box, click **Document**. As shown in **Figure 14–18**, all the commands are dimmed, because a document is not selected. **Table 14–1** provides descriptions for each of the Document commands.

QUICK TIP

To quickly open the print queue during the print process, double-click the printer icon in the tray on the right side of the task bar.

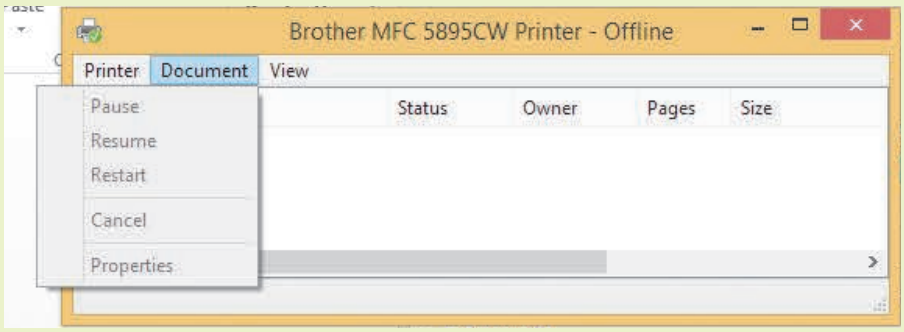


FIGURE 14–18
Document commands in print queue

TABLE 14–1 Document commands in print queue

OPTION	DESCRIPTION
Pause	Stops the document from being printed, but the document is not removed from the queue.
Resume	Continues the printing process when the selected document was paused.
Restart	Starts the printing process from the beginning for the selected document.
Cancel	Removes the document from the print queue. The current printer job may take a while to cancel, and it may finish printing without canceling, but the remaining jobs in the list will be canceled.
Properties	Shows general information about the document such as size, number of pages in the document, and the date and time the document was sent to the printer. A summary of the printer settings is also available.

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9. Close the print queue dialog box and any Control Panel windows.
10. Close the document. If prompted to save changes to the document, click **Don't Save**.

Printing Markup

When you print a document containing markup, you can choose to print the document with or without the markup.

Step-by-Step 14.7

IC3
2-1.1.4
2-1.1.7

1. Open the **Revised Workstations 2** file from your solution files.
2. Click the **FILE** tab, and then click **Print**. In the right pane, the print preview reveals that the revision marks and comments will also be printed. The document size is reduced so the balloons will also be printed on the same page.

3. In the middle pane, under *Settings*, click **Print All Pages** to show the list of options shown in **Figure 14–19**. Under *Document Info*, click **Print Markup**. The option is disabled, and the markup no longer appears in the print preview.

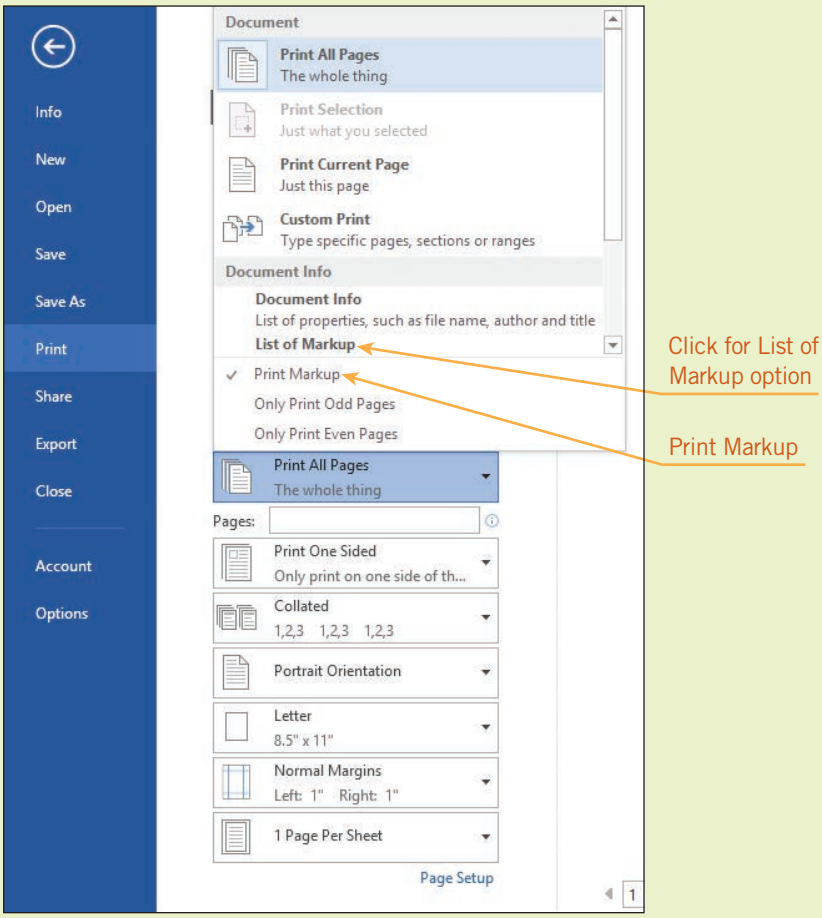


FIGURE 14–19
Print options

4. Click **Print All Pages** and then click **Print Markup** again to enable the option.
5. Click **Print All Pages**. Under *Document Info*, click **List of Markup**. This option prints a list of all changes, but the document is not printed. This printed list is very similar to the format shown in the Reviewing pane.

6. Under *Settings*, click **List of Markup**, and then click **Print All Pages** to return to the default settings.
7. Press **Esc** to exit Backstage view.
8. Click the **REVIEW** tab. In the Tracking group, click the **Display for Review** list arrow, and then click **No Markup**. Click the **FILE** tab, and then click **Print**. Note that the markup is not displayed in the Preview pane so the markup will not print if the document is sent to the printer. Press **Esc** to exit Backstage view.
9. If necessary, click the **REVIEW** tab. Click the **Display for Review** list arrow, and then click **All Markup**.
10. Leave the document open for the next Step-by-Step. (If you close the document and are prompted to save changes to the document, click **Don't Save**.)



ETHICS IN TECHNOLOGY

Maintain Integrity when Sharing Documents

Computer use is a privilege, and it imposes certain obligations and responsibilities. The behavior, courtesy, and etiquette expected in verbal and written communications is extended to electronic communications. When sharing documents, users must maintain integrity and discipline themselves to do what is right. It is important that shared documents are maintained in a manner that is accurate and honest.

Only view and edit the files you are authorized to access. Do not move, alter, or delete documents without permission. Respect the property of others. The use of the documents should be limited to the intended objectives, and release of information without permission is unethical. Passwords are used to restrict access, so do not share passwords with those who are not authorized to access the files. To protect confidential information, remove metadata, and follow the correct procedures to keep the information secure.

Troubleshooting Common Printing Problems



2-1.1.4

Even when you preview the pages in Backstage view, there are times when the print results do not meet expectations. This could be for a variety of reasons, as shown in **Table 14–2**.

TABLE 14–2 Troubleshooting printer problems

PROBLEM	CAUSE/SOLUTION
The entire document does not print, or some of the document looks blurry and faded.	If the colors do not print correctly, the printer may be low on, or out of ink or toner.
The document does not look the same as what you see on the screen.	Sometimes the font in your document might not be available on the printer you are using. Change the font in your document to a TrueType font, which looks the same on the printed page as it does on the screen, or change the font to one that is available on your printer.
The layout looks wrong.	You may be printing a document that was created with a different version of Word or was formatted for different printer settings, such as margins and paper size.
	Some printers will not print documents with margins less than 0.5".
	To have Word format the document to your printer's paper size for this printing session only, open the Print dialog box and then show the printer properties. Choose the appropriate paper size, and scale the document to fit the paper size.
Nothing happens.	Check the print queue. Your document may be blocked by one or more documents waiting to be printed.
	Make sure the printer is not out of paper.
	Make sure the printer is connected to the computer, the printer power is turned on, and the printer is online.
	Make sure the printer cable is connected to the right port.
	Check for paper jams.
	Open the Print dialog box and confirm that the correct printer is shown in the Printer name text box.
	Run the Windows Printing Troubleshooter. Click the Start button, and then click Help and Support. In the Search box, enter the keywords *printing troubleshooter*, and then select the problem(s) you are having and follow the instructions.
You do not get a printed document, and Microsoft Word itself stops responding.	It is likely that the printer driver is not installed or you do not have the correct printer driver. You can try installing an updated printer driver from the printer's manufacturer.

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Sharing Documents

The use of computers and telecommunications in the workplace has changed how we work. The majority of the information we work with is now generated by e-mail and electronic files. Instead of producing a hard copy of a document, it is now common practice to share a soft copy. A ***soft copy*** is a digital copy of data, such as a file viewed on a computer's display or shared via an e-mail attachment.

VOCABULARY
soft copy
metadata

Preparing Documents for Electronic Distribution

You may want to control what others can see in the document. For example, you may not want them to see the author of the document or the date the document was created. Information like this is referred to as ***metadata***—data that describes other data—and it is still easy to find. Much of this information is automatically updated, and you can remove or manually change some of the information.

Step-by-Step 14.8

IC3
2-1.1.3
2-1.3.6

1. If necessary, open the **Revised Workstations 2** file from your solution files. Save the Revised Workstations 2 document as **Revised Workstations 4**, followed by your initials.
2. Click the **FILE** tab. The document properties are displayed in the right pane as shown in **Figure 14–20**. The document properties include the file size, the number of pages and words, and so on. Note the information for the Author and Last Modified By properties on your screen.

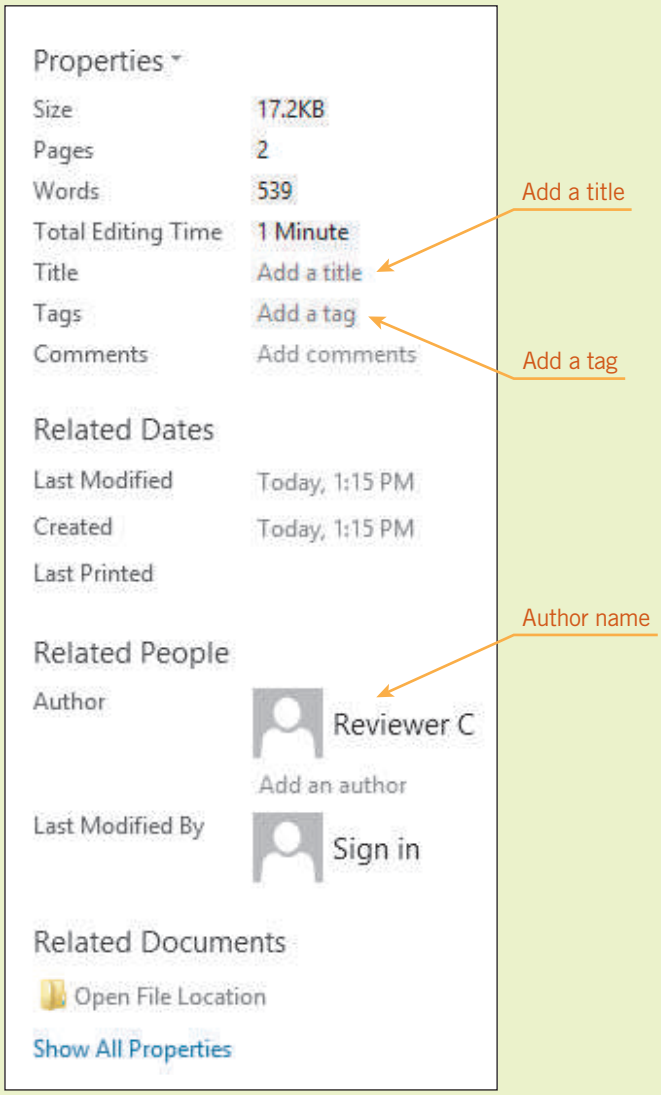
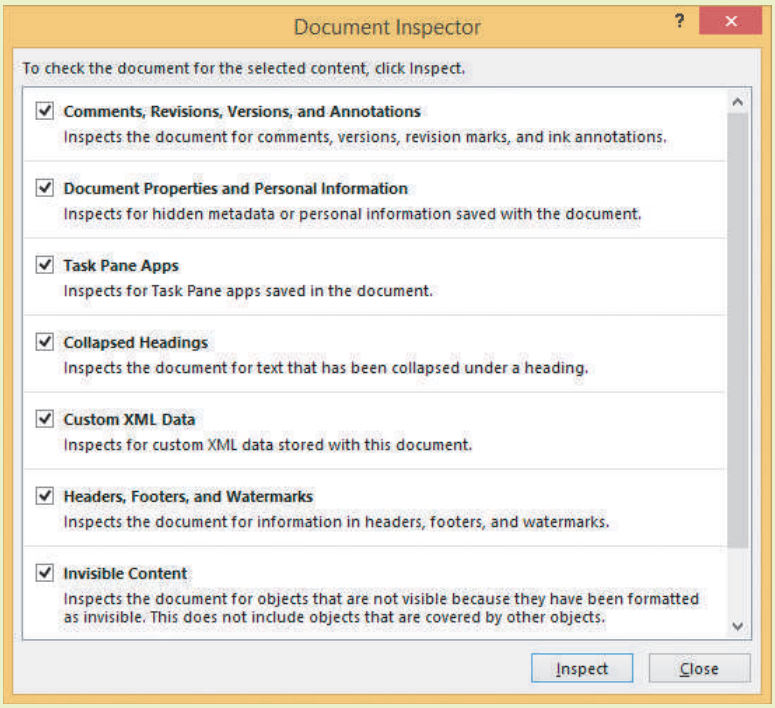


FIGURE 14–20
Document properties in Backstage view

3. In the Properties pane, click **539** (the Word count). You cannot select the word count. Word automatically calculates the total number of words, and you cannot change this property.
4. Click **Add a title**. Currently no title has been assigned, but a box is shown, so you can manually update this information. Type **Computer Workstation Ergonomics**.
5. Just below the Title box, click **Add a tag**. Type **safety, comfort, productivity**. These tags will be helpful when searching keywords in documents.
6. At the bottom of the Properties pane, click the **Show All Properties** link. More information about the document is displayed, including the template and boxes to enter information about the status, subject, and more.
7. If necessary, scroll down and then click the **Show Fewer Properties** link to hide some of the property information.

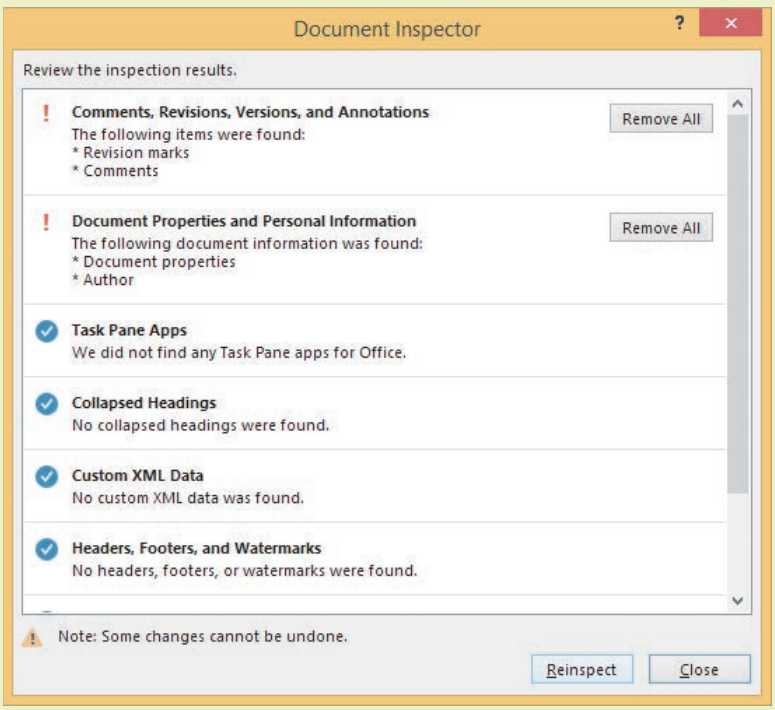
8. In the middle pane, click the **Check for Issues** button, then click **Inspect Document**. When prompted to save changes to the document, click **Yes**. The Document Inspector dialog box shown in **Figure 14–21** opens. Word proposes some features to check.

FIGURE 14–21
Document Inspector dialog box



9. At the bottom of the dialog box, click **Inspect**. The inspection results are displayed as shown **in Figure 14–22**.

FIGURE 14–22
Inspection results



10. You want to leave the revision marks in the document, so do not make any changes regarding the markup (*Comments, Revisions, Versions, Annotations*). However, you do want to remove the personal information, so next to *Document Properties and Personal Information*, click **Remove All**.
11. At the bottom of the Document Inspector dialog box click **Reinspect**. Then close the dialog box.
12. Click the **FILE** tab. In the Properties pane, notice that much of the property information has been removed, including the title, the tags, and the names of the author and user who last saved the document. Exit Backstage view.
13. Save the changes to the document. Notice that except for the moved text, all the markup is the same color throughout the document, and the user names in the comment balloons have changed to *Author*. Position the mouse pointer over a markup for a revision in the document. ScreenTips no longer display to provide the name of the reviewer and the date and time of the edits. Removing the personal information made the edits and comments anonymous.
14. Close the document.

Saving the Document in a PDF or XPS Format

When sharing documents with others, you need to consider that not all users will be using Word 2013. Before distributing the soft copy of a document, you may need to save it in a format that enables those working with different applications, platforms, and operating systems to access the file.

The ***Portable Document Format (PDF)***, created by Adobe Systems in 1993, is commonly used. To open files in the PDF format, Adobe Reader software must be installed on the computer. Microsoft first included the ***XML Paper Specification (XPS)*** format in the Office 2007 applications. To open files in XPS format, you must use Microsoft's XPS Viewer, which is installed by default in Office 2013 applications. Both PDF and XPS formats are designed to preserve the visual appearance and layout of each page, and they enable fast viewing and printing. These document formats are especially useful for resumes and newsletters because the appearance and printing of the document will be exactly as intended.

VOCABULARY
Portable Document Format (PDF)
XML Paper Specification (XPS)

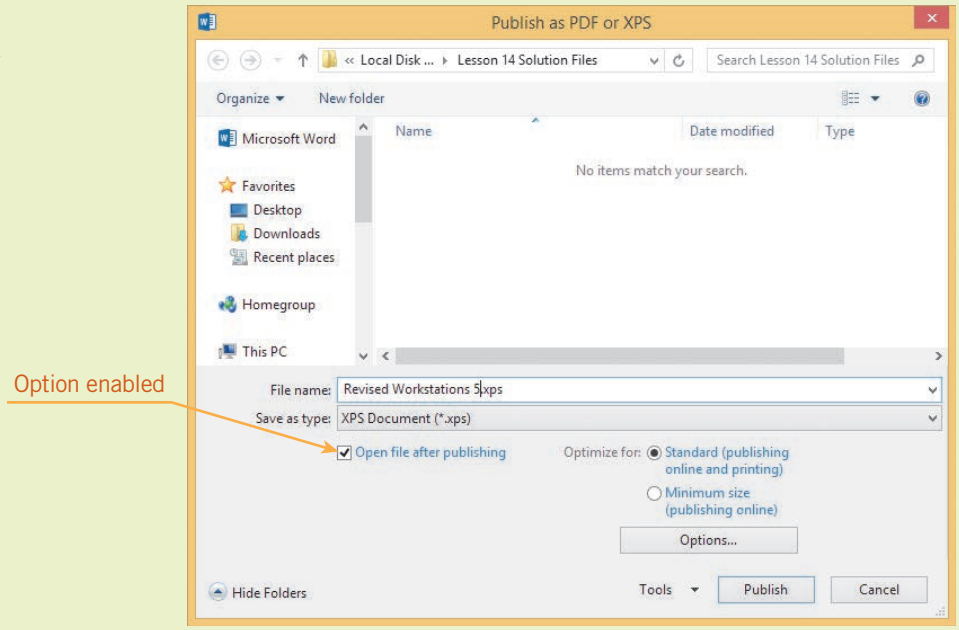
Step-by-Step 14.9

1. Open the **Revised Workstations 3** file from your solution files.
2. Click the **FILE** tab and then click **Export**. In the middle pane, *Create PDF/XPS Document* is already selected. In the right pane, click the **Create PDF/XPS** button. The Publish as PDF or XPS dialog box opens.

IC3
2-1.3.2
2-1.3.6

3. In the *File name* box type **Revised Workstations 5**, followed by your initials.
4. In the *Save as type* box, click the list arrow, and then click **XPS Document (*.xps)**. Make sure the *Open file after publishing* option is enabled as shown in **Figure 14–23**.

FIGURE 14–23
Publish as PDF or XPS dialog box



5. Click **Publish**. The document opens in an XPS Viewer app.
6. Drag across some text to select it. Press **Delete**. The read-only format does not allow any changes. Position the insertion point in the upper-left corner of the screen and then click the Word thumbnail to close the XPS Viewer window and return to the Word document window. The Revised Workstations 3.docx document remains open.
7. Click the **FILE** tab, and then **Export**. In the right pane, click the **Create PDF/XPS** button. In the *Save as type* box, click the list arrow and then click **PDF (*.pdf)**.
8. In the File name box type **Revised Workstations 6**, followed by your initials. Make sure the *Open file after publishing* option is enabled. Click **Publish**. If either Adobe Reader or Adobe Acrobat are installed on your computer, the document will open in one of those applications, as shown in **Figure 14–24**. If Adobe applications are not installed on your computer, the document will open in Windows Reader.

QUICK TIP

To close the XPS Viewer app, press Ctrl+F4, then click the Desktop tile to return to the Word document.

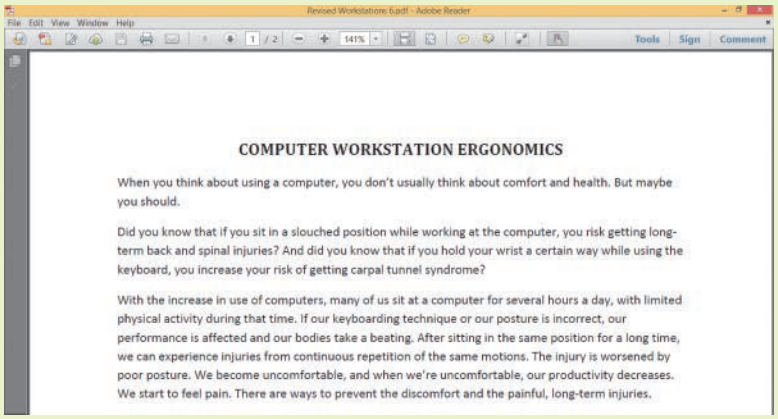


FIGURE 14–24
PDF document open in Adobe Reader

9. Do one of the following:
   a. To close the Adobe application, click the **Close** button in the upper-right corner of the Adobe window.
   b. To close the Windows Reader, press **CTRL+W**.
10. Close the Revised Workstations 3 document. Leave Word open for the next Step-by-Step.

Open and Edit a PDF Document in Word

To edit a PDF document you must have a specific type of software. However, you can open a PDF file in Word and edit the contents. When Word converts the PDF file content into a Word document, the results may not look exactly like the original PDF document, and some formatting may be lost during the process, especially if the PDF document contains graphics.

After editing the contents, you can re-save the file in PDF format. To save the document in PDF format, you can use the Export command as you did in the previous Step-by-Step, or you can change the file format in the Save As dialog box, as you will do in the following Step-by-Step.

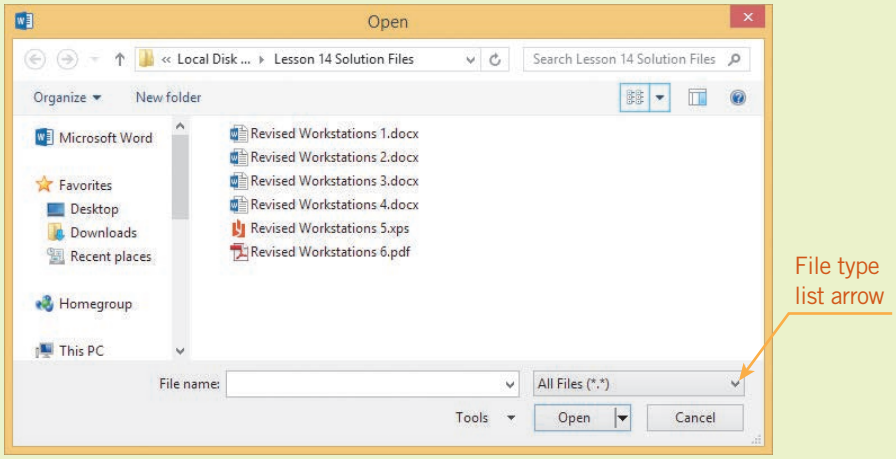
To complete this exercise, you must have Adobe Reader or Adobe Acrobat installed on your computer.

Step-by-Step 14.10

2-1.3.1
2-1.3.6

1. Click the **FILE** tab and then if necessary click **Open**. Navigate to the folder where you save your solution files. Click the **File type** list arrow in the box to the right of the *File name* box and then click **All Files (*.*)** as shown in **Figure 14–25**.

FIGURE 14–25
Open dialog box



2. Select the **Revised Workstations 6.pdf** file and then at the bottom of the dialog box click **Open**.
3. When prompted to convert the PDF document to a Word document, click **OK**. The content opens in a Word document window.
4. Note that in the third paragraph, the hyphen in the word "long-term" is missing. Insert a hyphen to make the necessary correction.
5. Select the entire bulleted list and then remove the space after the paragraphs.
6. Click the **FILE** tab and then click **Save As**. If necessary, navigate to the folder where you save your solution files. In the File name box, change the file name to **Revised Workstations 7**. Click the **Save as type** list arrow (see **Figure 14–26**), and then click **PDF (*.pdf)**. Then click **Save**.

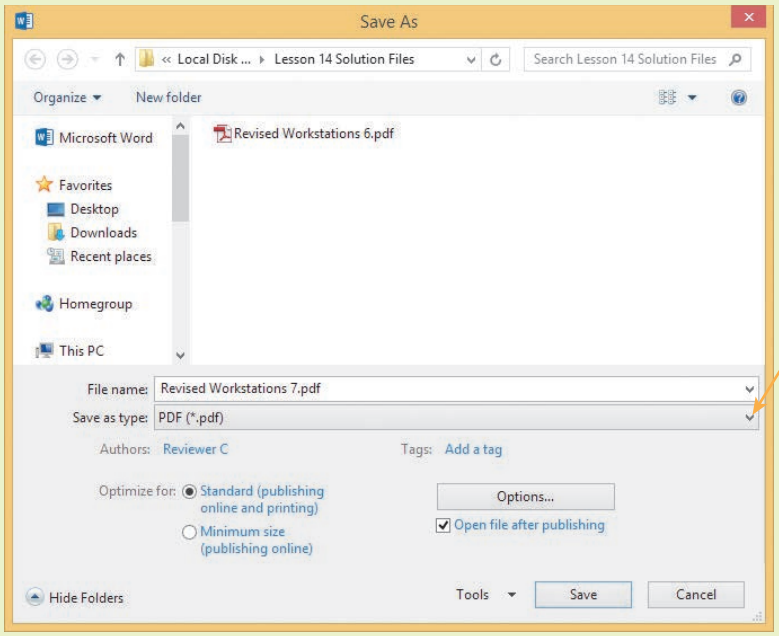


FIGURE 14–26
Save As dialog box

7. The document will open in an Adobe application window or in Windows Reader. Close the application window.
8. Close the Revised Workstations 6.pdf document. Do not save the changes.

Sharing and Publishing Documents

A convenient way to share a document is to upload the document to the ***Cloud***, a network where files are uploaded to a library on the Internet. Office 2013 makes it easy to upload documents to the Cloud using your Microsoft account to access a ***SkyDrive*** account, a free, online library space for storing and sharing files. You can use SkyDrive to store files such as documents, photos, music, videos, and notes. When you upload a file to the Cloud, you can choose whether or not to share the file with others. You can e-mail the file, create a link to the file in a text message, post the file on a social network or a Web page, or publish the file to a blog. If you're part of a group working on a document, group members can access the document at the same time. Then you and those with whom you choose to share the file can access the file from multiple devices, including your computer or table and phone, and edit and save changes to the document.

You can also share a document by attaching the document to an e-mail message. You can choose to save the attached document in either a PDF or an XPS file format. You can also send a link to the current document in an e-mail message. If you have a fax service provider, you can send the document as an Internet fax, without using a fax machine.

When signed into your Microsoft Account, you can share a document by presenting the document online. This new feature in Word enables you to upload the document to the Cloud and then create a link and invite others so they can join the presentation and review the document.

A ***blog*** (an abbreviated version of the term *Web log*) is a journal maintained by an individual or a group and posted on a Web site for public viewing and comment. Blogs are often referred to as online diaries, and they may include graphics, photos, music, video, and links to Web sites. A typical blog Web site provides links and

VOCABULARY

Cloud

SkyDrive

blog

ABOVE AND BEYOND

SkyDrive Pro is a service available to business users who subscribe to Office 365 and Windows SharePoint Online accounts. SkyDrive Pro provides tools for sharing and updating files and keeping colleagues informed about document status. Users can publish the document at the Web site and keep the local document on your computer synchronized with the changes and updates. The organization administrator controls the access to documents and the rights of users.

enables instant feedback, and many blog hosts offer free blog-posting services. You must have authorization to access and publish information on a blog Web site.

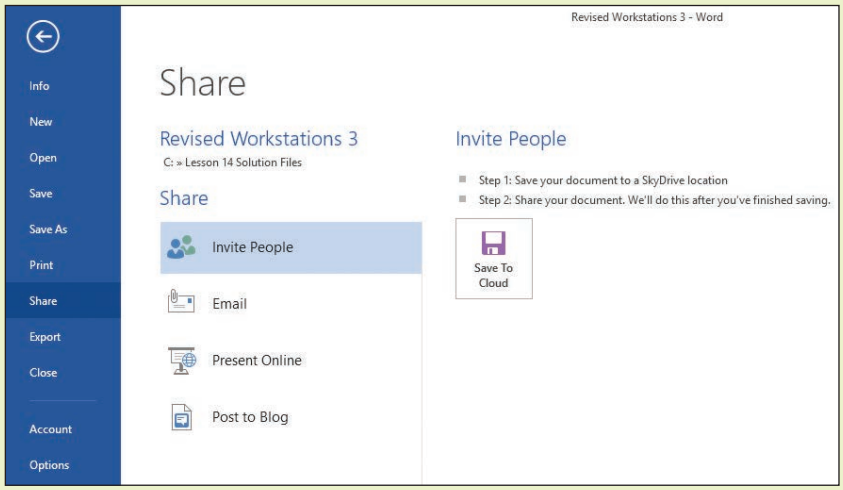
Of course, to use any of the above described features for sharing, you must be connected to a network or the Internet, and you must have sufficient bandwidth (the speed of data transfer) for transferring the electronic files.

Step-by-Step 14.11

IC3
2-6.2.1
2-6.2.2
2-6.2.3

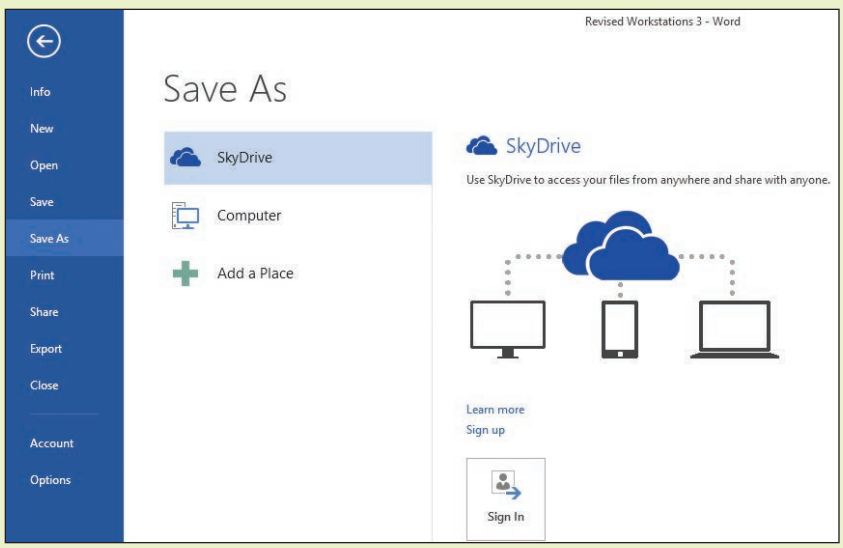
1. Open the **Revised Workstations 3** file from your solution files.
2. Click the **FILE** tab, and then click **Share**. Compare your screen to **Figure 14–27**. Your share options may differ. If necessary, in the middle pane, click **Invite People**.

FIGURE 14–27
Share using the Cloud



3. At this point you would click the Save To Cloud button. Do not click any buttons.
   a. If it is the first time you've uploaded a document to the Cloud, you would be prompted to sign into your Windows Live account as shown in **Figure 14–28**.

FIGURE 14–28
Sign in to the Cloud



b. Once you are signed in to SkyDrive, a Save As dialog box opens and you have access to folders in your personal library in the Cloud, similar to what is shown in **Figure 14–29**. You can then select the folder where you want to save the document and then click **Save**. The Save button on the Quick Access Toolbar will then show a Cloud refresh symbol, indicating that when the file is saved in the Cloud, the document will be updated with your edits. The refresh symbol also serves as a reminder that when you save changes you are saving the document in the Cloud.

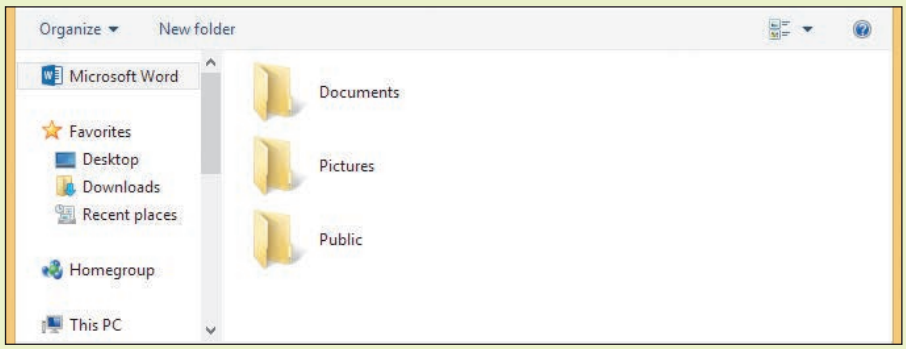


FIGURE 14–29
Personal library folders in the Cloud

4. In the Navigation pane, click **Share** and then click **Email**. Several options are displayed, as shown in **Figure 14–30**. Your options may differ from those shown in the figure.

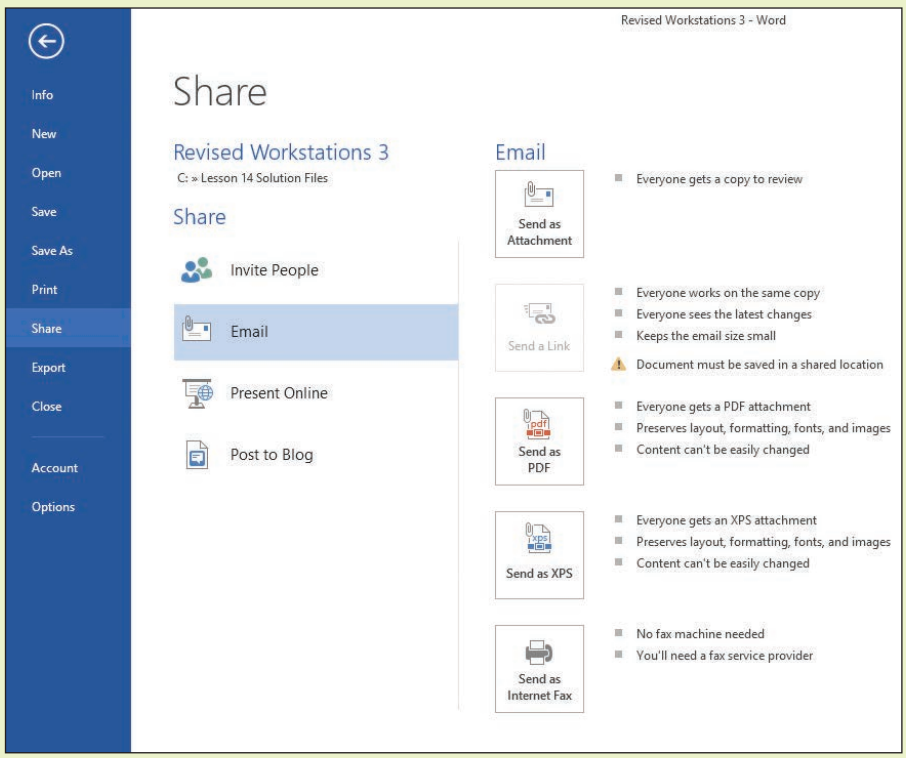


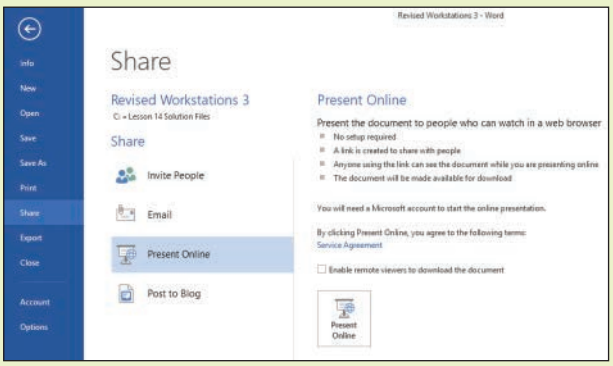
FIGURE 14–30
Share using Email

QUICK TIP

Be sure to check if a document is linked with other information sources, such as databases or spreadsheets, to avoid unintentionally sending or publishing information about the linked data.

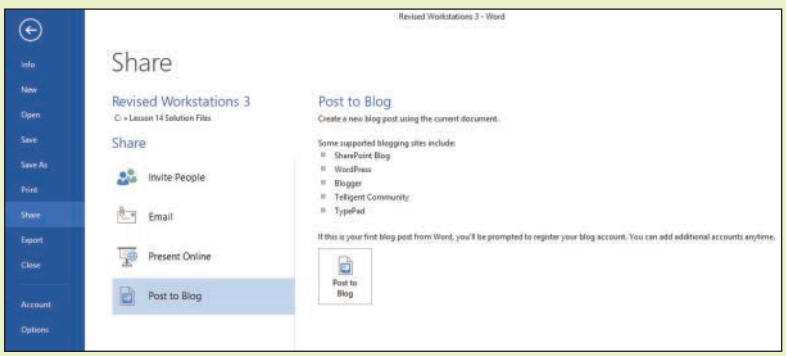
5. In the right pane, click the **Send as Attachment** button. If Microsoft Outlook is your default e-mail application, the Outlook application will open and a new message window opens. If Outlook is not your default e-mail application, most likely your e-mail application will open with a new message form. (If a prompt displays that the mail could not be sent, click **OK**.)
6. Note that in the message window the Revised Workstations 3 document is already attached to the e-mail message and the subject line displays the document filename. Close the message window without saving any changes.
7. Click the **FILE** tab, and then click **Share**. Click **Present Online**. The information in the right pane adapts, and information similar to what is shown in **Figure 14–31** is displayed. At this point you would click the Present Online button and sign in with your Windows Live account. Then you would be prompted to invite people to join the presentation.

FIGURE 14–31
Share using Present Online



8. In the left pane, click **Post to Blog**. In the right pane, the options shown in **Figure 14–32** are displayed. At this point you would click the Post to Blog button. If it is the first time you've posted a blog from Word, you would be prompted to register your blog account.

FIGURE 14–32
Share using Post to Blog



9. Exit Backstage view. Leave Revised Workstations 3 open for the next Step-by-Step. If you end your Word session and close the document, when prompted to save changes to the document, click **Don't Save**.

Protecting Documents

If a document contains important or confidential information, you need secure ways to share the information. Word offers features that enable you to control sensitive information and collaborate in confidence.

VOCABULARY
encryption
case sensitive

Restricting Access

The most secure option is to encrypt the document. ***Encryption*** is a standard method for encoding data. During the process of encryption, a password is assigned, and then all users must enter the password to open the document. If you want to permit some users to modify the encrypted document, you can create a second password that will allow them to edit and save changes to the document. This option limits those who can edit the document.

It is recommended that passwords include a combination of text, numbers, and symbols and be at least eight characters in length—the more characters the better. Passwords are ***case sensitive***, which means when entering a password, the upper- and lowercasing of the letters must be identical to the casing of the letters in the assigned password.

QUICK TIP

People often choose to use nicknames or commonly used words for their passwords, such as wildcats because they are easy to remember. To create a stronger password with a combination of text, numbers, and symbols, replace the vowels with numbers and/or symbols. For example: *W1ldc1ts!*.

Step-by-Step 14.12



IC3
2-6.2.1
2-6.2.2
2-6.2.3

1. If necessary, open the **Revised Workstations 3** file from your solution files. Save the Revised Workstations 3 file as **Revised Workstations 8**, followed by your initials.
2. Click the **FILE** tab. In the middle pane, click the **Protect Document** button, and then click **Encrypt with Password**. The Encrypt Document dialog box opens.
3. Type **#jcK554!** and click **OK**. Then when prompted, type the password **#jcK554!** again and click **OK**. The Protect Document button is now highlighted in the middle pane.
4. Exit Backstage view. Close the document. When prompted to save the changes, click **Save**. The encryption process is completed.
5. Reopen the **Revised Workstations 8** document, using the open password you created in Step 3. Users who do not know this password will not be able to open the document. Now that the document is open, you can edit the document.

WARNING

If you forget the password, the file cannot be reopened. When you assign a password to a document, write it down and keep the note in a secure place.

6. Click the **FILE** tab, and then click **Save As**. Navigate to the folder where your solution files are saved. At the bottom of the dialog box, click **Tools**, and then click **General Options** to open the General Options dialog box shown in **Figure 14–33**. Note that the password to open the file is already applied. You can choose to assign one or both passwords. The second password allows users to modify the document. If you choose to use both passwords, make sure the passwords are not the same.

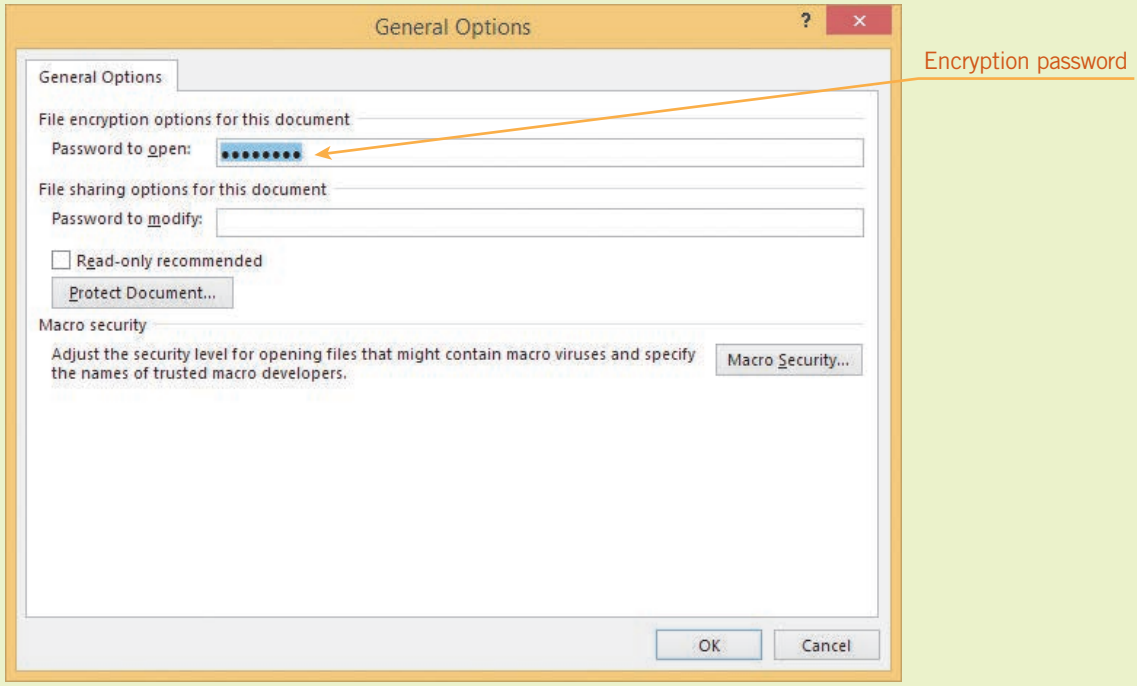


FIGURE 14–33
General Options dialog box

7. In the *Password to modify* box, type **AeM#1mxA**. Be sure all the letters have the correct casing. The encryption password allows users to open the document. By assigning a second password, users will not be able to modify the document without entering the second password. Click **OK**. When prompted, type the password **AeM#1mxA** and click **OK**.
8. In the *File name* box, the filename *Revised Workstations 8* is still displayed. Click **Save**, and close the document.
9. Reopen the **Revised Workstations 8** file. When prompted, type the password **#jcK554!** and click **OK**.
10. A second prompt appears indicating that a password must be entered to modify the document. (Users who do not know this password can click Read Only to view the document.) Type the second password **AeM#1mxA**, and click **OK** to open the document with permission to modify the content.

11. To remove the encryption, click the **FILE** tab, click the **Protect Document** button, and then click **Encrypt with Password**. In the Encrypt Document dialog box, delete all the characters for the current password, and then click **OK**.
12. Exit Backstage view. Close the document. When prompted to save the changes, click **Save**. Then reopen the document. The Password dialog box opens. Even though the document is no longer encrypted, users must still enter a password to modify the document. To remove this password, you would need to open the General Options dialog box and then delete the password characters.
13. In the Password dialog box, click **Read Only**. Press **Esc** to switch to Print Layout view. Select the **document title**, and change the font color to red. On the Quick Access Toolbar, click the **Save** button. The Save As dialog box opens. Click **Save**. A prompt appears indicating that the document is read-only. To save the changes to the document you would need to create a new filename.
14. Click **OK** to close the prompt. Click **Cancel** to close the Save As dialog box, and then close the document without saving the changes.

Restricting Formatting and Edits

Even when you choose to allow others to make revisions and add comments, you can still be selective about who is allowed to make edits as well as the types of edits they can make. After setting the restrictions, you must assign a password to enforce the restrictions.

Step-by-Step 14.13

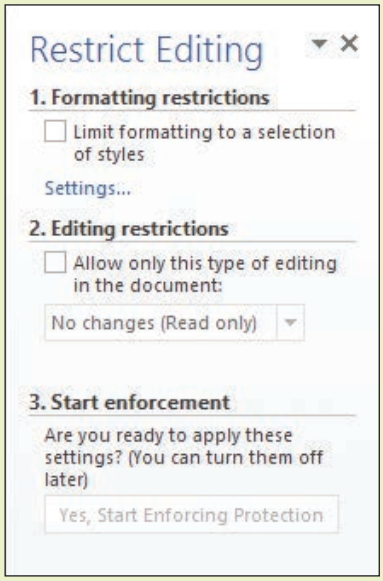


1. Open the **Revised Workstations 3** file from your solution files. Save the Revised Workstations 3 file as **Revised Workstations 9**, followed by your initials.

IC3
2-6.1.1
2-6.1.2
2-6.1.3

2. Click the **REVIEW** tab. In the Protect group at the far right side of the REVIEW tab, click the **Restrict Editing** button. The Restrict Editing task pane shown in **Figure 14–34** appears.

FIGURE 14–34
Restrict Editing task pane

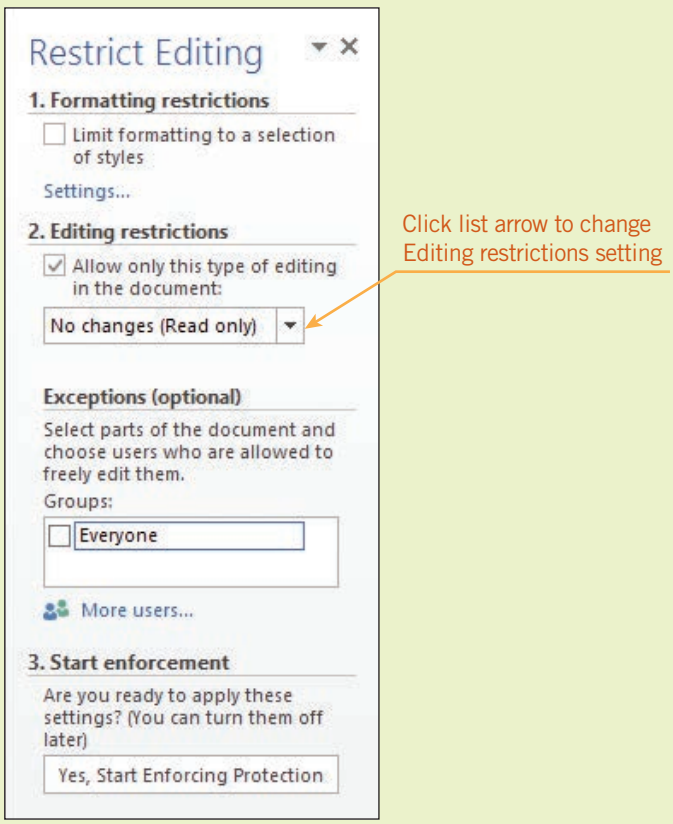


ABOVE AND BEYOND

The Block Authors command (in the Protect group on the REVIEW tab) is available only when a document is saved to a Microsoft SharePoint server.

3. Under *2. Editing restrictions*, click **Allow only this type of editing in the document** to enable the option. A check mark appears in the check box when the option is enabled. As shown in **Figure 14–35**, under *Exceptions (optional)*, new options are now displayed, and the current Editing restrictions setting is *No changes (Read only)*.

FIGURE 14–35
New Exceptions options in the Restrict Editing task pane



4. Under *Editing restrictions*, click the list arrow, and then click **Tracked changes**. Notice that the options in the task pane change again. When the Tracked changes option is enabled, reviewers can make revisions and also add comments to the document.
5. Click the **Editing restrictions** list arrow, and then click **Comments**. New Exceptions options are displayed again. With the Comments option enabled, you can make exceptions and allow specified reviewers to edit all or part of the document.
6. Click the **Editing restrictions** list arrow again, and then click **Filling in forms**. This option allows users to enter information in form fields such as text boxes, check boxes, and lists. When this option is enabled, the exceptions are not available, and users cannot track changes or add comments.
7. Click the **Editing restrictions** list arrow, and then click **No changes (Read only)**.
8. Select the first four paragraphs in the document (all the text above the heading *What is Ergonomics?*). Then in the task pane, under *Exceptions (optional)* click **Everyone** to enable the option. Deselect the text. Anyone with access to the document can edit the highlighted paragraphs.
9. Click in the highlighted text. Note that the Everyone check box is enabled. Then click anywhere in the text that is not highlighted. Notice that the check mark is no longer displayed next to the Everyone option. With this setting, no users would be permitted to edit this part of the document.
10. Scroll down and select all the content in the bulleted list. In the task pane, click the **Everyone** option. Deselect the text. Users can edit two regions in the document.
11. In the task pane, under *3. Start enforcement*, click **Yes, Start Enforcing Protection**. In the Start Enforcing Protection dialog box, type the password **89*A*88*87** in the first box. Click in the **second password** box, reenter the password, and then click **OK**.
12. Select the heading **What is Ergonomics?**. Note that the Mini toolbar is not displayed. You cannot edit this portion of the document. Try deleting or replacing the text. Formatting and editing is restricted in this portion of the document.
13. At the bottom of the task pane, click the **Stop Protection** button. The Unprotect document dialog box opens. To remove the restrictions you must enter a password. Click **Cancel** to close the Password dialog box without making any changes. In the upper-right corner of the Restrict Editing task pane, click the **Close** button.
14. Save the changes and close the document.



SUMMARY

In this lesson, you learned:

- Tracking changes with revision marks makes it easy to identify who made the changes and when the changes were made.
- You can choose the markup that you want to appear on the screen and when the document is printed.
- Revisions can be accepted or rejected, and comments can be marked as done or easily removed from the document.
- Printers provide a variety of settings and options for managing print jobs.
- You can view, pause, and cancel print jobs.
- There are numerous issues to consider when troubleshooting printing problems.
- When preparing documents for electronic distribution, you must choose an appropriate format and you may want to remove metadata.
- Word provides several options for sharing documents.
- You can protect documents by restricting access and by restricting formatting and editing.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. When restricting formatting changes, the setting can apply to a specified portion of the document.

T F 2. Tracked changes and comments can be viewed in a balloon or in the Reviewing Pane.

T F 3. You can have a maximum of eight reviewers for a document.

T F 4. When tracking changes, you must open the Reviewing Pane to view the format changes.

T F 5. You can choose to hide the tracked changes and show only the comments added to the document.

MULTIPLE CHOICE

Select the best response for the following statements.

1. Duplex printing is _____.
   A. when your computer has access to two printers on the system
   B. when you apply two or more printing options
   C. a special printer feature for automatically printing content on both sides of the page
   D. a special printer feature for automatically printing two copies of each page in the document
2. Once you store a document in the Cloud, you can _____.
   A. e-mail the file
   B. create a link to the file in a text message
   C. post the file on a social network or a Web page
   D. all of the above
3. When a document is marked as final, _____.
   A. the user must enter a password to make any changes to the document
   B. all personal information is removed from the document
   C. those who review the document will know they are viewing the final version
   D. no more changes can ever be made to the document

4. When you open the printer queue, you can _____ print jobs.
   A. pause or resume
   B. restart
   C. cancel
   D. all of the above
5. When a document is encrypted, _____.
   A. the user must enter a password to open the document
   B. the user can view the document but cannot make any changes to the document
   C. the document will open in most applications, operating systems, and platforms
   D. all personal information is removed from the document

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. _____ is invisible data in a document that describes other data.
2. A(n) _____ is a digital copy of a document.
3. _____ is a personal library Microsoft Office provides for storing and sharing files.
4. A(n) _____ is an annotation that the author or a reviewer adds to the document.
5. The revision marks and annotations that appear in a document are referred to as _____.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What are the advantages of using the Comment feature?

2. Describe how you can customize the settings for tracked changes, such as the colors for inserted and deleted text.

3. What is the recommended combination of characters for a password?

4. Describe how to format comments so that they appear in a balloon in the margin.

5. If you want others to view the document exactly as it appears on your screen, what format should you use when you save the document? Explain why.

PROJECTS

PROJECT 14–1

IC3
2-1.1.7
2-1.3.6
2-6.1.1
2-6.1.2
2-6.1.3

1. Open the **Facilities** file from the drive and folder where your Data Files folder is stored. Save the Facilities document as **Revised Facilities 1**, followed by your initials.
2. Make note of the current user name and initials, and then change the user name to **Facility Manager**, and change the user initials to **FM**.
3. Toggle on the **Track Changes** feature.
4. Add the following three items in the bulleted list, in the correct alphabetical order: **pilates classes**, **strength and conditioning**, and **yoga classes**.
5. Select **pilates** and insert the comment **Should this be initial caps?**.
6. Select the whole sentence at the end of the paragraph beginning *The goal of a rehab facility*…. Move the sentence to the end of the paragraph directly above.
7. At the end of the sentence you just moved, insert the new text **both young and old**.
8. Find all occurrences of *rehab* and replace them with **rehabilitation**.
9. Find all occurrences of *clinics* and replace them with **facilities**.
10. Toggle off the Track Changes feature, and then save the changes to the document.
11. Save the document as **Revised Facilities 2**, followed by your initials.
12. Inspect the document and remove the personal information. Do not remove the revision marks and comments. Check the document properties to make sure all the personal information was removed.
13. Save the changes and close the document, but leave Word open.
14. Restore the user name and initials to what they were before you changed them in Step 2.

PROJECT 14–2

IC3
2-1.1.7
2-1.3.6
2-6.1.1
2-6.1.2

1. Open the **Furniture** file from the drive and folder where your Data Files folder is stored. Save the Furniture document as **Revised Furniture 1**, followed by your initials.
2. Hide the comments in the document.
3. Move to the first revision and reject the change.
4. Move to the second revision and accept the change.
5. Show all revisions inline.
6. Accept all changes in the document.
7. Restore the default settings for showing markup. Change the Show Markup setting so only comments and formatting are displayed in balloons and also enable the option to show comments.
8. Delete all the comments in the document.
9. Save the changes to the document.
10. Toggle off the Track Changes feature.
11. Save the document in the PDF format using the new filename **Revised Furniture 2**, followed by your initials. The document will open in Adobe Reader or Adobe Acrobat if the application is installed on your computer.
12. Close the Adobe Reader window. Close the Revised Furniture 1 document.

PROJECT 14–3

2-6.2.1
2-6.2.2
2-6.2.3

1. Open the **Walking** file from the drive and folder where your Data Files folder is stored. Save the Walking document as **Revised Walking**, followed by your initials.
2. Protect the document by setting editing restrictions for No changes (Read only). Make exceptions for **Everyone** to edit the last two paragraphs in the document.
3. Enforce the protection by assigning the password **Max@69MHS!**.
4. Close the Restrict Editing task pane.
5. Save the changes to the document, and then close the document.
6. Reopen the document and make sure the restrictions are applied as intended. Delete the last paragraph.
7. Save the changes and close the document.

TEAMWORK PROJECT

The document you worked with in Project 14–3 provided information about exercising in both hot and cold weather. Many people have preferences for warm or cool weather for a variety of reasons. Team up with a partner to explore these reasons.

1. With your partner, decide who will take the warm weather topic and who will take the cool weather topic. If both of you prefer the same season, flip a coin to make the decision.
2. Create a new Word document, and save the document as **TP 14–1**, followed by your initials.
3. List the advantages and disadvantages of your chosen climate. If you live in a climate that is more or less warm all year round, use your imagination to list the advantages and disadvantages of cold weather.

PROJECT 14–4

2-1.1.4
2-6.1.3
2-6.2.1
2-6.2.2
2-6.2.3

1. Open the **Safety** file from the drive and folder where your Data Files folder is stored. Save the Safety document as **Revised Safety**, followed by your initials.
2. Preview the document for printing in Backstage view.
3. Show the document properties in Backstage view. Add the title **Work Place Safety**. Add the comment **industrial ergonomic assessment**.
4. To secure the document and limit access, encrypt the document with the password **BLT9vj5***. To allow options for users to modify the document, create the second password **b5PT51#**. Save the changes, and close the document.
5. Reopen the document using the encryption password. Then enter the password for modifying the document.
6. Type your first and last name at the end of the document.
7. Save the changes, and close the document.

2-6.1.1
2-6.1.2
2-6.1.3

4. Save the changes to the document.
5. Exchange documents and review your partner's list. Track changes and edit the document to include your opinions. Add comments where appropriate.
6. Review the changes and comments your partner added to your document. Accept or reject each revision, and delete the comments. Make any other edits to make your argument stronger.
7. After finalizing your documents, save the changes and share them with each other again and discuss with your partner whose arguments are more persuasive.

CRITICAL THINKING

CRITICAL THINKING 14–1

2-1.1.4

If the colors fade or are inconsistent when you print a page, it is possible that the printer is low on ink or toner. The cartridges are an additional expense, however, so you do not want to replace them until they are empty. So, how do you know the amount of ink or toner available in the cartridge(s)? Printers vary, and there is no universal answer for this question.

1. Explore the properties (or preferences) for the printer connected to your computer to locate the estimated levels of ink or toner for your printer.
2. Create a new Word document, and save the document as **CT 14–1**, followed by your initials.
3. List the steps that describe how you can check the level of ink or toner for your printer.
4. Save the changes, and then close the document.

CRITICAL THINKING 14–2

2-1.1.4

Further explore the properties for a printer connected to your computer. Identify one of the special features that interests you the most, such as printing posters, adjusting the volume of ink for faster drying time, or printing in grayscale.

1. Examine the feature and options, and use the Help screens to aid you in learning the purpose of the feature.
2. Create a new Word document, and save the document as **CT 14–2**, followed by your initials.
3. Write a short description about the feature, and explain when you would use this feature.
4. Save the changes to the document, and then close the document.

ONLINE DISCOVERY

For several months you have been researching your ancestry, and you would like to share your research data with family members. You plan to e-mail your summary document to all your family members, including grandparents and cousins. Before you send the document you decide to save it in the PDF format for platform neutrality. However, to open the file, the recipients must have either Word 2013 or Adobe Reader installed on their computer.

2-1.3.6

1. Search the Internet for the Adobe Web site and navigate to the Web page where you can find information about downloading the Adobe Reader application.
2. Create a new Word document, and save the document as **OD 14–1**, followed by your initials.
3. Copy the URL into the document. Include the current date.
4. Save the changes to the document, and then close the document.

JOB SKILLS

You share a printer in your work environment and you sent a document to the printer, but the document never printed. You check the print queue and you see that a document ahead of yours has been paused, which is why your document has not printed. You recognize the name of the owner of the document. You're in a hurry to get the hard copy of the document. What would you do?

2-1.1.4

1. Create a new Word document, and save the document as **JS 14–1**, followed by your initials.
2. Write a brief paragraph explaining how you would handle this issue.
3. Save the changes to the document, and then close the document.

EXPLORE AND SOLVE

On the right side of the REVIEW tab, Windows 8 users may see the Ink group that displays the Start Inking button  . Explore the purpose and benefits of this feature.

1. Create a new Word document, and save the document as **ES 14–1**, followed by your initials.
2. Write a brief paragraph explaining the purpose and benefits of the Inking feature. Use the feature in the document to provide an example of its results.
3. Save the changes to the document, and then close the document.

2-1.1.8
2-6.1.1
2-6.1.2
2-6.1.3



Estimated Time:
1.5 hours

LESSON 15

Working with Tables

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Create a table and insert text.
- Insert and delete rows and columns.
- Adjust column width and row height.
- Use the Draw Table and Eraser tools to create and edit a table grid.
- Format text alignment and direction within a table cell.
- Format borders and shading and apply table styles.
- Sort data in a table.
- Convert text to a table and vice versa.

WORDS TO KNOW

ascending order
banded rows
banded columns
cell
descending order
gridlines
header row
merging cells
Quick Tables
splitting cells

DATA FILES

To complete this lesson, you will need these data files:

BB Scores.docx
Demographics.docx
Historical Hurricanes.docx
Season Scores.docx

Microsoft product screenshots used with permission from Microsoft Corporation.

Suppose you have a document in Word that includes information you want to arrange in several lines across two or three columns. You create the columns you need in Word by setting tab stops. However, there is an easier and faster way. The table features in Word make the task of arranging text and numbers in columns both quick and easy. Borders and shading also help to organize information in a meaningful way.

Creating a Table

VOCABULARY
cell
header row

A table consists of cells that you add content to, such as text, numbers, or graphics. A ***cell*** represents one intersection of a row and a column in a table. In a table, rows go across and columns go down. It is common to add headings at the top of columns to label the content in the columns. The first row in a table or data source with the column headings is referred to as the ***header row***.

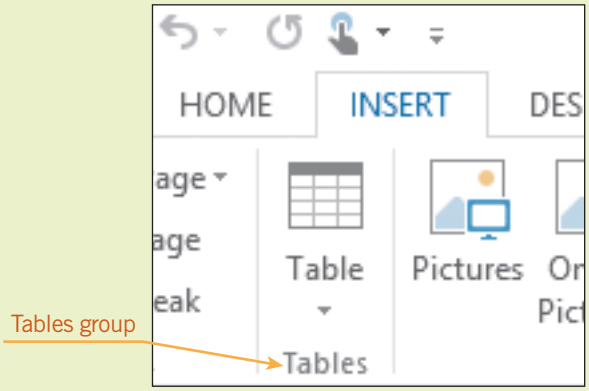
To create a table, you must first decide how many columns and rows you want in the table. You then create a table grid and enter the data in the cells. To move the insertion point from one cell to another, you can press the Tab key or the arrow keys. When you reach the end of a row and press Tab, the insertion point moves to the first cell in the next row.

Step-by-Step 15.1

IC3
2-1.1.9
2-2.1.1

1. Open Word and create a new blank document. Save the document as **Calories 1**, followed by your initials. If necessary, turn off the display of nonprinting characters.
2. Click the **INSERT** tab. In the Tables group shown in **Figure 15–1**, click the **Table** button. A grid of table cells is displayed.

FIGURE 15–1
Tables group on the INSERT tab



QUICK TIP

You can also create a table by clicking the Table button and then clicking Insert Table to open the dialog box. Then in the Insert Table dialog box, enter the number of rows and columns.

3. Drag the mouse pointer down the grid until seven rows of cells are highlighted, then continue to drag the mouse pointer across the grid to select three columns. The top of the grid displays *3×7 Table* and the table's Live Preview is displayed in the document window, as shown in **Figure 15–2**, as three columns by seven rows.

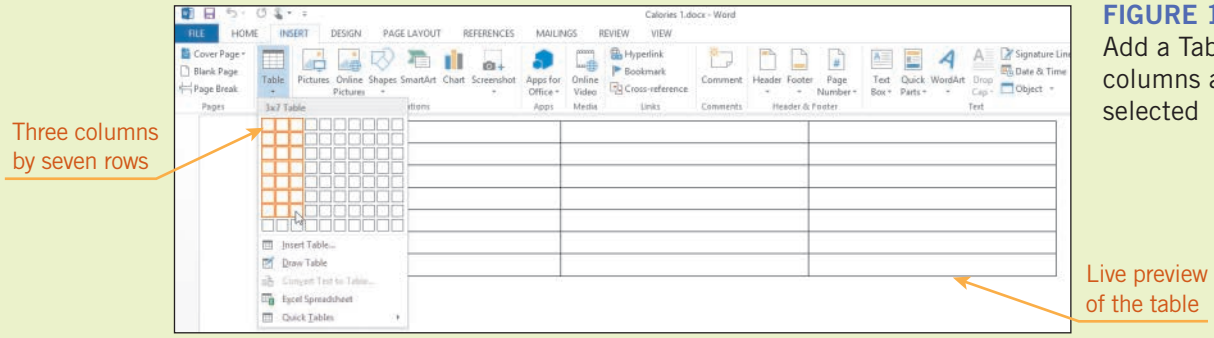


FIGURE 15–2
Add a Table grid with columns and rows selected

4. With the mouse pointer still positioned over the last selected cell, click. A new table is inserted in the document.
5. Because the insertion point is now positioned in a table in the document, the Ribbon adapts to show the TABLE TOOLS tabs for formatting and editing tables. Compare your screen with **Figure 15–3**. There are two TABLE TOOLS tabs: the DESIGN tab and the LAYOUT tab.

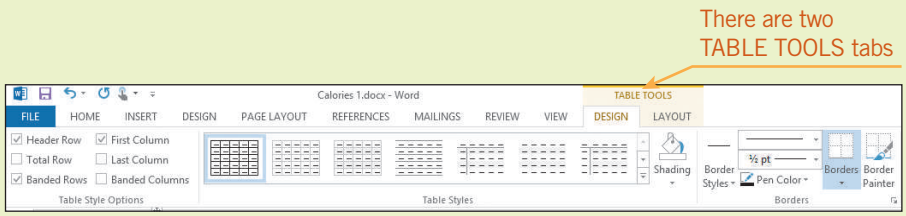


FIGURE 15–3
TABLE TOOLS DESIGN tab

6. The insertion point should be positioned in the first cell of the table. Press the **Tab** key to move the insertion point to the next cell to the right in the same row. Type **20 Minutes**. Press **Tab**, and then type **40 Minutes**.
7. Press **Tab** to move the insertion point to the first cell in the next row.
8. Press the **down arrow** to move the insertion point down to the third row.
9. Enter the remaining data shown in **Figure 15–4**. Use the Tab key or the arrow keys to move from one cell to another.

	20 Minutes	40 Minutes
Weight lifting	72	144
Golf: walking	132	264
Downhill skiing	144	288
Cross-country skiing	192	384
Mountain biking	204	408

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FIGURE 15–4
Table content for Step 9

10. Save the changes to the document and leave the document open for the next Step-by-Step.

Modifying the Table Structure

After you create a table, you may decide to change it. For example, you may need to add more rows or delete a column. Word has many features that make these changes easy.

Inserting Rows and Columns

To insert a new row at the end of the table, you can position the insertion point in the last table cell and press Tab. To insert a new row anywhere else in the table, or to insert new columns, you can use the Insert commands on the TABLE TOOLS LAYOUT tab.

Step-by-Step 15.2

IC3
2-1.1.9
2-2.1.1

1. If necessary, open the **Calories 1** file from your solution files. Save the Calories 1 document as **Calories 2**, followed by your initials.
2. If necessary, position the insertion point in the last cell in the lower-right corner of the table *(408)*. Press **Tab** to create a new row at the bottom of the table. Then type the following information in the new row:

   Road biking: 12–14 mph 188 376
3. Position the insertion point anywhere in the fourth row *(Golf: walking)*. Click the **TABLE TOOLS LAYOUT** tab for more table tools, as shown in **Figure 15–5**.

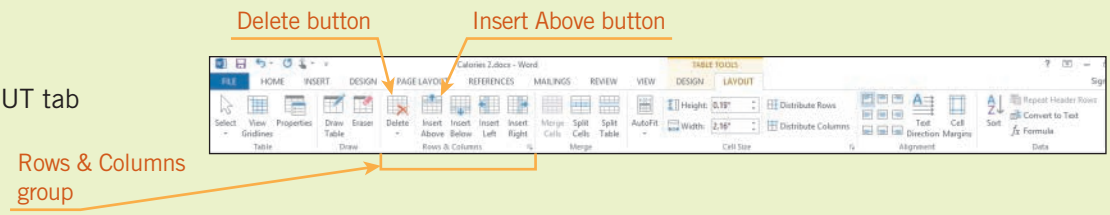
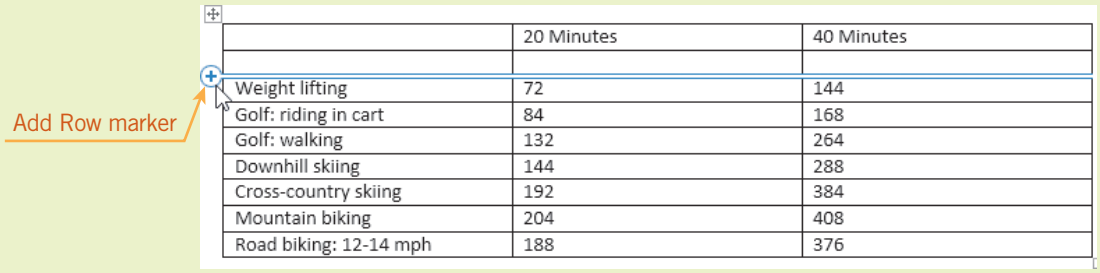


FIGURE 15–5
TABLE TOOLS LAYOUT tab

4. In the Rows & Columns group, click the **Insert Above** button. A new row is inserted above the row where the insertion point is positioned, and the table now has nine rows.
5. Click in the first cell in the new row to position the insertion point in that cell. Type the following information in the new row:

   Golf: riding in cart 84 168
6. Position the mouse pointer over the left border of the first cell in the third row. The Add Row marker displays at the top of the row as shown in **Figure 15–6**. Make sure the Add Row marker is above the *Weight lifting* row. Click the **Add Row** button. A new row is inserted above the *Weight lifting* row.



	20 Minutes	40 Minutes
Weight lifting	72	144
Golf: riding in cart	84	168
Golf: walking	132	264
Downhill skiing	144	288
Cross-country skiing	192	384
Mountain biking	204	408
Road biking: 12-14 mph	188	376

FIGURE 15–6
Add Row marker

7. In the first cell of the fifth row, position the insertion point in front of the word *Golf*. Then click and drag across all the cells in the fifth and sixth rows *(Golf: riding in cart* and *Golf: walking)* to select all the cells in the two rows. The gray shading indicates that the column cells are selected. In the Rows & Columns group, click the **Insert Below** button . Because you selected all the cells in two rows, two new rows are inserted below the selection.

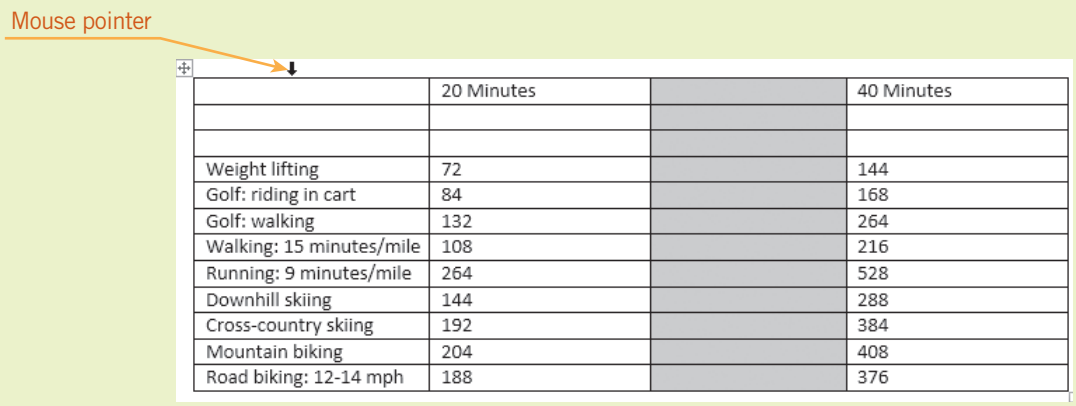
8. Position the insertion point in the first cell of the seventh row, the first new row under *Golf: walking*. Type the following information in the seventh and eight rows:

   Walking: 15 minutes/mile 108 216

   Running: 9 minutes/mile 264 528

9. If necessary, move the insertion point to any cell in the third column *(40 Minutes)*. In the Rows & Columns group, click the **Insert Left** button . A new column is inserted on the left side of the column where the insertion point is positioned.

10. Position the mouse pointer above the first row in the first column. When the mouse pointer changes to a down-pointing arrow as shown in **Figure 15–7**, click to select the column. Then click and drag the mouse pointer across to select both the first and the second column.



	20 Minutes		40 Minutes
Weight lifting	72		144
Golf: riding in cart	84		168
Golf: walking	132		264
Walking: 15 minutes/mile	108		216
Running: 9 minutes/mile	264		528
Downhill skiing	144		288
Cross-country skiing	192		384
Mountain biking	204		408
Road biking: 12-14 mph	188		376

FIGURE 15–7
Mouse pointer adapts to select a column

11. With the first two columns selected, in the Rows & Columns group, click the **Insert Right** button. Two new columns are added to the right side of the second column, and the width of each column is automatically adjusted. In several rows, the text within the cells in the first column does not fit within the column width, so the text automatically wraps to a new line within the cell.

12. Position the mouse pointer over the top of the border that divides the second and third columns. When the Add Column marker displays, as shown in **Figure 15–8**, click the **Add Column** button to insert two new columns.

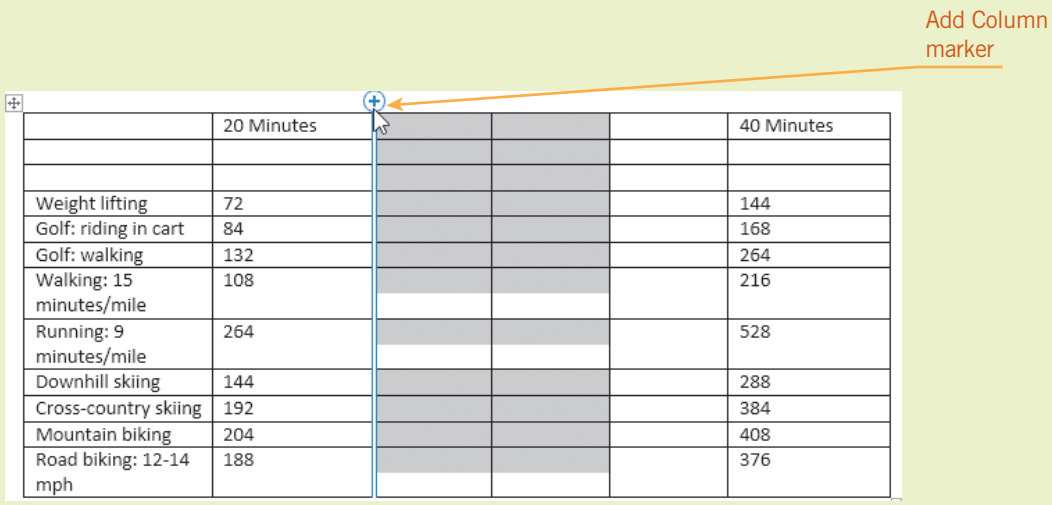


FIGURE 15–8
Add Column marker

QUICK TIP

You can use the number pad on your keyboard to enter numbers. Make sure that NUMLOCK is enabled.

13. Click in the top cell of the new third column, and type **30 Minutes**. Press the **down arrow** to move down to the fourth row, and type the following numbers to complete the column:

108

126

198

162

396

216

288

306

282

14. Save the changes, and leave the document open for the next Step-by-Step.

Deleting Rows and Columns

When you select cells and use Delete to remove content, only the cell contents are removed. The table cell boundaries remain. To remove rows or columns from a table, you must use the Delete commands on the TABLE TOOLS LAYOUT tab or in a shortcut menu. When you delete a row or column, the text in the cells is also deleted.

Step-by-Step 15.3

IC3
2-1.1.9
2-2.1.1

1. If necessary, open the **Calories 2** file from your solution files. Save the Calories 2 document as **Calories 3**, followed by your initials. If necessary, show the TABLE TOOLS LAYOUT tab.
2. Position the insertion point in the second column of the fourth row *(Weight lifting)*, after the number *72*. Press the **Backspace** key two times to delete the cell contents.
3. Position the mouse pointer in the margin on the left side of the fourth row *(Weight lifting)*. The pointer changes to a right-pointing arrow, as shown in **Figure 15–9**. Make sure the pointer on your screen matches the pointer shown in Figure 15–9. With the arrow pointed at the first cell of the fourth row, click to select all the cells in the row.

Position mouse to select a row

	20 Minutes	30 Minutes					40 Minutes
Weight lifting		108					144
Golf: riding in cart	84	126					168
Golf: walking	132	198					264
Walking: 15 minutes/mile	108	162					216
Running: 9 minutes/mile	264	396					528
Downhill skiing	144	216					288
Cross-country skiing	192	288					384
Mountain biking	204	306					408
Road biking: 12-14 mph	188	282					376

FIGURE 15–9
Mouse pointer adapts to select a row

4. With all the cells selected in the fourth row, press the **Delete** key. The text is removed from all the selected cells, but the cell boundaries remain.
5. The insertion point should be positioned in the first cell in the fourth row. In the Rows & Columns group, click the **Delete** button, and then click **Delete Rows**. The row where the insertion point is positioned is deleted.
6. Drag the mouse pointer over all the cells in the second and third rows (blank rows) to select all the cells.

7. Right-click the **selection**, and in the shortcut menu click **Delete Cells**. In the Delete Cells dialog box, select the **Delete entire row** option and then click **OK**.
8. Position the insertion point in the first cell in the first column (a blank cell). Click the **Delete** button in the Rows & Columns group, and then click **Delete Cells**. The Delete Cells dialog box opens.
9. Select the **Shift cells up** option, and then click **OK**. The cell is deleted, and the contents of the cells below the deleted cell are shifted up.
10. On the Quick Access Toolbar, click the **Undo** button to restore the blank table cell.
11. Position the mouse pointer above the fourth column and then click and drag to select the four blank columns (columns 4, 5, 6, and 7). In the Rows & Columns group, click the **Delete** button, and then click **Delete Columns**.
12. With the insertion point positioned anywhere within the table, click the **Delete** button, and then click **Delete Table**. The entire table is deleted.
13. Click the **Undo** button to restore the table.
14. Save the changes, and leave the document open for the next Step-by-Step.

Adjusting Column Width and Row Height

When you create a table grid, Word makes all the columns the same width, and the entire width of the table is based on the current settings for the margins and paper size. You can choose to automatically adjust the width of one or more columns to accommodate the contents within the cells, or you can automatically adjust all column widths at the same time. You can also choose to automatically resize the table to fit in the document window. This is useful because the table width then automatically adjusts when the window size changes.

When the table is first inserted, the height of each row is the same, but when the text wraps to a second line within a cell, the height of all the cells in that row is automatically increased to accommodate the extra line of text.

Step-by-Step 15.4

IC3
2-1.1.9
2-2.2.1

1. If necessary, open the **Calories 3** file from your solution files. Save the Calories 3 document as **Calories 4**, followed by your initials. If necessary, switch to Print Layout view.
2. Click the **VIEW** tab. In the Zoom group, click the **Page Width** button.
3. Position the insertion point in the first cell in the table (a blank cell), and then click the **TABLE TOOLS LAYOUT** tab. In the Cell Size group, shown in **Figure 15–10**, note the height of the row displayed in the Table Row Height box.

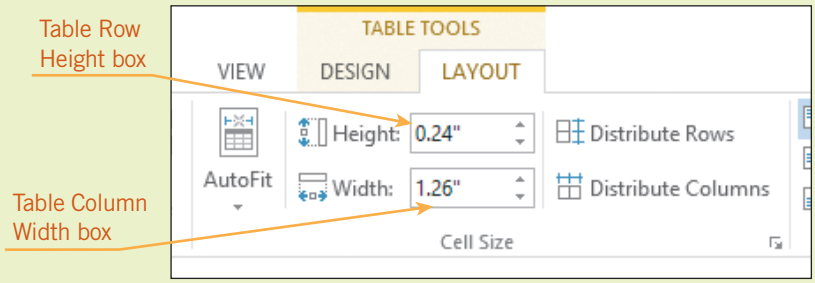
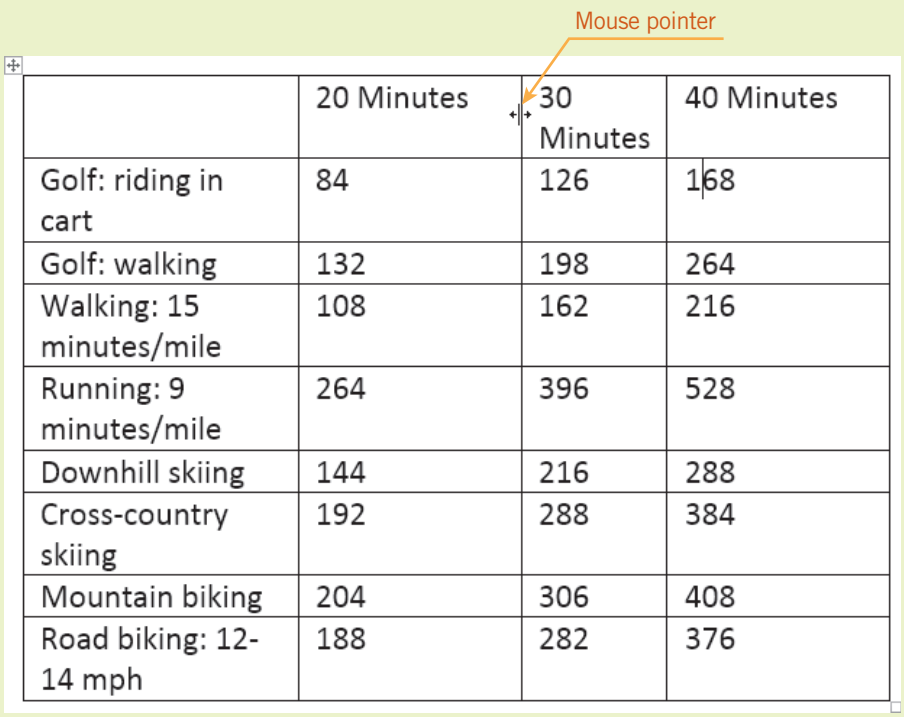


FIGURE 15–10
Cell Size group on the TABLE TOOLS LAYOUT tab

4. Move the insertion point to the first cell in the third row *(Golf: walking)*. Notice the numbers in the *Table Row Height* box change to reflect the difference in the height of the row.
5. With the insertion point positioned in the first column, note the width of the column is displayed in the Table Column Width box. Click anywhere in the second, third, and fourth columns. The numbers in the Table Column Width box may vary for each column.
6. Position the mouse pointer over the right border of the second column. The pointer changes to a double-headed arrow as shown in **Figure 15–11**. With the mouse pointer displayed as a double-headed arrow, double-click. The column width is automatically adjusted to the longest line of content in the column, and the extra white space is removed.

QUICK TIP

To automatically adjust the column widths of multiple columns, select the columns and then double-click the right border of one of the selected columns. The width for all selected columns will automatically adjust.



	20 Minutes	30 Minutes	40 Minutes
Golf: riding in cart	84	126	168
Golf: walking	132	198	264
Walking: 15 minutes/mile	108	162	216
Running: 9 minutes/mile	264	396	528
Downhill skiing	144	216	288
Cross-country skiing	192	288	384
Mountain biking	204	306	408
Road biking: 12-14 mph	188	282	376

FIGURE 15–11
Mouse pointer adapts to move a column border

7. With the insertion point positioned anywhere within the table, in the Cell Size group, click the **AutoFit** button. Then click **AutoFit Contents**. The text in the first column no longer wraps within the cells, and the extra white space in the third and fourth columns is eliminated.

QUICK TIP

When a table cell is formatted for AutoFit Contents, Word automatically adjusts the cell width each time the cell contents change.

8. With the insertion point positioned anywhere within the table, click the **AutoFit** button again, and then click **AutoFit Window**. Extra space is added to all the columns so the table fills the width of the page.
9. Click the **PAGE LAYOUT** tab, and in the Page Setup group, click the **Orientation** button, and then click **Landscape**. The page width changes and the width of each column adjusts so the table fills all the space between the left and right margins.
10. Click the **Orientation** button, and then click **Portrait** to return to the original page orientation. Once again, the column widths adjust to fit the page width.
11. Click the **TABLE TOOLS LAYOUT** tab. In the Table group, click the **Select** button, and then click **Select Table**.
12. In the Cell Size group, click the **up arrow** in the Table Row Height box to increase the row height to **0.3"**. Click anywhere in the table to deselect the table rows. The row height is increased for all selected rows.
13. Save the changes and leave the document open for the next Step-by-Step.

Merging and Splitting Table Cells

VOCABULARY
merging cells
splitting cells

When you remove the boundary between two cells, it is called ***merging cells***. You can merge cells horizontally or vertically. You can merge cells when you want to create a heading to span across two or more columns.

When you convert a cell into multiple cells, it is called ***splitting cells***. You can split a cell into two or more rows and/or two or more columns. You can also split a table into two separate tables.

Step-by-Step 15.5

IC3
2-1.1.9
2-2.1.1

1. If necessary, open the **Calories 4** file from your solution files. Save the Calories 4 document as **Calories 5**, followed by your initials.
2. Position the insertion point in the first row in the table, and then if necessary, click the **TABLE TOOLS LAYOUT** tab. In the Rows & Columns group, click the **Insert Above** button. A new row is added and the four cells in the new row are selected.
3. In the Merge group, click the **Merge Cells** button, shown in **Figure 15–12**. Click in the table to deselect the row. The four cells have merged into a single, wide cell.

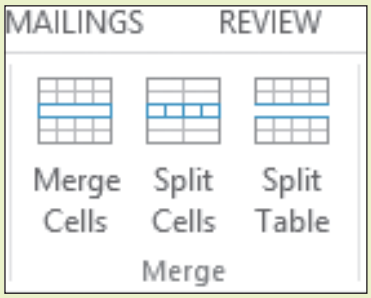


FIGURE 15–12
Merge group on the TABLE TOOLS LAYOUT tab

4. Click the selected row to position the insertion point in the new blank row. In the Merge group, click the **Split Cells** button. The Split Cells dialog box opens.
5. Change the number in the *Number of columns* box to **1**. Change the number in the *Number of rows* box to **2**. Click **OK**. Click anywhere in the table to deselect the row. You will see that the row is split into two rows.
6. Position the insertion point in the top blank row, and type **NUMBER OF CALORIES BURNED**. Press **Enter**, and then type **Body weight: 150 lbs.**. The height of the cells is automatically adjusted to accommodate the two lines of text. Note all the new text is entered in the same cell.
7. Click in the second row of the table, and then click the **Split Cells** button. Click **OK** to accept the proposed settings of two columns and one row. The row will be split evenly into two cells.
8. Position the mouse pointer over the border that splits the row into two cells. When the pointer changes to a double-headed arrow, drag the border to the left so that it aligns with the first column border, as shown in **Figure 15–13**.

New border position

NUMBER OF CALORIES BURNED Body weight: 150 lbs.			
	20 Minutes	30 Minutes	40 Minutes
Golf: riding in cart	84	126	168
Golf: walking	132	198	264
Walking: 15 minutes/mile	108	162	216
Running: 9 minutes/mile	264	396	528
Downhill skiing	144	216	288
Cross-country skiing	192	288	384
Mountain biking	204	306	408

FIGURE 15–13
Drag a cell border to resize the cell

QUICK TIP

You can also use the Draw Table tool and the Eraser tool to add, delete, split, and merge cells in an existing table.

9. Click in the cell directly below *Body weight: 150 lbs.* and type **Activity**. Click in the cell directly above the *20 Minutes* column and type **Length of Time**.
10. Position the insertion point anywhere in the seventh row *(Running: 9 minutes/mile)*, and then in the Merge group click the **Split Table** button. The rows are now displayed in two separate tables.
11. Click the **Undo** button to return the two tables to one table.
12. Save the changes, and then close the document.

Drawing a Table

There may be occasions when you need to create and customize a more complex table. For example, the table may require cells of different heights or a varying number of columns per row. The Draw Table tool is very useful for creating complex tables. The Draw Table tool enables you to use the mouse to draw the table grid on the screen, the same way you would use a pen to draw the grid on a sheet of paper. When you use the Draw Table tool, the document must be displayed in Print Layout view. The Table Eraser tool enables you to remove cell boundaries from a table.

Step-by-Step 15.6

IC3
2-1.1.9
2-2.1.1

1. Create a new blank Word document. Save the document as **Recycle 1**, followed by your initials.
2. Click the **VIEW** tab. In the Show group, make sure the Ruler option shows a checkmark indicating that the feature is enabled. Then in the Zoom group, click the **Page Width** button.
3. Click the **INSERT** tab. In the Tables group, click the **Table** button, and then in the menu below the grid, click **Draw Table**. The mouse pointer changes to a pencil.
4. Position the mouse pointer in the upper-left corner of the document near the flashing insertion point. Notice that as you move the mouse pointer, the position of the pencil (mouse pointer) is indicated on both the horizontal and vertical rulers.
5. Position the pointer over the flashing insertion point. Then click and drag the pencil down and to the right. As you drag the mouse, markers on the vertical and horizontal rulers display the table size, as shown in **Figure 15–14**. Release the mouse button when the table is approximately 6 ½ inches wide by 2 ½ inches high.

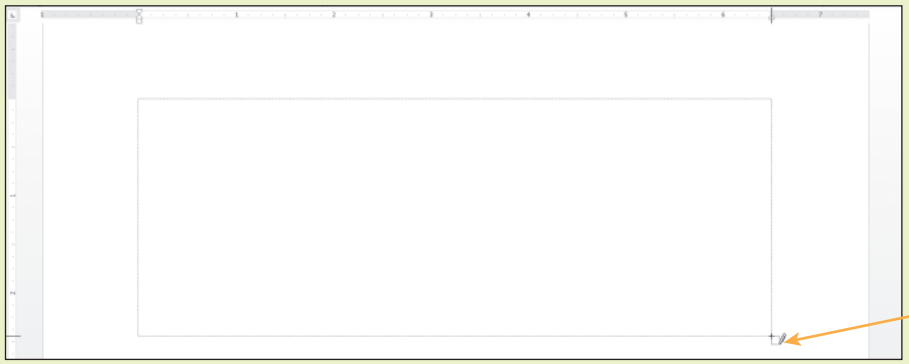


FIGURE 15–14
Creating the outside boundary of a table grid

6. You have created the outside boundary of the table. Note that the Ribbon adapts and now shows the TABLE TOOLS LAYOUT tab.
7. To create the cell lines inside the table, position the point of the pencil where you want a line to begin and then click and drag to the point where you want it to end. A broken line will follow the mouse as you drag it. Draw all of the lines illustrated in **Figure 15–15**. The four horizontal lines are ½ inch apart, and the three vertical lines are positioned at 1 inch, 4 ½ inches, and 5 ½ inches on the horizontal ruler.

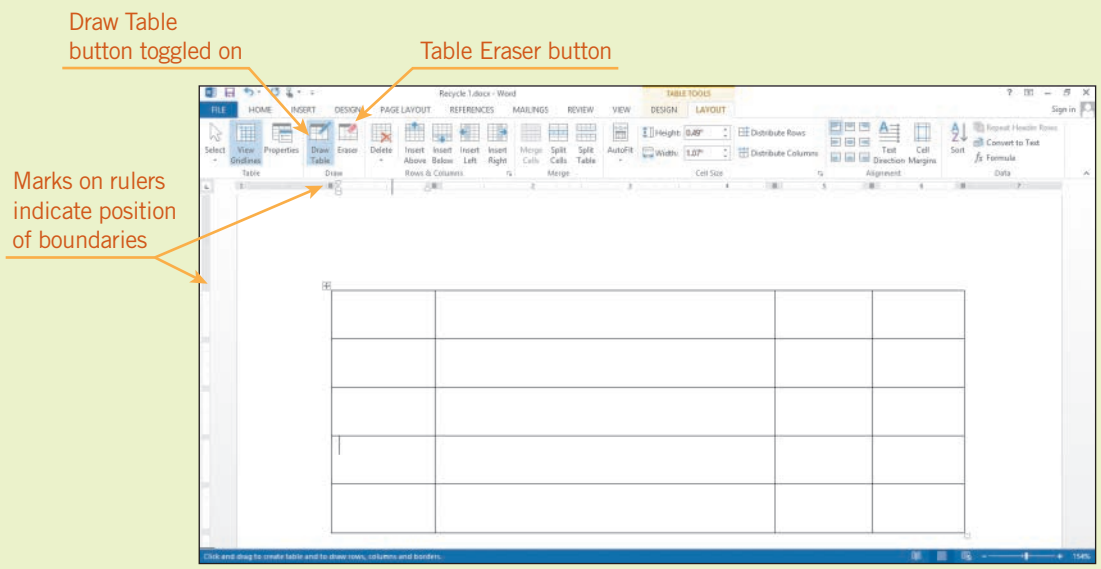


FIGURE 15–15
Table grid for Step 7

8. On the TABLE TOOLS LAYOUT tab, in the Draw group, click the **Draw Table** button to toggle off the Draw Table option.
9. In the Draw group, click the **Eraser** button. The mouse pointer changes to an eraser.

10. Position the eraser in the first row on the vertical line between the first and second cells. When the lower corner of the eraser is positioned over the line and you hold down the mouse button, the line appears selected as it does in **Figure 15–16**.

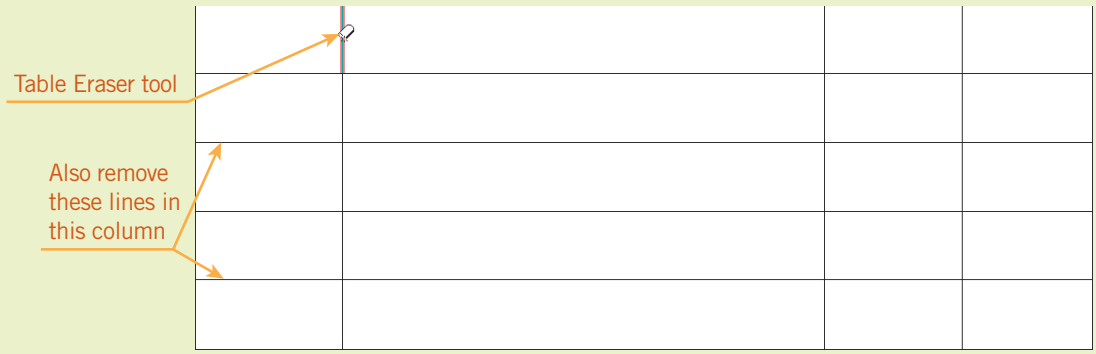


FIGURE 15–16
Table Eraser tool with selected line

11. Release the mouse button to delete the selected boundary. If the line is not deleted when you release the mouse button, reposition the eraser and try again. The line will only be deleted if the line is selected when you click.
12. Erase two more lines in the first column as indicated in Figure 15–16. Then click the **Eraser** button to toggle off the feature.
13. Enter the table text shown in **Figure 15–17**.

QUICK TIP

To toggle the Draw Table and Table Eraser features off, press the Esc key.

FIGURE 15–17
Table content for Step 13

Recycling Rate		2005	2015
PET	Beverage bottles	55%	
	Vegetable oil bottles	17%	
HDPE	Milk jugs	37%	
	Bleach and laundry detergent bottles	18%	

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14. Save the changes and leave the document open for the next Step-by-Step.

Formatting Tables

You can make a table easier to read by enhancing its appearance. For example, aligning numbers within a cell can make the data easier to read. Changing the border colors and adding shading to some of the cells can help the reader quickly identify different types of data.

Aligning Data within Table Cells

The Alignment group in the TABLE TOOLS LAYOUT tab provides several commands you can use to align text within the cells. You can align text at the top, center, or bottom of a cell, as well as to the left or right. You can also change the direction of text in a table cell. The direction of the text toggles between three text positions: top to bottom, bottom to top, and horizontal (the default position).

Step-by-Step 15.7

IC3
2-1.1.9
2-2.1.1
2-2.2.1

1. If necessary, open the **Recycling 1** file from your solutions files. Save the Recycling 1 document as **Recycling 2**, followed by your initials.
2. If necessary, position the insertion point in the table. Then click the **TABLE TOOLS LAYOUT** tab.
3. Drag the mouse pointer down the left side of the table to select all the rows in the table.
4. In the Cell Size group, click the **Table Row Height** box, type the setting **0.5"**, and press **Enter**. All the rows are now exactly the same height.
5. All the rows should still be selected. In the Alignment group, click the **Align Top Right** button shown in **Figure 15–18**. The text in each cell is aligned at the right side of the cell beginning at the top boundary of the cell.

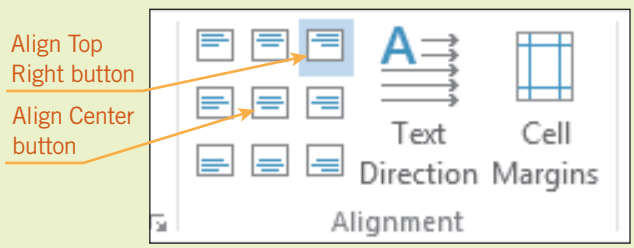


FIGURE 15–18
Alignment group on the TABLE TOOLS LAYOUT tab

6. Click the **Align Center Left** button. The text aligns at the left side of the cells and is centered between the top and bottom boundaries of the cells.
7. Deselect the rows. Point to the cell with *PET*, and drag down to select that cell and the cell below with *HDPE*.
8. With both cells selected, in the Alignment group, click the **Text Direction** button. The text rotates to the right and is displayed from top to bottom.
9. Click the **Text Direction** button again. The text rotates to the right and now reads from bottom to top.
10. Notice that the buttons in the Alignment group are altered to reflect the new text direction. Click the **Align Center** button. (The button is in the same location shown in Figure 15–18.) The text is centered between the left and right and top and bottom boundaries of the cells.

11. Click in the first cell *(Recycling Rate)*, and then click the **Align Center** button.
12. Select the last two columns (*2005* and *2015*), and then click the **Align Center Right** button . The text in the selected cells is aligned at the right side of the cells and centered between the top and bottom boundaries.
13. Click anywhere within the table to deselect the cells. In the Cell Size group, click the **AutoFit** button, and then click **AutoFit Contents**. Your table should look like the table shown in **Figure 15–19**.

FIGURE 15–19
Table with text rotated and aligned

	Recycling Rate	2005	2015
PET	Beverage bottles	55%	
	Vegetable oil bottles	17%	
HDPE	Milk jugs	37%	
	Bleach and laundry detergent bottles	18%	

14. Save the changes and leave the document open for the next Step-by-Step.

Formatting Borders and Shading

As you worked with the Calories and Recycle tables you created in this lesson, the lines you saw on the screen were actually borders. By default, Word formats a ½-point single-line border around all cells in a table. Generally, the default border is appropriate for the tables you create. However, there may be occasions when you want to customize the border and add shading or color to some of the table cells. You may even want to remove the border completely. When you remove the borders from table cells, the boundary lines for the cells still remain. These boundary lines in a table are called ***gridlines***. Gridlines are used for layout purposes so you can see the cell boundaries as you work with the table. Gridlines are displayed on the screen, but they do not print.

VOCABULARY
gridlines

Step-by-Step 15.8

1. If necessary, open the **Recycle 2** file from your solution files. Save the Recycle 2 document as **Recycle 3**, followed by your initials.
2. If necessary, click the **TABLE TOOLS LAYOUT** tab. In the Table group, click the **View Gridlines** button. The feature is enabled when the button has a blue highlight.
3. In the Table group, click the **Select** button and then click **Select Table** to select all the cells in the table. Then click the **TABLE TOOLS DESIGN** tab. In the Borders group, shown in **Figure 15–20**, click the **Borders** button arrow and then click **No Border**.

IC3
2-1.1.9
2-1.2.1
2-2.1.1



FIGURE 15–20
TABLE TOOLS DESIGN tab

4. Click in the table to deselect the cells. Your document should now show gridlines that indicate the cell boundaries, as shown in **Figure 15–21**. If you do not see gridlines in your table, click the TABLE TOOLS LAYOUT tab, and confirm that the View Table Gridlines feature is toggled on.

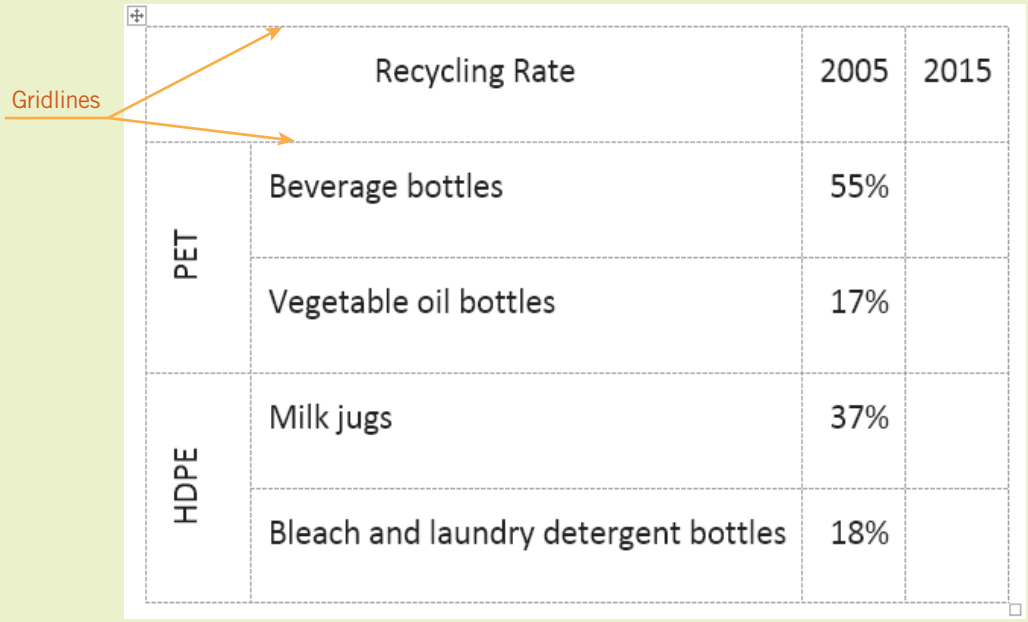


FIGURE 15–21
Table gridlines

5. Select the **first row** in the table. On the TABLE TOOLS DESIGN tab, in the Table Styles group, click the **Shading** button arrow. Under *Theme Colors*, in the second row, select the **Green, Accent 6, Lighter 80%** color. The shading is applied to the selected cells.

6. Select the cells containing *PET* and *HDPE*. Press the **Repeat** button on the Quick Access Toolbar to repeat the format.
7. Select all the cells in the table. In the Borders group, click the **Line Weight** button arrow ½ pt, and then click **¾ pt**. You must change the line weight setting before applying the border.
8. Click the **Pen Color** button arrow. Under *Theme Colors*, in the first row, select the **Green, Accent 6** color. You must also choose the border color before applying the border.
9. Click the **Borders** button arrow, and then click **All Borders**. The ¾-pt dark green border line is applied to all selected cells.
10. Deselect the table cells. Select all the cells in the first row. Click the **Line Weight** button arrow, and then click **1 pt**.
11. The pen color is still set for dark green. Click the **Borders** button. The 1-pt dark green border is applied to all borders of the selected cells because that was the last border format applied.
12. Select the cells containing **PET** and **HDPE**. Repeat the border format.
13. Deselect the table cells. Save the changes, and close the document.
14. If you were to open a new document now and click one of the Border button options, the border style, weight, and pen color would be the same as the last border that was applied. Exit the Word application, and then start the application again. The Border settings are now restored to the default settings.

Applying Table Styles

As you can see, formatting borders and shading can take time. That is why Word provides several table designs that enable you to apply multiple table formats with a single click. These styles are referred to as built-in styles, and the styles include formats for fonts, shading, and borders.

VOCABULARY
banded rows
banded columns

Some table styles include shading formats for ***banded rows*** and/or ***banded columns*** in which even-numbered rows are formatted differently than odd-numbered rows. The shading applied to alternate rows and/or columns enhances the readability of the table data.

Step-by-Step 15.9

IC3
2-1.1.9
2-1.2.1
2-2.1.1
2-2.2.1

1. Open the **Calories 5** file from your solution files. Save the Calories 5 document as **Calories 6**, followed by your initials.
2. Select the first two rows. On the HOME tab, in the Paragraph group, click the **Center** button.

3. Position the insertion point anywhere in the table. Click the **TABLE TOOLS LAYOUT** tab, click the **AutoFit** button, and then click **AutoFit Contents**.
4. Position the insertion point in the cell with the data *84*. Click and hold the mouse button and drag the mouse down to the last cell in the column and then across to the last cell in the table (*376*). In the Alignment group, click the **Align Top Right** button. Deselect the cells.
5. Click the **TABLE TOOLS DESIGN** tab. In the Table Styles group, position the mouse pointer over the third style button, *Plain Table 1* (a ScreenTip will show the name *Plain Table 1*). As the mouse pointer hovers over the style button, the new style's Live Preview is displayed in the document window as shown in **Figure 15–22**.

QUICK TIP

You can also use the Click-Shift-Click shortcut to select text. Click in the cell with the data 84, then press and hold Shift and click in the cell with the data 376.

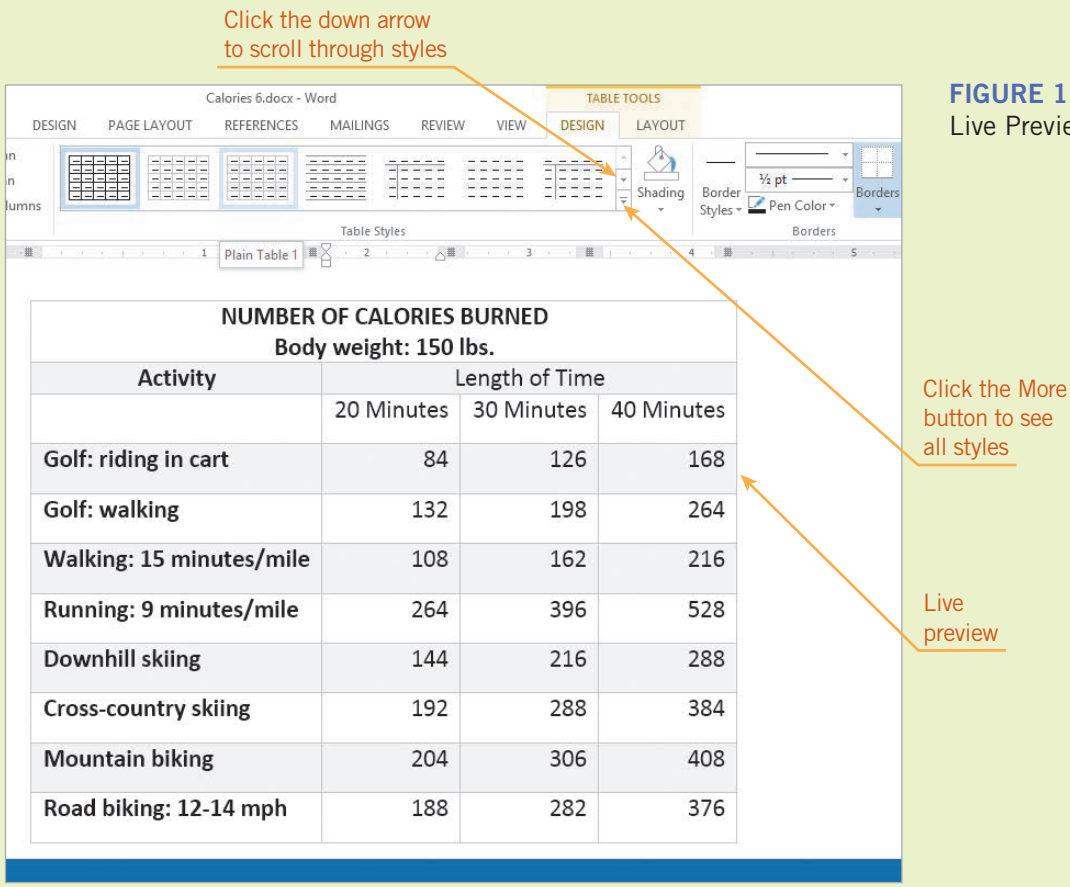
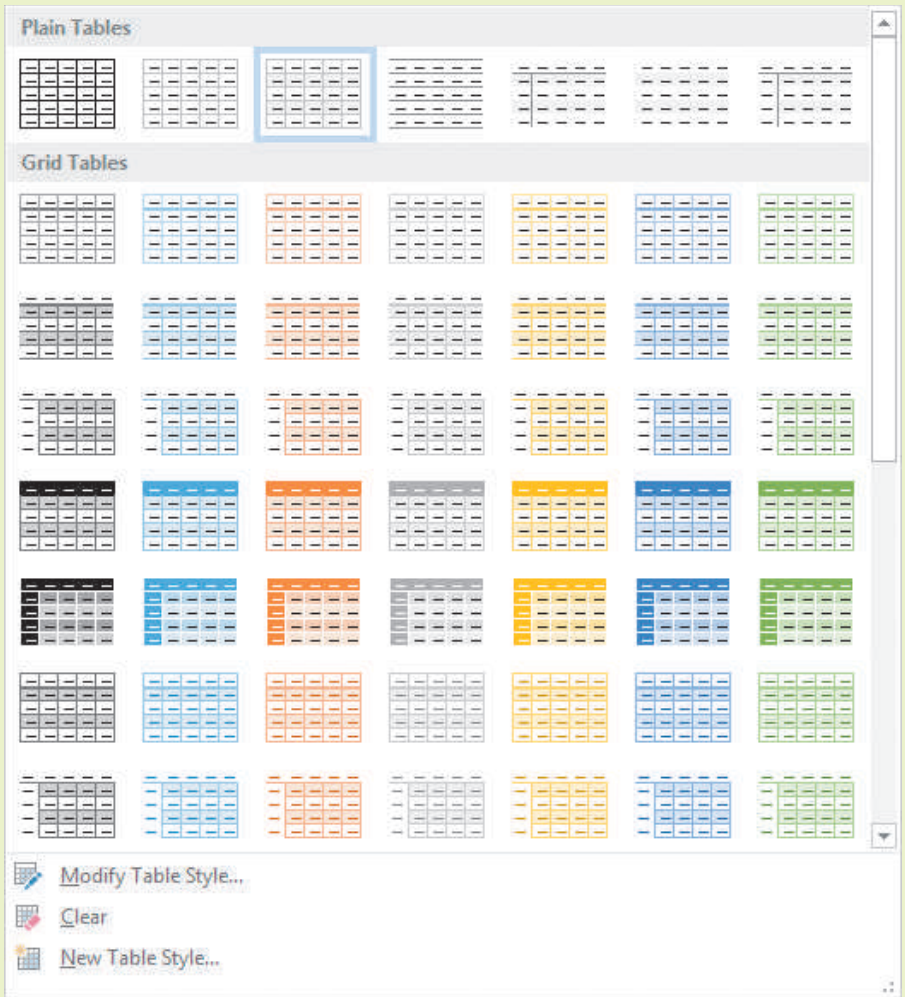


FIGURE 15–22
Live Preview of a table style

6. Move the mouse pointer over each of the other styles that appear in the Table Styles group to see the Live Preview of each style.
7. In the Table Styles group, click the **down arrow** to show the next set of styles. Then click the **More** button to show all the built-in styles.

8. Several rows of buttons are displayed, as shown in **Figure 15–23**. Under *Grid Tables*, in the fourth row of styles, second column, click the **Grid Table 4 – Accent 1** table style. The borders and shading are automatically applied to the table.

FIGURE 15–23
Built-in table styles



9. In the Table Style Options group, click the **Banded Rows** option to toggle the feature off. The shading in the rows is removed.
10. In the Table Style Options group, click the **Banded Columns** option to toggle the feature on. Alternate columns are now formatted with shading.
11. Click the **Banded Columns** option, and then click the **Banded Rows** option to restore the original style formats.
12. Save the changes, and close the document.

Using Quick Tables

Word also provides built-in tables called ***Quick Tables*** that include a table grid with sample data and table formats. To save time creating a table, you insert a Quick Table in a document and then you replace the sample data with your own data. You can modify the table structure and styles as needed.

Editing text in the cells of a table is a similar process to entering text in a document. You can enter and delete text, or select and replace the text. The Cut, Copy, and Paste commands are available, and you can also use drag-and-drop editing.

When you show nonprinting characters, you can see that every row ends with a marker. When copying, cutting and pasting, or moving entire rows, these end-of-row markers must be included in the selection for the entire row to be selected.

VOCABULARY
Quick Tables

Step-by-Step 15.10

1. Create a new blank document. Save the document as **Membership 1**, followed by your initials.
2. Click the **INSERT** tab. In the Tables group, click the **Table** button and then, at the bottom of the menu below the grid, point to **Quick Tables**. The submenu shown in **Figure 15–24** is displayed.

IC3
2-1.1.2
2-1.1.6
2-1.1.9
2-1.2.1
2-1.2.2
2-2.1.1
2-2.2.1

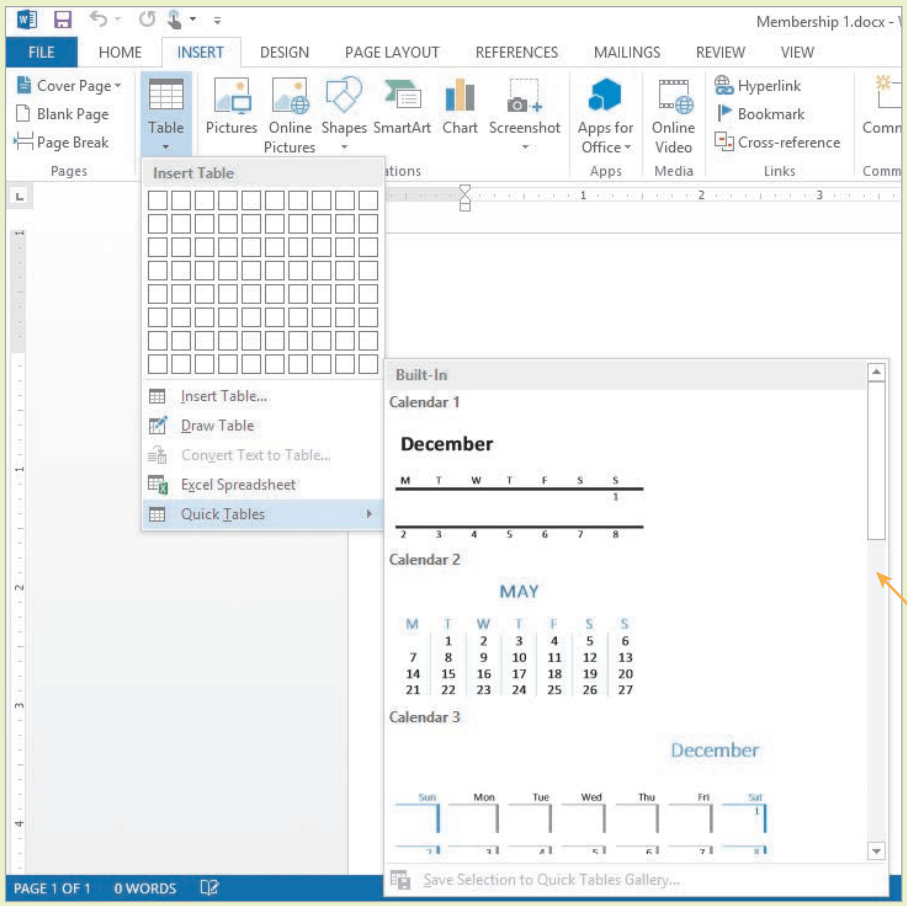


FIGURE 15–24
Built-in menu for Quick Tables

3. Scroll down the submenu and click the **Matrix** Quick Table. A table with sample data is inserted in the document. Select all the rows in the table. Press **Delete** to remove all the text from the cells.
4. Click the **TABLE TOOLS LAYOUT** tab. Select the **two columns** at the right side of the table. In the Rows & Columns group, click the **Delete** button, and then click **Delete Columns**.
5. Enter the data shown in **Figure 15–25** to complete the table. You will need to add a new row at the bottom of the table grid.

FIGURE 15–25
Table content for Step 5

Member Name	Member #	# Family Members	# Years of Membership
Zimmerman	13110	3	7
Li	13619	6	5
Johnson	13202	5	8
Arnold	13601	2	5
Hernandez	13295	3	7
Diaz	13355	4	6

6. Select all the cells in the table, click the **HOME** tab, and then change the font to **Arial**. Deselect the cells.
7. Click the **TABLE TOOLS LAYOUT** tab. Select the **first column**. In the Alignment group, click the **Align Bottom Left** button. Select the **second**, **third**, and **fourth columns**, and then click the **Align Bottom Center** button. Deselect the cells.
8. In the last row of the table *(Diaz)*, in the third column, select the number **4**, and then type **5**.
9. In the last row of the table, in the fourth column, select the number **6**. Right-click the selection, and then in the shortcut menu click **Copy**. In the second row, *(Li)*, in the fourth column, select the number **5**. Right-click the selection, and then in the shortcut menu, under *Paste Options*, click the **Keep Source Formatting** button.
10. Drag across all the cells in the last row to select all the text. Click the **HOME** tab, and then in the Clipboard group click the **Cut** button. Note the cell contents are stored on the Clipboard, but the cell boundaries for the row are still displayed, because you selected and deleted only the cell contents. Click the **Undo** button.
11. Deselect the table cells. In the Paragraph group, click the **Show/Hide** button to toggle on the display of nonprinting characters as shown in **Figure 15–26**.

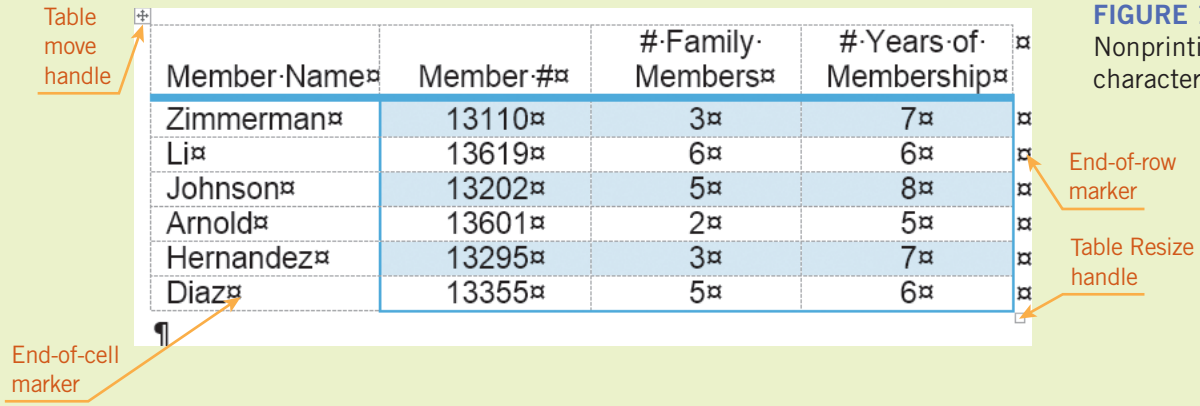


FIGURE 15–26
Nonprinting characters in a table

12. Position the mouse pointer in the margin to the left of the last row in the table *(Diaz)*, and then click to select the entire row. Note that the end-of-row marker is included in the selection. Cut the selected content to the Clipboard to remove the entire row. Position the insertion point in the first cell in the first row *(Member Name)*. Right-click to show the shortcut menu. Under *Paste Options*, click the **Merge Table** button. The *Diaz* row is inserted above the *Zimmerman* row.
13. Select the entire last row *(Hernandez)*. Then drag and drop the selected cells and position the insertion point to the first cell in the *Zimmerman* row. When you release the mouse button, the *Hernandez* row will be displayed above the *Zimmerman* row. Deselect the cells.
14. Save the changes, and leave the document open for the next Step-by-Step.

QUICK TIP

The end-of-cell markers move to the right as you enter text in the cell. End-of-cell markers do not print.

Aligning and Resizing Tables on the Document Page

To align a table on the page horizontally, you must first select the entire table. Once the entire table is selected, you can format the alignment in the same way you align text paragraphs.

You may have noticed a marker that sometimes appears at the upper-left corner of a table. This marker is the table move handle and you can drag the marker to reposition the table on the page. You can also use the table move handle to select the entire table.

The resize handle is another marker that sometimes appears in the lower-right corner of a table and when you drag this marker, you can resize the table.

Step-by-Step 15.11

1. If necessary, open the **Membership 1** file from your solution files. Save the Membership 1 document as **Membership 2**, followed by your initials.
2. With the insertion point positioned anywhere within the table, click the **TABLE TOOLS LAYOUT** tab.

IC³
2-1.1.6
2-1.1.9
2-2.1.1
2-2.2.1

3. Click and drag the **table move handle** (see Figure 15–26) to reposition the table in the lower-right corner of the screen.
4. Move the mouse pointer over the cells again to show the table move handle, and then click the **table move handle** to select the entire table. Notice the end-of-row markers are also selected.
5. Click the **HOME** tab. In the Paragraph group, click the **Center** button. The table is centered horizontally. Deselect the table.
6. Point to the lower-right corner of the table. When the table resize handle appears, as shown in Figure 15–26, position the mouse pointer over the *handle*. The pointer will change to a double-headed arrow. Drag the **handle** about one inch to the right to increase the width of the table. The table is still centered horizontally.
7. Click the **TABLE TOOLS LAYOUT** tab. In the Table group, click the **Properties** button. The Table Properties dialog box shown in **Figure 15–27** opens. Confirm that under *Text wrapping*, the **Around** option is enabled. You can also select alignment settings in this dialog box.

QUICK TIP

You can also use the Table Move Handle and the Table Resize Handle to select all the cells in a table. Simply click either one of the handles and the entire table is selected.

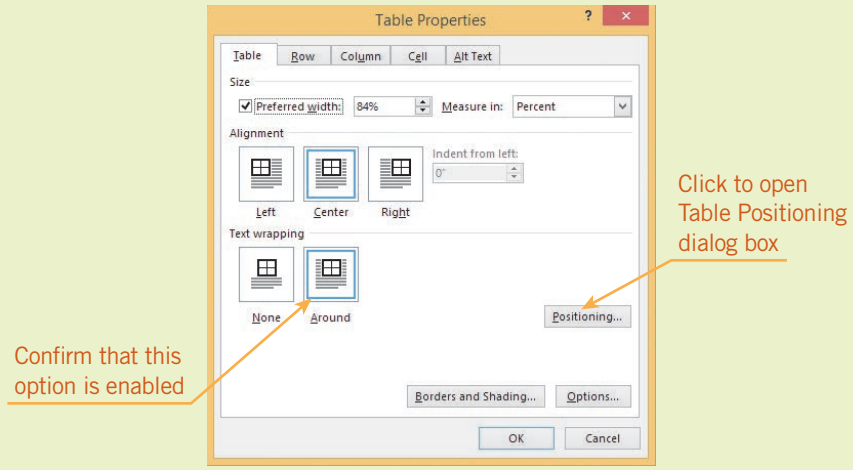


FIGURE 15–27
Table Properties dialog box

8. In the dialog box, click **Positioning** to open the Table Positioning dialog box shown in **Figure 15–28**. Under *Vertical*, click the **Position** list arrow and then click **Center**. Your settings should match those shown in Figure 15–28.

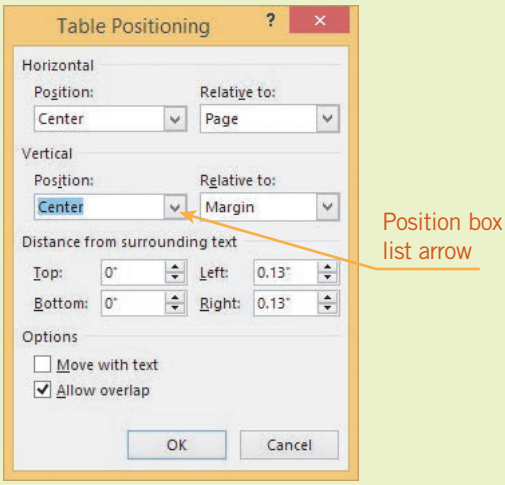


FIGURE 15–28
Table Positioning dialog box

9. Click **OK**, and then click **OK** again to close the Table Properties dialog box.
10. Click the **FILE** tab, and then click **Print** to preview the document. The table is centered both horizontally and vertically on the page. Press **Esc** to close Backstage view.
11. Save the changes, and leave the document open for the next Step-by-Step.

Sorting Data in a Table

Tables organize material to make it easier to read, and you have discovered how formatting the table and the characters in the table can add clarity to the information. You can also sort the information in a table on different search criteria to organize the table contents to change the emphasis of the data.

Sorting data in ***ascending order*** rearranges it into alphabetical order from A to Z, or numerical order from lowest number to highest number. Sorting data in ***descending order*** rearranges the data in alphabetical order from Z to A, or numerical order from highest number to lowest number. When using default settings, header rows are not included when the data is sorted.

VOCABULARY
ascending order
descending order

Step-by-Step 15.12



1. If necessary, open the **Membership 2** file from your solution files. Save the Membership 2 document as **Membership 3**, followed by your initials.
2. Note the information in the third row for the *Hernandez* member: (member # *13295*, *3* members in the family, and *7* years of membership).

IC3
2-1.1.9
2-2.1.1
2-2.1.2

3. Position the insertion point anywhere in the table, and if necessary click the **TABLE TOOLS LAYOUT** tab.
4. In the Data group shown in **Figure 15–29**, click the **Sort** button. The Sort dialog box opens, as shown in **Figure 15–30**.

FIGURE 15–29
Data group on the TABLE TOOLS LAYOUT tab

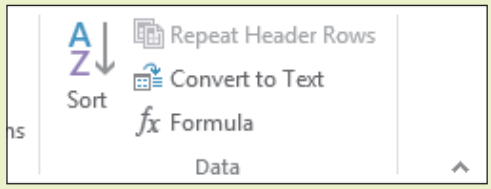
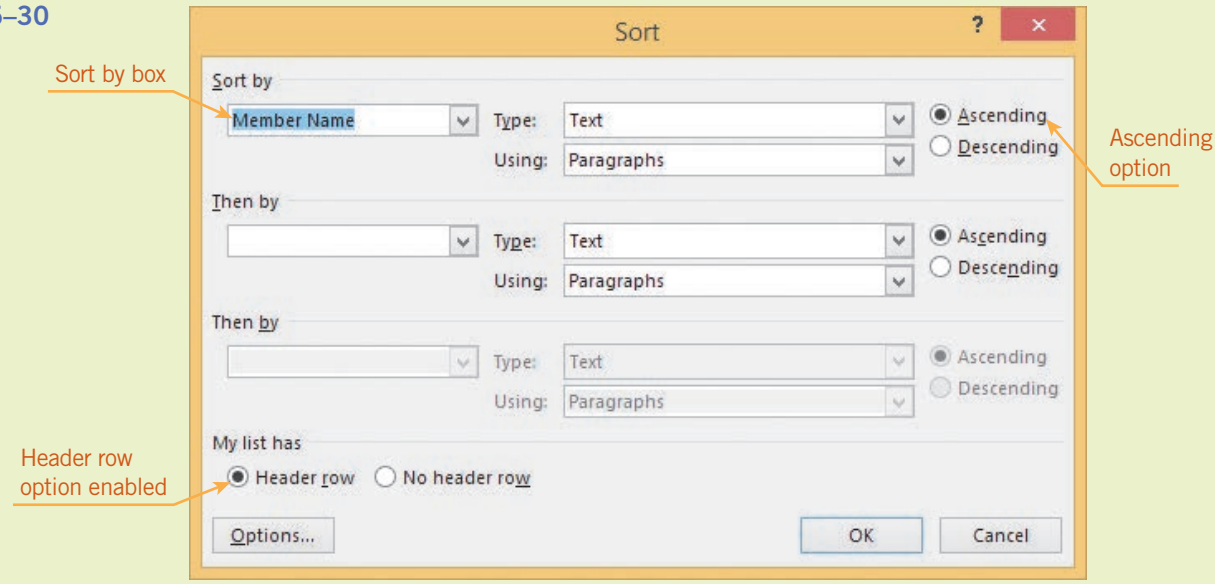


FIGURE 15–30
Sort dialog box



5. Confirm that the Sort settings on your screen match those shown in Figure 15–30. Note that the *Sort by* text box shows *Member Name*, and the *Type* box to the right shows *Text*. At the bottom of the dialog box, under *My list has*, the Header row option is enabled. When this option is enabled, column headings are not included in the sort.
6. Click **OK**. The entries in the first column of the table are now displayed sorted in ascending alphabetical order. The related data in the other columns is moved with the member names. For example, the number of family members, the member #, and the number of years of membership moved with the Hernandez family name.
7. Click the **Sort** button again. In the *Sort by* text box, click the **Sort by** list arrow, and then click **Member #**. Note that the option in the *Type* text box changes to *Number*.

8. To the right, in the Sort by group, click the **Descending** option, and then click **OK**. The table rows are now arranged so the numbers in the *Member #* column are in order from the highest number to the lowest number, and the related data in the other columns is moved with the member #.
9. Deselect the table cells. Save the changes, and close the document.

Converting Text to a Table and a Table to Text

Assume that you have already created a multicolumn list using tab settings. You decide that you want to organize the data in a table because it will be easier to format. In Word, it is not necessary to enter all the data again. Word can quickly convert text separated by paragraph markers, commas, tabs, or other characters into a table with cells.

When converting text to a table, Word determines the number of columns needed based on paragraph markers, tabs, or commas, or other characters in the text. Word also provides a command to convert a table to text. When converting a table to text, Word inserts paragraph markers, tabs, commas, or other characters to indicate the column breaks, and you can choose which symbols or characters to use to indicate the column breaks.

Step-by-Step 15.13

IC3
2-1.1.9
2-2.1.1

1. Open the **BB Scores** file from the drive and folder where your Data Files folder is stored. Save the BB Scores document as **Revised BB Scores 1**, followed by your initials.
2. If necessary, show the nonprinting characters. Note that each line includes tab symbols, which organize the data into three columns.
3. Select all the lines of text.
4. Click the **INSERT** tab. Click the **Table** button, and then click **Convert Text to Table**. The Convert Text to Table dialog box shown in **Figure 15–31** opens.

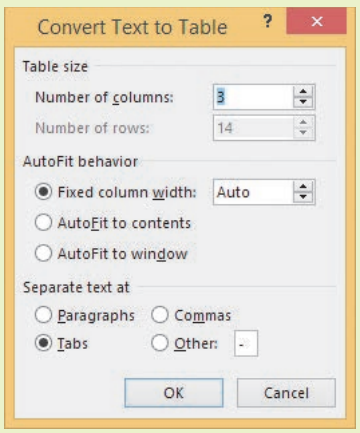
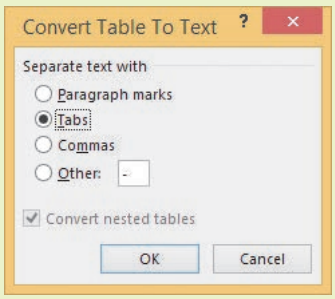


FIGURE 15–31
Convert Text to Table dialog box

5. Under *Table size*, the number of columns is already set to *3*. Under *AutoFit behavior*, enable the option **AutoFit to contents**. Under *Separate text with*, make sure the **Tabs** option is enabled.
6. Click **OK**. Click anywhere in the window to deselect the text so you can see the revised content. The selected data is now formatted in table cells.
7. Save the changes to the document.
8. Save the document as **Revised BB Scores 2**, followed by your initials.
9. With the insertion point positioned anywhere within the table, click the **table move handle** to select the entire table.
10. Click the **TABLE TOOLS LAYOUT** tab. In the Data group, click the **Convert to Text** button. The Convert Table to Text dialog box shown in **Figure 15–32** opens. A hyphen, or another character, may be displayed in the *Other* box.

FIGURE 15–32
Convert Table to Text dialog box



11. Enable the option **Other**. The insertion point is positioned in the *Other* box, and if a hyphen or other character is displayed in the *Other* box it will be selected. Press **Shift+8** to replace the hyphen with an asterisk (*). Click **OK**. The columns of text are now separated with an asterisk instead of a tab character.
12. Click anywhere in the document window to deselect the document content. Save the changes, and close the document.

NET BUSINESS

Internet Fraud

Internet fraud refers to any type of scam or hoax that uses one or more components of the Internet, such as e-mail, blogs, or Web sites. The most common types of Internet fraud are auction and retail schemes, business opportunities and work-at-home schemes, identity theft, investment schemes, and credit or debit card fraud. Internet fraud is a federal crime. If you think you have been the victim of Internet fraud, you can file a complaint online at the FBI Web site, www.fbi.gov.

White-collar crime refers to a full range of frauds committed by business and government professionals, and Internet fraud is one of the white-collar crimes that the FBI investigates. The Internet Crime Complaint Center (or IC3) is a partnership of the FBI and the National White Collar Crime Center.

SUMMARY

In this lesson, you learned:

- The table feature in Word enables you to organize and arrange text and numbers easily.
- To change the layout of information after you create a table, you can insert and delete rows and columns. The AutoFit feature automatically adjusts the width of a column based on the contents of the cells in a column.
- The Draw Table tool and the Eraser tool are especially useful when you need to create a complex table.
- You can format text alignment in table cells the same way you apply those formats in other Word documents.
- Borders and shading greatly enhance the appearance of a table and often make the table easier to read. Word provides several built-in styles to make it fast and easy to apply borders and shading to a table.
- Word provides Quick Tables that are already formatted and contain sample data, so you can quickly create a table.
- You can copy, cut, paste, and move contents within a table.
- You can use the Sort feature to reorganize the table contents to emphasize data in different ways.
- Word can convert text to a table and vice versa.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. When you remove the boundary between two cells, you are splitting the cells.

T F 2. When you select cells and use Delete to remove content, only the cell contents are removed and the table cell boundaries remain.

T F 3. To move text in a table, you can use the Cut and Paste commands, and you can also use drag-and-drop editing.

T F 4. When you show the gridlines in a table, the gridlines will appear in the printed document.

T F 5. In a table, columns go down and rows go across.

T F 6. When you delete a row or column, the text in the cells is also deleted.

T F 7. To insert a new row at the end of the table, you can position the insertion point in the last table cell and press Enter.

T F 8. When converting text to a table, Word automatically estimates the number of columns required.

T F 9. Word can create a table from text in which data is separated by paragraph markers, tabs, or commas.

T F 10. Using default settings, header rows are included when data is sorted.

MULTIPLE CHOICE

Select the best response for the following statements.

1. When using the mouse to draw the table grid on the screen, the document must be _____.
   - A. in Draft view
   - B. in Print Layout view
   - C. at the zoom setting of 100%
   - D. in Print Preview
2. If you have already entered the data in a table, you can quickly add predesigned borders and shading by _____.
   - A. applying a table style
   - B. using the Table Design command
   - C. using Quick Table formats
   - D. using the AutoFormat feature
3. The _____ option adds extra space to table columns so the table fills the width of the page.
   - A. AutoSize Window
   - B. AutoFit Window
   - C. AutoFit Contents
   - D. AutoWidth Column

4. You can use the _____ tool to remove cell boundaries.
   A. Remove Border
   B. Table Eraser
   C. Table
   D. Cell Margins
5. Converting one cell into multiple cells is called _____ cells.
   A. grouping
   B. combining
   C. merging
   D. splitting

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. _____ are used for layout purposes so you can see the cell boundaries as you work with the table.
2. To create a complex table, use the _____ tool to position cell boundaries just where you want them.
3. Sorting text in _____ order arranges it in alphabetical order from A to Z.
4. The first row in a table or data source with the column headings is referred to as the _____.
5. To reposition a table on the page, you can drag the _____.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. When would you find the merging cells feature useful?

2. How do banded rows or columns make table data easier to read?

3. Explain why the Draw Table tool can be very useful for creating a table.

4. How is table data displayed when you convert a table to text?

5. What is the difference between a built-in table style and a Quick Table?

PROJECTS

PROJECT 15–1

1. Open the **Demographics** file from the drive and folder where your Data Files folder is stored. Save the Demographics document as **Revised Demographics**, followed by your initials.
2. Position the insertion point in the blank paragraph at the end of the document, and then create a table grid for a 3×6 table (3 columns and 6 rows).
3. Complete the table by entering the data shown in **Figure 15–33**.

	2012	2014
18-24	28,577	27,009
25-34	45,117	41,032
35-44	40,344	45,906
55-64	51,290	59,865
65+	40,098	44,211

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FIGURE 15–33 Table Content For Step 3

4. You realize you left out the data for the 45–54 age group. Insert a row in the proper location, and type the following data:

   45–54 28,198 29,119

IC3
2-1.1.9
2-1.2.1
2-2.1.1
2-2.2.1

5. It would be helpful to see the percent change in population. Add a column to the right of the 2014 column, and type the column heading **% Change** in the first row of the new column. Insert the following information in the cells of the new column:

   –5.5
   –9.1
   +13.8
   +3.3
   + 16.7
   + 10.3

6. Insert a new row above the first row of the table, and then merge all cells in the new row. Type the table title **Population by Age**. Apply the Align Center and bold formats to the contents in the first two rows of the table.
7. In the first cell of the second row, type the column heading **Age**.
8. Automatically adjust the column widths to the content.
9. Select the first two rows, and apply the Align Center format. Then select all the data in rows 3 through 8, and apply the Align Center Left format. In the first column only, apply the bold format to all the data in rows 3 through 8.
10. The data in the *% Change* column would look better if the decimal points were aligned. Right-align the numbers (but not the column heading) in this column by applying the Align Center Right format.
11. Apply a table style of your choice, but make sure the style includes banded rows.
12. Format the table properties so that text will wrap around the table, and also center the table horizontally on the page.
13. Save the changes, and close the document.

PROJECT 15–2

1. Open the file **Historical Hurricanes** from the drive and folder where your Data Files folder is stored. Save the Historical Hurricanes document as **Revised Historical Hurricanes**, followed by your initials.
2. Select only the tabbed data (not the blank line or the source line), and convert the text to a table. Accept the suggested number of columns, AutoFit to contents, and separate the text at tabs.
3. Insert a new row at the top of the table, and then merge all cells in the new row. Type the title **Costliest U.S. Hurricanes**, and then type **($ in Billions)**.
4. Center the text in the first two rows by applying the Align Center format.
5. Select the data under the *Category* heading and apply the Align Top Center format. Select the data under the *Damage* heading and apply the Align Top Right format.

IC3
2-1.1.9
2-1.2.1
2-2.1.1
2-2.1.2
2-2.2.1

6. The data for *Hurricane Andrew* is incorrect. Change the year for *Andrew* to **1992**.
7. The data in the table is currently arranged in ascending order according to the *Year* column. Select all the cells with numbers in the *Damage* column, and sort the data for Column 4 so the storms are listed in order, with the most expensive storm first.
8. You decide that the first 12 entries in the table give enough information about the destructive power of hurricanes. Delete the last five rows in the table.
9. Apply a table style that will enhance the table and make it easier to read. If necessary, modify the table style to emphasize all the column headings.
10. Save the changes, and close the document.

PROJECT 15–3

IC3
2-1.1.9
2-1.2.1
2-1.2.2
2-2.1.1
2-2.2.1

1. Create a new blank Word document. Save the document as **Invoice**, followed by your initials.
2. Use the Draw Table tool (and the Eraser tool, if necessary) to create the table grid shown in **Figure 15–34**. (*Hint:* Change the zoom to 50% so you can view most of the page as you create the grid.) The row height should be approximately ½ inch.
3. After completing the grid, enter the text. Then automatically format the table to fit the window.
4. Select all the cells in the first column, set the text direction as shown, and center all the text vertically and horizontally using the Align Center option. Select all remaining cells, and center all text horizontally in the table cells using the Align Center Left option.
5. Select the entire table, and set the row height at 0.6". If a prompt appears regarding a break between pages, click **OK**.
6. Enhance the appearance of the table by adding or removing borders, adding shading, formatting text, using bold and/or italic, and changing the font size and/or color.
7. Position the table both horizontally and vertically on the page.
8. Save the changes, and close the document.

Customer	Name					
	Address					
	City, State, ZIP					
	Phone					
Clothing	Item #	Color	Size	Qty.	Price	Total
Accessories						
Thank you for shopping with us!					TOTAL	

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FIGURE 15–34 Table grid and content for Step 2

PROJECT 15–4

2-1.1.9
2-1.2.2
2-2.1.1
2-2.2.1

1. Create a new blank Word document. Save the document as **Conference Agenda**, followed by your initials.
2. Insert the Matrix Quick Table. Edit the columns and rows, and replace the sample data to create a table that matches the table shown in **Figure 15–35**.
3. Select all the cells, and change the font to Arial. Select the column headings, and apply the bold format.
4. Set the page layout to landscape orientation.
5. Select the entire table, and AutoFit the column widths for content. Then with all the table cells selected, use the AutoFit feature to make the table automatically fit the window.
6. Change the row height for all rows except the header row to 0.3".
7. Align the text in all cells, except the headings, using the Align Center Left format.
8. Align all the text in the header row using the **Align Center** format.
9. Save the changes, and close the document.

Session	Time	Topic	Speaker	Room
1	8:15 a.m. - 9:45 a.m.	Regulatory Framework	Jamie Pierce	Arctic
2	10:10 a.m. – 11:55 a.m.	Fact or Fiction?	John Browder	Atlantic
3	1:30 p.m. – 2:45 p.m.	Strategies for Security	Patricia Hays	Pacific
4	3:10 p.m. – 4:55 p.m.	Moving Forward	Taylor Erwin	Indian

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FIGURE 15–35 Table content for Step 2

TEAMWORK PROJECT

2-1.1.9
2-1.2.2
2-2.1.1
2-2.1.2

If you completed Project 15–2, you created a table to organize information about costly hurricanes because of property damage. The data shown in the Hurricane History table was compiled from several sources by the National Weather Service and is current only through 2008. You have probably heard about several powerful and costly hurricanes in the United States. With a partner, find data to update the table with more recent statistics.

1. Create a list of the years from 2008 to the last complete hurricane season (hurricane season begins in June and ends in November, so if you are working on this project before the end of November, do not include the current year in your list).
2. Split the years with your partner so you each have half of them to research.
3. Using Web search tools or other research tools, try to locate a summary of hurricane damage for each year.
4. Open the **Revised Historical Hurricanes** file from your solution files, and save the document as **TP 15–1**, followed by your initials.
5. If any of the years you research total more dollar damage than the hurricanes already listed in the Revised Hurricane History table, insert new rows to add the data you have found.
6. When you have compiled the data, experiment with sorting the rows using different criteria and applying different formats to the header row, borders, cells, and text.
7. With your partner, decide which format presents the data the way you prefer, and then add your names and the current date to the bottom of the document page.
8. Save the changes to the document, and then close the document.

CRITICAL THINKING

CRITICAL THINKING 15–1

IC3 2-2.1.1

The owner of the stable where you ride horses has been complaining about the comings and goings of her part-time staff and unpaid helpers (of whom you are one). She would like a way to keep track of names, phone numbers, what days and hours each helper is scheduled, and their hourly pay (if any).

1. Create a new Word document, and save the document as **CT 15–1**, followed by your initials.
2. Use what you have learned in this lesson to create a table layout and design that will help the stable owner organize the information about her staff. Enter several fictitious entries in the table (including yourself) to test your solution.
3. Save the changes to the document, and then close the document.

CRITICAL THINKING 15–2

IC3 2-2.1.1

In this lesson you learned that the Draw Table and Eraser tools are useful for creating complex table grids. Explore textbooks, journals, magazines, and newspapers to find examples of custom table layouts used to present data. Share these samples with your class, and discuss how drawing a table grid is useful for creating table layouts.

ONLINE DISCOVERY

In this lesson, you learned to use tables to organize data in Word. Did you realize that tables are also used to organize Web page content? Open several different Web pages, and identify the table grid used for organizing the content on each page. Be sure to include all Web page elements, such as the Web page title at the top and the menu of links that often appear at the left. You will see that sometimes table border lines are used to enhance the appearance of the page, but in many cases, the table structure is not obvious in the Web page design. (*Hint:* Sometimes selecting all the content on the Web page will help identify the table structure.)

IC3 2-2.1.1

JOB SKILLS

If you have ever created a resume, you know how difficult it can be to fit all your work history, educational information, and accomplishments on one page in an appealing format. Have you ever considered using a table grid to organize your information?

1. Create a new Word document, and save the document as **JS 15–1**, followed by your initials.
2. Write a brief paragraph explaining how using a table grid can help you organize the pertinent data for a resumé.
3. Save the changes to the document, and then close the document.

IC3 2-2.1.1

EXPLORE AND SOLVE

If your table has a lot of data, or if the table is positioned at the bottom of a page, the table rows can span to a new page. When the table rows span to the next page, it is difficult to identify the data in each of the columns. Search the Table Tools features to find a way to automatically reference the column data when the table spans to another page.

1. Open the file **Season Scores** document from the drive and folder where your Data Files folder is stored. Save the Season Scores document as **ES 15–1**, followed by your initials.
2. Apply a format that will automatically reference the column data when the table wraps to the next page.
3. Save the changes to the document, and then close the document.

IC3 2-1.1.8 2-1.1.9 2-2.1.1



Estimated Time:
1.5 hours

LESSON 16

Enhancing Documents

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Create a new document based on a document template.
- Apply and modify styles and create new styles.
- Use built-in building blocks for frequently used text and document parts.
- Insert fields to display the date and time.
- Insert footnotes and endnotes.
- Create and edit hyperlinks.
- Insert symbols and special characters.
- Create custom building blocks.

DATA FILES

To complete this lesson, you will need these data files:

Events.docx
Fax Template.dotm
Heritage.docx
Itinerary Letter Template.dotm
Lease.docx
McAndrew.docx
Refund Letter Template.dotm
Store Debate.docx

WORDS TO KNOW

blog
boilerplate text
building blocks
character styles
document template
endnotes
fields
footer
footnotes
global template
header
linked styles
Normal template (Normal.dotm)
paragraph styles
placeholder text
style
template

Microsoft product screenshots used with permission from Microsoft Corporation.

When developing a document, you must keep in mind its purpose and the needs of the reader. By using appropriate design elements, you can publish a professional-looking, effective document. Word provides a number of features to help you easily apply formats to enhance the appearance of the document.

Working with Document Templates

VOCABULARY

template

document template

global template

Normal template

boilerplate text

fields

placeholder text

Every Microsoft Word document is based on a ***template***, a file that affects the basic structure of a document and contains document settings such as fonts, line spacing, margins, and page layout. Using templates increases the speed and efficiency of your work since you do not need to spend time formatting page layouts and font formats. Templates also help you maintain consistency in the documents you create.

Word has two types of templates. A ***document template*** contains document settings, content, and formats that are available only to documents based on that template. A ***global template*** contains document settings that are available to all documents.

Word's default global template, the ***Normal template***, is the file Normal.dotm. When you open a new blank document, by default the Normal template provides predefined formats that are already part of the document, such as default settings that affect the page layout, margin settings, paragraph spacing, and font styles. Of course, as you work with a document you often change those default settings.

QUICK TIP

To run Word, you must have a Normal template. If the Normal template is deleted, Word will create a new one using the factory defaults.

Create a New Document Based on a Document Template

Creating documents such as fax cover sheets, resumes, and invoices can be time-consuming tasks. Fortunately, Word has predesigned document templates for almost any purpose you can imagine. The document templates available are based on whether or not you have an Internet connection. Some of the document templates are already installed on your computer and thousands more are available at the Microsoft Web site Office.com.

Document templates are formatted for a specific purpose, and many of them already contain ***boilerplate text***, content that you frequently use in a document for that purpose. For example, if you want to create a letter, you can select a letter document template and create a new document based on that template. When the new document opens, the letter layout is already created, and the document contains boilerplate text such as the sender's company name and address. You can edit the boilerplate text, or you can replace it or delete it.

Document templates often include ***fields*** that indicate a location in the document to enter variable data such as the date. ***Placeholder text*** is displayed in the field and provides guidance for adding text or data to the field. When you click the placeholder text, all the placeholder text is selected, and as you type, the text or data you enter replaces the placeholder text. The field includes codes that automatically format the text or data you enter. Some fields provide a list arrow, and when you click the arrow you can select field content from a predefined list. If you choose not to enter text or data into a field, you can delete the placeholder text so it no longer appears in the document.

Depending on the fields used in the document template, your name or initials may automatically be added to the document. If your name or initials are incorrect, you can enter new text. You can easily save a document as a new document template, and you can create a new document based on an existing document.

QUICK TIP

The user name or initials automatically added to a document template are set in Word Options. To change these settings, click the FILE tab, click Options, and then if necessary, in the left pane click General. If you are using a classroom computer, do not change the Word Options settings without permission.

Step-by-Step 16.1

1. Start Word. Thumbnails for several templates, similar to those shown in **Figure 16–1**, are displayed in the Templates gallery. The templates available in your Template gallery may differ.

IC3 2-1.3.3

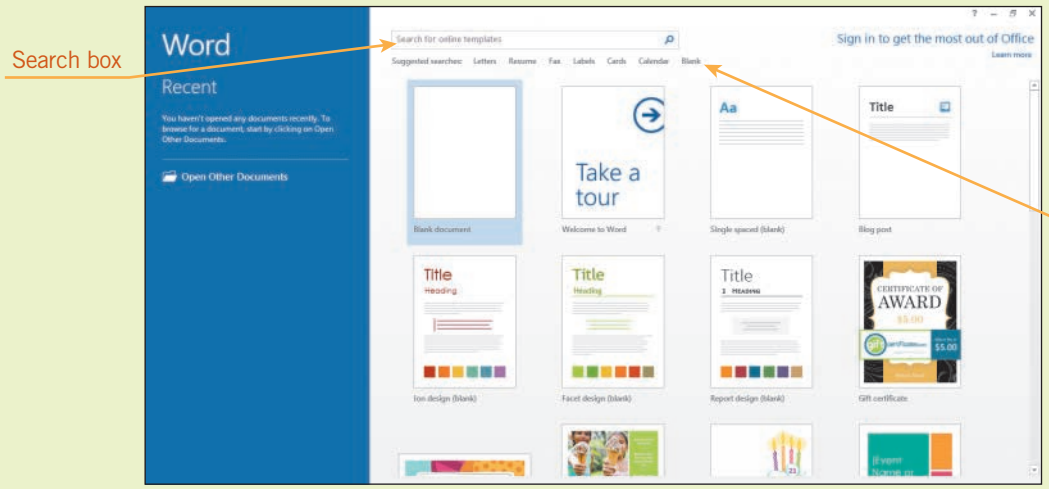


FIGURE 16–1
Thumbnails for available document templates

2. Scroll down through the gallery to preview the variety of document templates available. To access more templates available online, you would search for key words or click a link for frequently-used categories under the Search box at the top of the Templates gallery.
3. Normally, you would click a thumbnail in the Templates gallery and then click Create to create a new document based on the document template. Instead of using a document template in the Word Template gallery, you will create a new document based on a document template from your Data Files. In the Navigation pane, click **Open Other Documents** and then navigate to the drive and folder where your Data Files folder is stored. Open the **Itinerary Letter Template.dotm** file.

ABOVE AND BEYOND

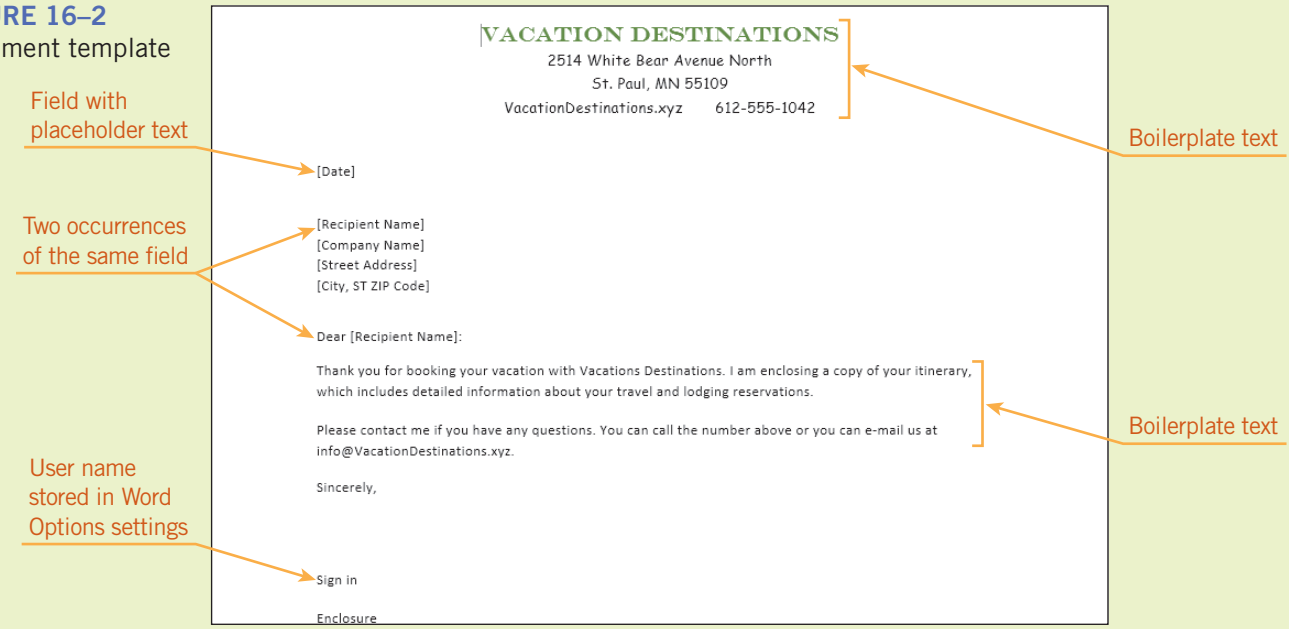
To access some of the templates, you must purchase and download the Docstock app for Office before you can access the template and edit the content. Also, some of the available templates include a Gift Pass price tag. When you create a new document based on these templates, you can add a Gift Pass to your document and then send the Gift Pass directly from your computer. Then the recipient of the document can go to the redemption Web site, enter their Gift Pass number, and choose a gift card from over 200 nationwide merchants.

QUICK TIP

When you open a document template using the File Explorer (instead of using the Word Open command), the file will automatically open in .docx format; and then when you save the edited document, the file type setting will be .docx.

4. Compare your screen to **Figure 16–2**. Note that the document template displays fields, placeholder text, and boilerplate text. The Recipient Name field appears twice in the document. The Signature field at the bottom of the letter may display the user name stored in the Word Options settings.

FIGURE 16–2
Document template



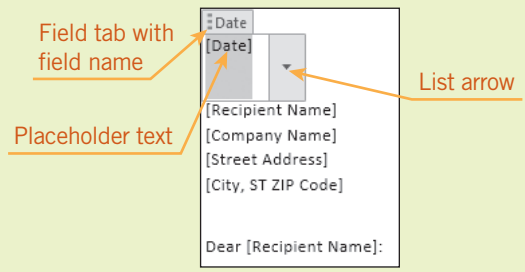
ABOVE AND BEYOND

When you save the template file in the My templates folder, you can access the template in the Template gallery when you click New in Backstage view.

5. Click the **FILE** tab, click **Save As**, and then navigate to the folder where your solution files are stored. In the File name box, type **Revised Itinerary Letter**, followed by your initials. If necessary, click the **Save as type** list arrow, select **Word Document (*.docx)**. Click **Save**. The file is saved as a new document without making any changes to the document template. When you create a new document based on a document template in the Template gallery, Word automatically changes the file type when you save the new document.

6. Under the company letterhead, click the **Date** placeholder text (the placeholder text is enclosed in brackets). When the field is selected, a field tab appears with the field name, as shown in **Figure 16–3**. This placeholder also displays a list arrow.

FIGURE 16–3
Selected field with list arrow



7. Click the placeholder list arrow to display a calendar similar to the one shown in **Figure 16–4**. Below the calendar click **Today**. The current date is displayed in the field in a predefined format, and every time you open the document the date will be updated.

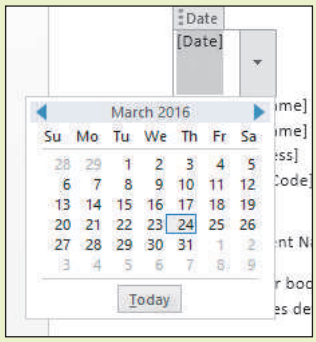


FIGURE 16–4
Field with date options

8. In the address block, click the **Recipient Name** placeholder text and type **Alexander Cruz**. Click anywhere in the document window to deselect the field. Note that the recipient's name *Alexander Cruz* now also appears in the salutation because once you enter data in a field, the data appears in all occurrences of the field. Also note that the colon still appears after the recipient's name.
9. Click the **Company Name** placeholder text to select it. Only the field name displays because of the text in the line below. Press **Delete** to delete the selected field, then press **Delete** again to remove the blank line under the recipient name.
10. Click the **Street Address** placeholder text and type **1893 St. Clair Avenue**.
11. Click the **City, ST ZIP Code** placeholder text and type **Saint Paul, MN 55105**.
12. Edit the boilerplate text. In the second sentence in the body of the letter, position the insertion point in front of the word *itinerary* and type **revised** and then press the **spacebar**.
13. Save the changes. All changes you made were saved to the new document you created, and the document template remains unchanged.
14. Close the document and leave Word open for the next Step-by-Step.

WARNING

At any time when you exit Word, if prompted to save changes to the Normal.dotm template, click Don't Save.

Using a Document Template to Create a Blog

VOCABULARY
blog

A ***blog*** (an abbreviated version of the term "Web log") is a journal maintained by an individual or a group and posted on a Web site for public viewing and comment. Blogs are often referred to as online diaries, and they may include graphics, photos, music, and video. A typical blog Web site provides links to other Web sites and enables instant feedback or commenting, and many blog hosts offer free blog posting services. The Blog post template provides the necessary file formats so the blog entry content can be published on the Web. The advantage to posting the blog from a Word document is that you can use Word's photo-editing tools, font formats, and spelling checker.

Completing the process of posting a blog is beyond the scope of this lesson because to post a blog from Word you must have an established and registered blog account with a Microsoft-enabled blog service provider. The following Step-by-Step provides information for those who are using the Blog Post feature for the first time and need to register a blog account. Once the registration is completed, you can use the Publish Blog Post command to post entries directly from a Word document.

Step-by-Step 16.2

IC3 2-1.3.3

1. Click the **FILE** tab, and then click **New**. In the Templates gallery, click the **Blog post** thumbnail, and then click the **Create** button.
2. If you have never registered a blog account, the dialog box shown in **Figure 16–5** will appear. Click **Register Later**. The Ribbon adapts and shows the BLOG POST tab as shown in **Figure 16–6**.

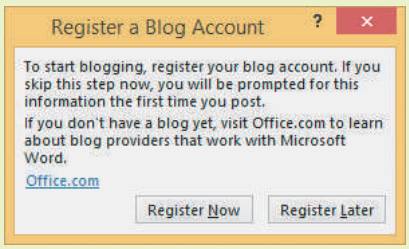


FIGURE 16–5
Register a Blog Account dialog box

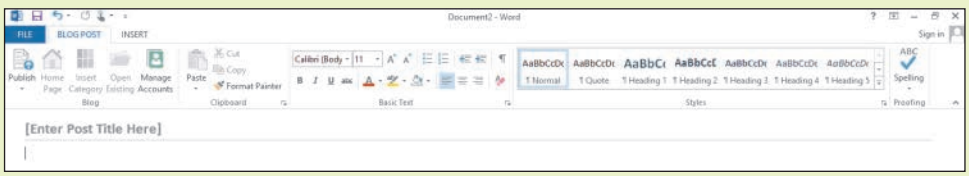


FIGURE 16–6
BLOG POST tab on the Ribbon

3. Below the Ribbon, click the **Enter Post Title Here** placeholder text and then type **Holiday Break!**.
4. Click in the area below the new blog title you entered. Then type **Today is my last day of classes before the holiday break. Yeah!**.
5. In the Blog group, click the **Publish** button. If you are not registered for a blog account, the Register a Blog Account dialog box will open again.

6. Click **Register an Account**. The New Blog Account dialog box shown in **Figure 16–7** opens.

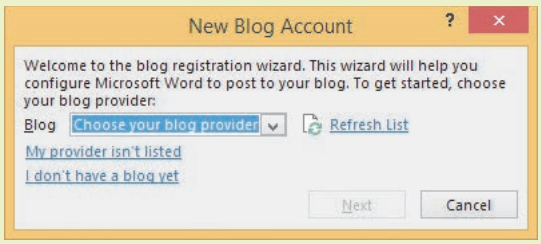


FIGURE 16–7
New Blog Account dialog box

7. Click the **Blog** list arrow to show the blog provider options as shown in **Figure 16–8**.

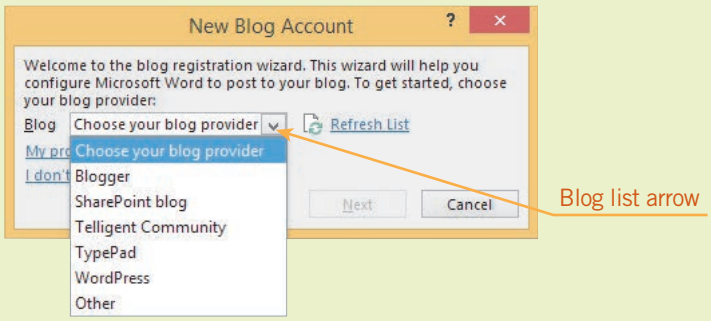


FIGURE 16–8
List of blog providers

8. Select any one of the providers in the list, and then click **Next**. A new dialog box similar to the one shown in **Figure 16–9** opens.

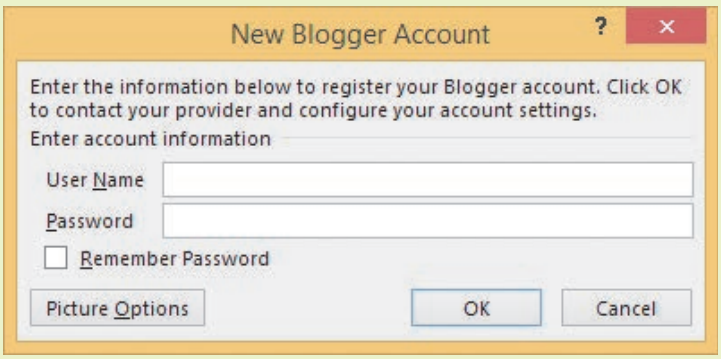


FIGURE 16–9
Dialog box for entering new blog account details

9. If you have a blog account, you could enter the required information and click OK. Word would then connect to the blog account and a message would be displayed confirming the connection was successful. Click **Cancel**. A notification indicates that Word cannot publish this post. Click **OK**.
10. Close the Blog Post document window without saving the changes.

Working with Styles

VOCABULARY
style
character styles
paragraph styles
linked styles

Another way to quickly and easily change the appearance of document elements is to apply a style. A ***style*** is a set of formatting characteristics you can apply to characters, paragraphs, tables, and numbered and bulleted lists. When you apply a style, you apply a whole group of formats in one simple step. For example, instead of taking multiple steps to format your title as Arial, 14 point, bold, and center-aligned, you can achieve the same result in one step by applying a title style.

Using styles ensures consistency across multiple documents. Another advantage to formatting your document using styles is that when text is formatted with Word's built-in heading styles you can view, organize, and edit the document content in Outline view.

Applying Styles and Modifying Style Formats

Styles are included in templates. When a template is attached to the document, you can access all the styles saved in the template. The Normal template contains a set of predefined styles that you can quickly access from the Quick Style gallery in the Styles group on the HOME tab. You can apply these styles and modify them. The style changes are applied only to the current document.

The styles provided in the Normal template include character, paragraph, and linked styles. *The **character styles*** provide text formats such as font name, font size, font color, bold, italic, underline, borders, and shading. The ***paragraph styles*** provide both text formats and paragraph formats such as line spacing, text alignment, indentation, and tab stops. ***Linked styles*** provide either text or paragraph formats, depending on the content that is selected when the style is applied. For example, when you select a word or phrase and then apply a linked style, just the text formats of the style are applied. On the other hand, when you click in a paragraph or select an entire paragraph and then apply a linked style, both the text and paragraph formats are applied.

Step-by-Step 16.3

IC3
2-1.2.1
2-1.3.6

1. Open the **Store Debate** file from the drive and folder where your Data Files folder is stored. Save the Store Debate document as **Revised Store Debate 1**, followed by your initials.
2. Make sure the insertion point is positioned at the top of the document in the title *National Chain Store or Local Store?*. In the Styles group on the HOME tab, hover the mouse pointer over the *Heading 1* style (see **Figure 16–10**). You can see the Live Preview of the style formats in the document window. Note that in the Live Preview both character and paragraph formats are applied.

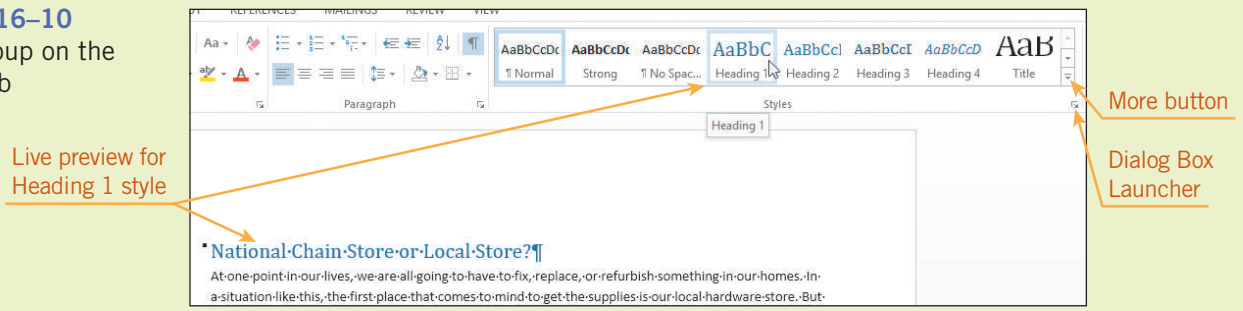


FIGURE 16–10
Styles group on the HOME tab

3. In the Styles group, click the **More** button to show all the available styles in the Quick Style gallery as shown in **Figure 16–11**. Click the **Title** style. The style is a paragraph style so it is applied to all the text in the paragraph where the insertion point is positioned. The font style, font size, font color, and text alignment are modified. On the Ribbon, the Title style is selected in the Styles group, indicating that the style is applied.



FIGURE 16–11
Quick Style gallery

4. To modify the style, in the Paragraph group on the HOME tab, click the **Center** button. The modification to the style is not permanent; the style change will only apply to this occurrence in this document.
5. In the Styles group, click the **dialog box launcher** to open the Styles pane shown in **Figure 16–12**. If desired, enable the **Show Preview** option to see the previews of the Styles pane. Paragraph styles are marked with a ¶ symbol. Character styles are marked with the character a. Linked styles are marked with ¶a. The styles listed in the Styles pane are the same as the styles available in the Styles group on the HOME tab.

QUICK TIP

If your Styles pane does not match the pane shown in Figure 16–12, at the bottom of the pane, click Options. In the Style Pane Options dialog box, make sure the Select styles to show box displays the setting Recommended.

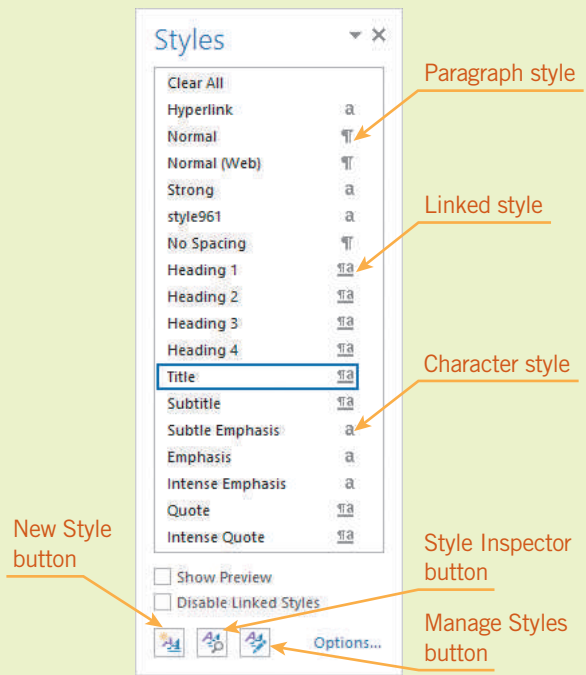


FIGURE 16–12
Styles pane

6. If necessary, drag the Styles pane to reposition it so you can use the vertical scroll bar in the document window. In the heading *Background Information*, position the insertion point in the first word **Background**. In the Styles pane, click the **Intense Emphasis** style, which is a character style. The character formats are applied to the current word, but no paragraph formats are applied. At the top of the Styles pane, click **Clear All** to remove all styles from the current word.
7. With the insertion point still positioned within the *Background Information* heading, apply the **Heading 1** style. The style is a linked style so both character and paragraph formats are applied.
8. Apply the **Heading 2** style to the remaining headings in the document: *Differences, Similarities,* and *Conclusion*. Then in the upper-right corner of the Styles pane, click the **Close** button to close the pane.
9. Position the insertion point at the beginning of the document. Click the **VIEW** tab, and then in the Views group click the **Outline** button. The document is displayed in Outline view, and the Ribbon adapts and displays the OUTLINING tab shown in **Figure 16–13**.

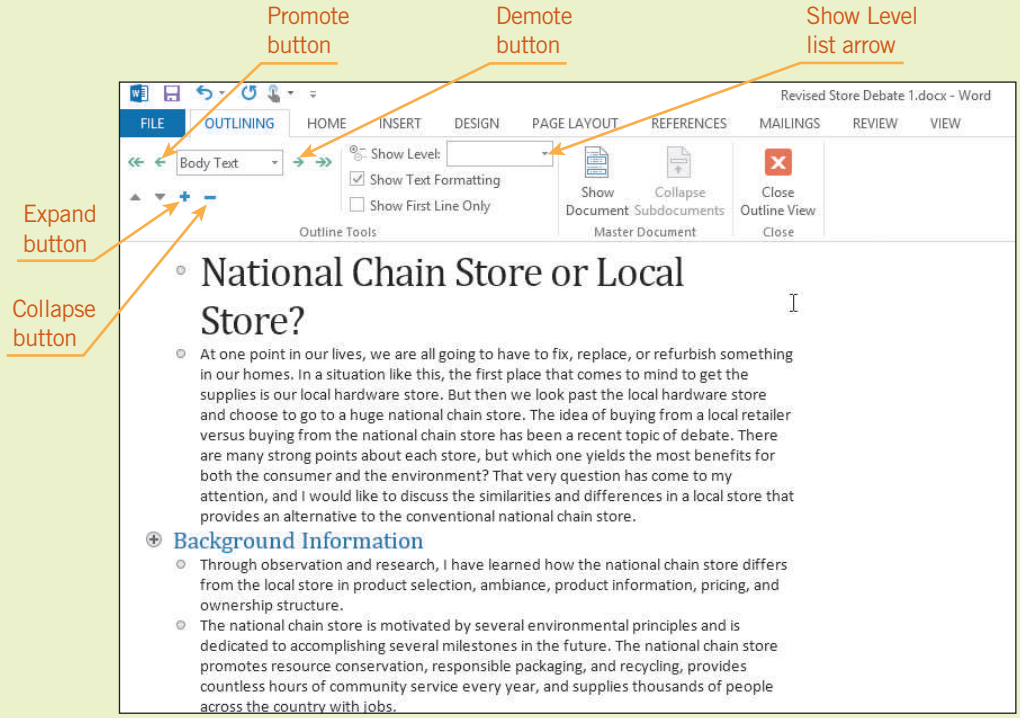


FIGURE 16–13
OUTLINING tab and document content in Outline view

10. On the OUTLINING tab, in the Outline Tools group, click the **Show Level** list arrow, and then click **Level 2**. All the body text is hidden, and all you see is the text formatted for Level 1 and Level 2 headings as shown in **Figure 16–14**. To show all the body text, click the **Show Level** list arrow, and then click **All Levels**.

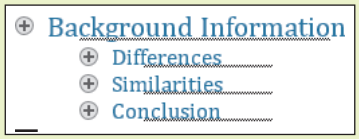


FIGURE 16–14
Level 1 and 2 headings with collapsed body text in Outline view

11. Scroll down and triple-click the Level 2 heading **Differences** to select the entire section. In the Outline Tools group, click the **Collapse** button. The selected body text is hidden. Drag and drop the heading so it is positioned before the heading *Conclusion*. In the Outline Tools group, click the **Expand** button to show the body text. When the headings are rearranged, the body text moves with the heading.
12. Click anywhere in the Level 2 heading **Similarities**. On the OUTLINING tab, in the Outline Tools group, click the **Demote** button to demote the heading to a lower level (in this case Level 3).
13. Click the **Promote** button twice to change the format to a Level 1 heading. Promote the headings *Differences* and *Conclusion* to Level 1. In the Close group, click the **Close Outline View** button.
14. Save the changes, and leave the document open for the next Step-by-Step.

Creating Styles

You can create new styles based on existing styles and formatted text. You can also create new styles using formatting commands or basing the new style on an existing style. After creating a new style, you can add the style to the Quick Style gallery so the style can be accessed on the Ribbon. After creating a new style, you can easily modify the style properties and formats.

You can save modified and new styles to a template so you can access the styles again in the future. Because you most likely share your computer with classmates, in this lesson you will save styles only in the current document.

Step-by-Step 16.4



IC3
2-1.1.7
2-1.2.1

1. If necessary, open the **Revised Store Debate 1** file from your solution files. Save the Revised Store Debate 1 document as **Revised Store Debate 2**, followed by your initials. Show the **Styles** pane.
2. Select the Level 1 heading **Background Information**. Apply an underline format. To save the modified style for future use, in the Styles group, click the **More** button, and then click **Create a Style**. The Create New Style from Formatting dialog box opens.

3. In the Name box, type **My Heading 1**, followed by your initials, and then click **OK**. The new style is added to the Quick Style gallery, and it is displayed in the Styles group on the Ribbon and in the Styles pane.
4. Select the heading **Similarities**. Apply the **Italic** format, and change the font size to **20** point.
5. At the bottom of the Styles pane, hover the mouse pointer over the buttons to show the ScreenTips, and then click the **New Style** button. Another Create New Style from Formatting dialog box opens. Enter the property settings for the new style:
   a. In the Name box, replace Style1 with **My Heading 2**, followed by your initials.
   b. Leave the *Style type* and *Style based on* settings as is.
   c. Make sure the options **Add to the Styles gallery** and **Only in this document** are enabled.
   d. When your settings match those shown in **Figure 16–15**, click **OK** to save the new style and close the dialog box.

QUICK TIP

To remove a style from the Quick Style gallery, right-click the style thumbnail in the Styles group on the HOME tab (or in the Styles pane), and then click Remove from Style Gallery.

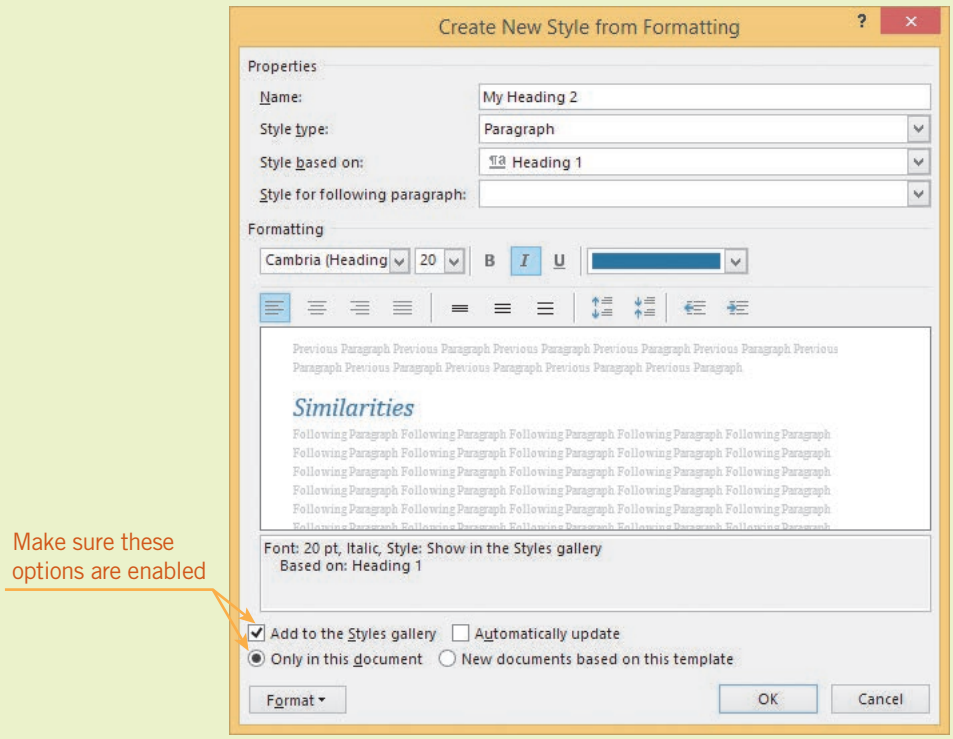


FIGURE 16–15
Create New Style from Formatting dialog box

6. In the Styles group, click the **More** button, and then click **Apply Styles** to open the Apply Styles pane, shown in **Figure 16–16**. The current style, My Heading 2, is displayed in the *Style Name* box. Leave the Apply Styles pane open.

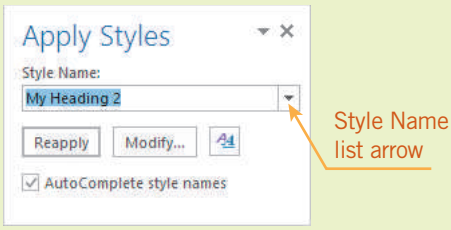


FIGURE 16–16
Apply Styles pane

7. Scroll down in the document, and click anywhere in the *Differences* heading. In the Apply Styles pane, the current style *Heading 1* is displayed. Click the **Style Name** list arrow, and then click **My Heading 2**. The new style is applied to the current text.
8. Scroll down to the last heading in the document, *Conclusion*, and apply the **My Heading 2** style. Then scroll to the top of the document and apply the **My Heading 2** style to the heading *Background Information*. Then in the upper-right corner of the Apply Styles pane, click the **Close** button to close the pane.
9. At the top of the document, select the title **National Chain Store or Local Store?**. In the Styles pane, click the **New Style** button. Enter the property settings for the new style:
   a. In the Name box, replace *Style1* with **My Title**, followed by your initials.
   b. Click the **list arrow** for the *Style for the following paragraph* box, and select **Normal**. The Normal character and paragraph formats are applied to the paragraph immediately following the paragraphs with this style.
   c. In the lower-left corner of the dialog box, make sure the options **Add to the Styles gallery** and **Only in this document** are enabled.
10. To define the character formats for the new style:
    a. In the lower-left corner of the dialog box, click **Format**, and then click **Font** to open the Font dialog box. If necessary, click the **Font** tab in the dialog box.
    b. Change the font to **Calibri**, and then change the font style to **Bold Italic**.
    c. Under *Effects*, enable the **Small caps** option.
    d. Click **OK** to close the Font dialog box.
11. To define the paragraph formats for the new style:
    a. Click **Format**, and then click **Paragraph** to open the Paragraph dialog box. If necessary, click the **Indents and Spacing** tab in the dialog box.
    b. Under *Spacing*, change the *Before* setting to **10** and the *After* setting to **10**.
    c. Click **OK** twice to close both dialog boxes.
12. In the Styles pane, point to the *My Title* style, then click the **My Title** style list arrow. Click **Modify** to open the Modify Style dialog box.

13. In the Name box, change the style name to **My Report Title**, followed by your initials. Click **OK**. The new style name is displayed in the Styles pane and in the Styles group, and the text in the document reflects the change in the style format. Close the Styles pane.
14. Save the changes, and leave the document open for the next Step-by-Step.

Using Building Blocks and Data Elements

VOCABULARY
building blocks
header
footer

Building blocks are built-in document parts that are already designed and formatted, enabling you to quickly create a professional-looking document. Word provides several built-in building blocks for frequently used text and document parts, such as predesigned cover pages, headers, footers, and page number formats. Not only do building blocks save you time, but they also ensure consistency in content and formats. The built-in building blocks are stored in the Quick Parts gallery, and you can add your own custom building blocks to the gallery. After inserting building blocks in a document, you can customize the text or document parts.

Creating an effective, professional document also often requires inserting special data elements such as footnotes or endnotes, dates and times, hyperlinks, and copyright and trademark symbols. Word provides quick access to tools that simplify the tasks for adding these elements.

Inserting Page Numbers and Creating Headers and Footers

Page numbers are always helpful when your document has multiple pages. When you insert page numbers in a document, the page number is displayed in a header or a footer. A ***header*** is information and/or a graphic that is printed in the top margin of the page; a ***footer*** is information and/or a graphic that is printed in the bottom margin of the page. Your document can have a header, a footer, both, or neither. The advantage of formatting a header or footer rather than just inserting page numbers is that you can include text with the page number.

Step-by-Step 16.5

IC3
2-1.2.1
2-2.2.1

1. If necessary, open the **Revised Store Debate 2** file from your solution files. Save the Revised Store Debate 2 document as **Revised Store Debate 3**, followed by your initials. If necessary, position the insertion point anywhere on the first page of the document.
2. Click the **INSERT** tab. In the Header & Footer group, shown in **Figure 16–17**, click the **Page Number** button, and then in the submenu click **Format Page Numbers**. The Page Number Format dialog box opens.

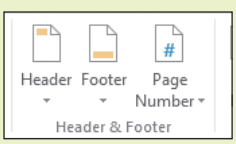


FIGURE 16–17
Header & Footer group on the INSERT tab

3. If necessary, under *Page numbering*, enable the **Start at** option. Change the Start at setting to **1**. When your settings match those shown in **Figure 16–18**, click **OK** to accept the change and close the dialog box.

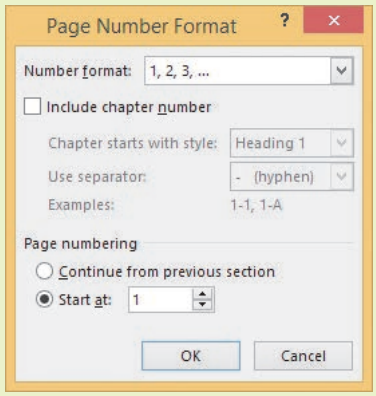


FIGURE 16–18
Page Number Format dialog box

4. Click the **Page Number** button again, and then click **Bottom of Page**. In the submenu, scroll down through the list to view the available styles. Under the *Page X of Y* category, click the **Bold Numbers 3** page number style. The document window is updated and shows a footer pane at the bottom of the first page with *Page* **1** *of* **2** aligned at the right margin. Scroll down to the bottom of the second page. No page numbers display in the footer pane.
5. Because the insertion point is positioned in front of the page number in the footer pane, the document text is dimmed, and the Ribbon adapts and displays the HEADER & FOOTER TOOLS DESIGN tab shown in **Figure 16–19**. In the Options group, disable the option **Different First Page**.

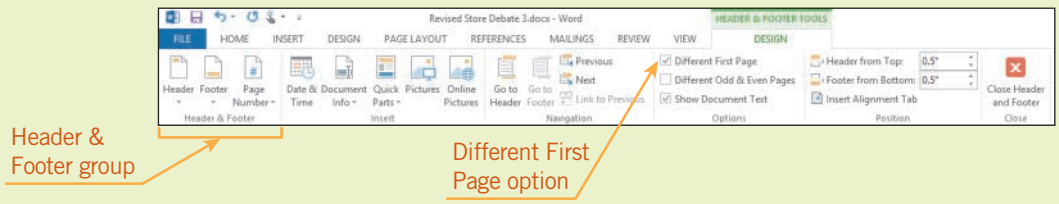


FIGURE 16–19
Header & Footer group on the HEADER & FOOTER TOOLS DESIGN tab

6. In the Header & Footer group, click the **Page Number** button, click **Bottom of Page**, and then scroll down and click the **Bold Numbers 3** page number style again. Scroll to the bottom of both pages. Now the page numbers display in the footer pane on both pages.
7. Scroll to the top of the second page, and click anywhere inside the header pane. In the Header & Footer group, on the left side of the Ribbon, click the **Header** button. If necessary, in the submenu, scroll down, and then click the **Banded** header style. A preformatted header with a field and blue fill is inserted in the header pane.

8. Click the placeholder text **[DOCUMENT TITLE]**. A tag labeled *Title* is displayed at the upper-left corner of the selected field. Type **National Chain Store or Local Store?**. Then click anywhere in the white space in the header pane to deselect the field contents.
9. In the Options group, enable the **Different First Page** check box. Double-click anywhere in the document text. Scroll through the two pages. The header and footer panes are now dimmed. Because you created the header on the second page and enabled the option to display a different header on the first page, the header you just created is displayed on the second page, but not on the first page.
10. Position the insertion point at the beginning of the document. Click the **INSERT** tab, and in the Pages group at the left side of the Ribbon, click the **Cover Page** button  . In the submenu, click the **Banded** cover page style. A preformatted cover page with several data fields is inserted at the beginning of the document. The document Title field already displays the title information you inserted into the header. At the bottom of the cover page, prefilled data for an author name and/or a company name and address generated from the data in the document properties may also be displayed.
11. At the bottom of the cover page, only your name should display. Right-click the **Company Name** field, and then in the submenu click **Remove Content Control**. Then remove the **Company Address** field. If necessary, select and delete any remaining text, characters, and blank paragraphs. If the placeholder was already replaced with prefilled text, you will need to select and delete the text.
12. Click the **FILE** tab, and then click **Print**. Scroll through the pages to preview how the pages will print. There are now three pages in the document. Note that because the cover page was added at the beginning of the document, it is now the page without a header, and the header you created now displays on pages 2 and 3.
13. Press **Esc** to close Backstage view. The header on page 2 is not necessary, so to remove the header, double-click in the header pane on either page 2 or 3. The HEADER & FOOTER TOOLS DESIGN tab will display on the Ribbon. In the Header & Footer group, click the **Header** button and then in the submenu click **Remove Header**. The header is removed from both pages 2 and 3.
14. Save the changes, and leave the document open for the next Step-by-Step.

QUICK TIP

To quickly change the cover page design, position the insertion point in the current cover page, click the Cover Page button, and choose a new page design. The text you already entered in the fields is preserved and converted to the new cover page design.

Inserting the Date and Time

You can insert a field to show the current date and/or time. By default, the date and/or the time are updated whenever the document is reopened.

The AutoComplete feature can also make entering the current date easy and accurate. When you begin typing calendar terms, such as the month, the day of the week, or the current date, Word shows the complete term in a ScreenTip and you can select the proposed term in the ScreenTip to automatically complete the term.

Step-by-Step 16.6

IC3 2-1.1.7

1. If necessary, open the **Revised Store Debate 3** document from your solution files. Save the Revised Store Debate 3 document as **Revised Store Debate 4**, followed by your initials.
2. Position the insertion point at the end of the document. Press **Enter** two times, type **Posted:**, and then press the **spacebar**.
3. Click the **INSERT** tab. In the Text group, click the **Date & Time** button. The Date and Time dialog box displays the current date and time in a variety of formats. Under *Available formats*, click the date format showing the date and time, as shown in **Figure 16–20**. At the lower-right corner of the dialog box, if necessary, enable the **Update automatically** option. When your settings match those shown in Figure 16–20, click **OK**. The current date and time is entered as text in your document. Note the time that is currently displayed in the document (for example 10:45 AM).

QUICK TIP

To automatically update fields before printing, click the FILE tab, click Options, and then click Display. Under Printing options, confirm that the option Update fields before printing is enabled.

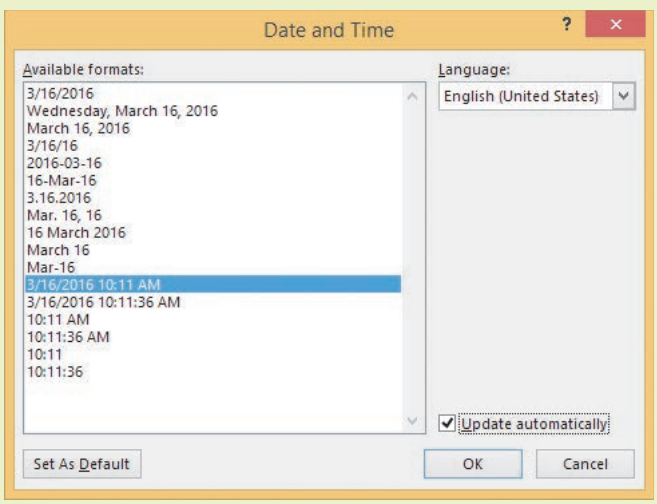


FIGURE 16–20
Date and Time dialog box

4. Save the changes, and close the document. Wait at least one minute, and then reopen the document. The time that is displayed in the document is updated.
5. Click anywhere within the date and time to show the field tag. Then double-click the three dots on the left edge of the Update tag to select the tag name and the entire field. Press **Delete**.

QUICK TIP

If the complete word is not displayed in a ScreenTip, you may need to enable the AutoComplete feature. Click the FILE tab, click Options, and then click Advanced. Under Editing options, make sure the option Show AutoComplete suggestions is enabled.

6. Type **Wedn**. After you type the letter n, the complete spelling of *Wednesday* is displayed in a ScreenTip. Press **Enter** to accept the AutoComplete entry. The full spelling of the word is inserted in the document.
7. Delete the word **Wednesday**.
8. Begin to type the current day of the week (for example, *Frid*). When the ScreenTip appears with a complete word, press **Enter**. Type a comma after the current day, and begin typing the current month, and a ScreenTip shows the full date for the Friday in the current week, such as *Friday, March 25 2016*. Press **Enter** to accept the AutoComplete entry for the full date.
9. Save the changes, and leave the document open for the next Step-by-Step.

Inserting Footnotes and Endnotes

VOCABULARY
footnotes
endnotes

Notes are most commonly seen as references in reports. However, you can also add footnotes to documents to provide additional information or comments for the reader. ***Footnotes*** are inserted at the bottom of the page on which the note is referenced in the document, and ***endnotes*** are placed together at the end of the document. Both kinds of notes are linked to an in-text reference symbol—usually a letter or numeral formatted with the superscript effect.

Step-by-Step 16.7

IC3 2-2.2.1

1. If necessary, open the **Revised Store Debate 4** file from your solution files. Save the Revised Store Debate 4 document as **Revised Store Debate 5**, followed by your initials.
2. Open the Navigation pane and search for the text **1995**.
3. With the text selected in the document window, click the **REFERENCES** tab. In the Footnotes group shown in **Figure 16–21**, click the **Insert Footnote** button AB¹. A superscript numeral *1* is inserted at the end of the selected text.

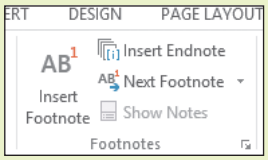


FIGURE 16–21
Footnotes group on the REFERENCES tab

4. Compare your screen to **Figure 16–22**. A divider line is created at the bottom of the page, and the insertion point is positioned next to numeral *1* below the divider line.

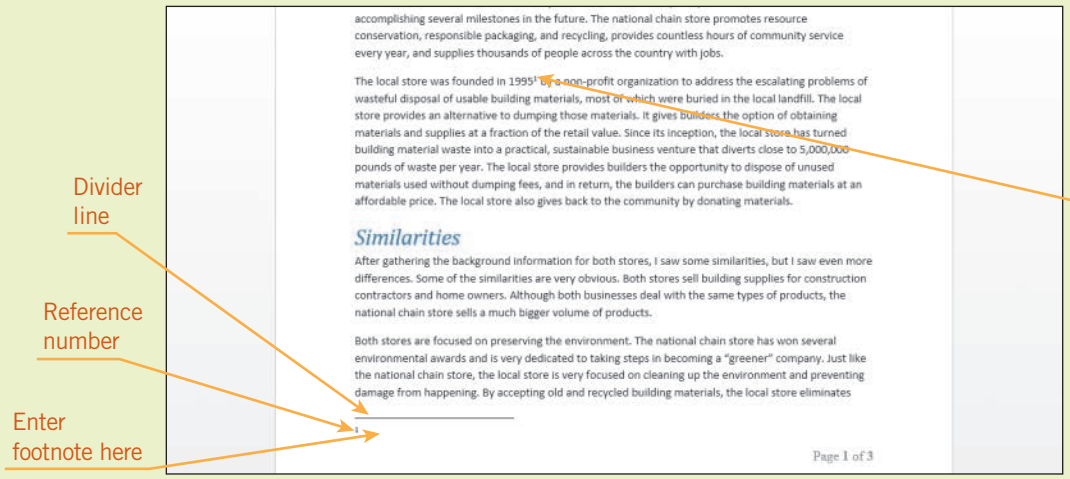


FIGURE 16–22
A footnote inserted in a document

5. Type the following note:

   The original store name was Builder's Depot.

6. Double-click the **reference number** to the left of the text you just entered. The insertion point moves to the in-text reference symbol.
7. Position the insertion point at the end of the paragraph directly above the paragraph with the new footnote reference. The paragraph ends *country with jobs*.
8. Click the **Insert Footnote** button. A new footnote reference is inserted at the location of the insertion point. Notice that the new reference is numeral *1*. Because the new footnote was inserted ahead of the existing footnote, the existing footnote was renumbered and is now referenced with numeral *2*.
9. With the insertion point positioned next to the numeral *1* at the bottom of the page, type the following note:

   The national chain store is one of the top three home improvement retailers nationwide.

10. In the Footnotes group, click the **dialog box launcher** to open the Footnote and Endnote dialog box. Under *Location*, click **Convert**. When prompted to convert all footnotes to endnotes, click **OK**, and then close the dialog box. The notes are now displayed at the bottom of the third page of the document, and the references numbers are *i* and *ii*.
11. In the endnote at the bottom of the page, double-click the number **i**. The insertion point moves to the first in-text reference symbol. Position the mouse pointer over the superscript numeral *i*. A ScreenTip will show the text that is displayed in the endnote.
12. Save the changes, close the Navigation pane, and close the document.

QUICK TIP

When footnotes are moved or deleted, Word automatically adjusts the reference numbers.

Creating and Editing Hyperlinks

A helpful tool on the INSERT tab is the Hyperlink button. Usually when you think of a hyperlink, you think about links to Web pages and e-mails. When you type URLs for Web pages and e-mail addresses, Word automatically creates a hyperlink. However, you can also create links to another location in the same document, to another Word document, or to a file in another application. To create a link to another location in the same document, the document content must be formatted with default heading styles or bookmarks.

Step-by-Step 16.8

1. Open the **McAndrew** file from the drive and folder where your Data Files folder is stored. Save the McAndrew document as **McAndrew Bio**, followed by your initials. Close the document.
2. Open the **Revised Store Debate 5** file from your solution files. Save the Revised Store Debate 5 document as **Revised Store Debate 6**, followed by your initials. Show the nonprinting characters.
3. Position the insertion point in the first paragraph below the title on page 1. (The cover page does not have a page number.) Type **By Richard McAndrew** and then press **Enter**.
4. Select the new text **Richard McAndrew**. Click the **INSERT** tab. In the Links group shown in **Figure 16–23**, click the **Hyperlink** button. The Insert Hyperlink dialog box opens.

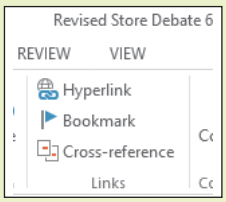


FIGURE 16–23
Links group on the INSERT tab

5. Under *Link to*, make sure that the **Existing File or Web Page** option is enabled. If necessary, in the Look in box, navigate to the folder where you save your solution files. Click the filename **McAndrew Bio**. Compare your dialog box to the one shown in **Figure 16–24**.

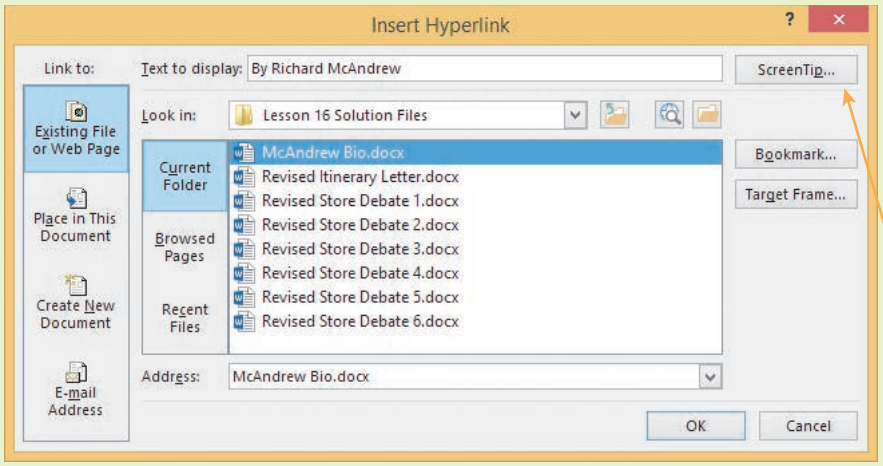


FIGURE 16–24
Insert Hyperlink dialog box

6. In the upper-right corner of the dialog box, click the **ScreenTip** button. In the Set Hyperlink ScreenTip dialog box, type **Information about the author**, and then click **OK**. Then click **OK** to close the Insert Hyperlink dialog box. A link is created to another document, and the selected text is displayed in a different color indicating the hyperlink format.
7. Hover the mouse pointer over the hyperlink text. A ScreenTip displays, showing the text you entered in the dialog box. Press and hold **Ctrl**, and click the **Richard McAndrew** hyperlink to connect to the target. The McAndrew Bio document opens.
8. Select all the text in the McAndrew Bio document, and copy the selected text to the Clipboard. Close the McAndrew Bio document. Position the insertion point at the end of the second endnote in the Revised Store Debate 6 document. Press **Enter** two times, and then type **About the Author**. Press **Enter**, and then paste the copied text from the McAndrew Bio document.
9. Select the heading **About the Author**. Click the **HOME** tab. In the Styles group, click the **More** button to open the Quick Style gallery, and then click the **Heading 3** style.
10. Navigate to the top of Page 1. Right-click the **Richard McAndrew** hyperlink, and in the shortcut menu click **Edit Hyperlink**. The Edit Hyperlink dialog box opens. In the left pane under *Link to*, click **Place in This Document**. The dialog box adapts to show the headings and bookmarks in the document. Only one heading is displayed because the other headings are formatted with custom styles instead of default heading styles. Under *Select a place in this document*, click **About the Author**, and then click **OK**.

QUICK TIP

If you do not want the hyperlink format applied to the URL or the e-mail address text, click the Undo button or press Ctrl+Z immediately after Word automatically formats the hyperlink. Or at any time, you can right-click the hyperlink text and in the shortcut menu click Remove Hyperlink.

11. Press and hold **Ctrl**, and then click the **Richard McAndrew** hyperlink to make sure the target is the *About the Author* heading at the end of the document.
12. Position the insertion point at the end of the paragraph following the *About the Author* heading. Press **Enter** to create a new paragraph, and then type the following:

    Send your feedback to news@westmorelandtimes.xyz.
13. Press **Enter**. Word automatically creates a hyperlink to the e-mail address. When you click a link to an e-mail address, Word opens an e-mail message form using your default e-mail program.
14. Save the changes, and leave the document open for the next Step-by-Step.

Inserting Symbols and Special Characters

Sometimes you need to enter special characters or symbols in your document. For example, if you are entering information about copyright, you will likely want to include the copyright symbol. However, the characters and symbols you need are not always available on the keyboard. Word provides access to several commonly used symbols and special characters on the INSERT tab.

Step-by-Step 16.9

1. If necessary, open the **Revised Store Debate 6** file from your solution files. Save the Revised Store Debate 6 document as **Revised Store Debate 7**, followed by your initials. Show the nonprinting characters.
2. Navigate to the last page of the document. Position the insertion point at the end of the heading *About the Author*. Press the **spacebar**.
3. Click the **INSERT** tab. In the Symbols group on the right side of the Ribbon, click the **Symbol** button. In the submenu, click **More Symbols** to open the Symbol dialog box similar to the one shown in **Figure 16–25**. Scroll up and down to view the rows of letters and symbols available.

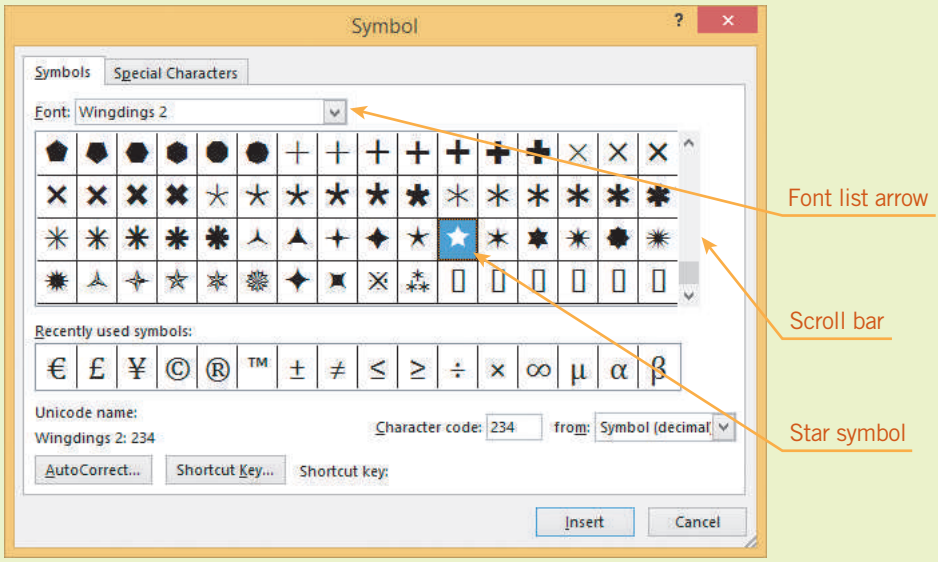


FIGURE 16–25
Wingdings 2 options in the Symbol dialog box

4. Click the **Font** list arrow, and scroll down and select **Wingdings 2**. Scroll to the bottom of the list, and select a **star** symbol as shown in Figure 16–25. Then click **Insert**. If necessary, drag the dialog box title bar to move the dialog box to the side of the screen. Note that the selected symbol is inserted at the location of the insertion point.
5. In the dialog box, click **Insert** four more times to add four more stars to the document. Leave the dialog box open.
6. Position the insertion point at the end of the hyperlink at the end of the document. Press **Enter**, and type the following, pressing **Enter** after the first line of text:

   Copyright 2016 The Westmoreland Times

   All rights reserved. This material may not be broadcast, published, rewritten, or redistributed without written permission.
7. In the document window, position the insertion point at the end of the word *Copyright*. Press the **spacebar**.

8. In the Symbols dialog box, click the **Special Characters** tab to show the special characters available. Select the **Copyright** symbol © as shown in **Figure 16–26**, and then click **Insert**.

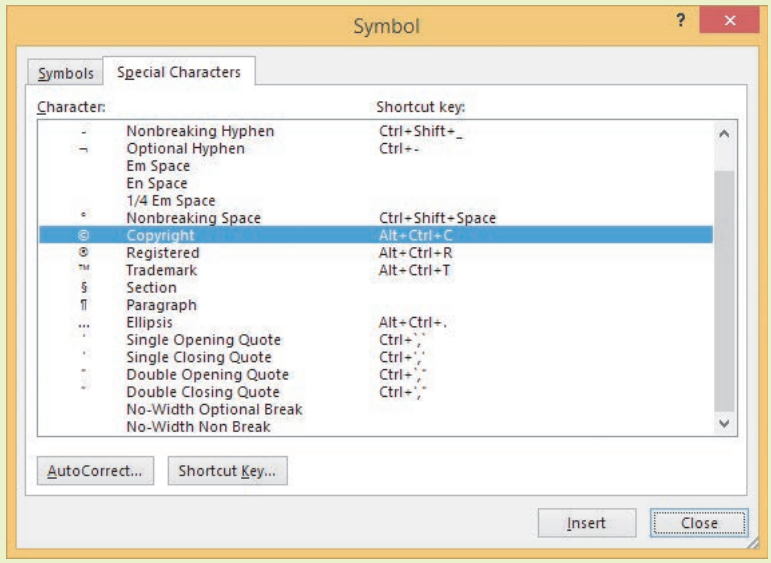


FIGURE 16–26
Special Characters tab in the Symbol dialog box

QUICK TIP

You can quickly insert the copyright symbol by typing (c). When you type the third character, Word automatically converts the text to the copyright symbol ©.

9. Close the dialog box. Save the changes, and leave the document open for the next Step-by-Step.

Creating Your Own Building Blocks

It is likely that you often enter the same content to commonly prepared documents. For example, if you often include a legal disclaimer in documents, you can select the content you want to include (text, formatted text, and/or images), and then save the selected content as a Quick Part. Not only does creating your own building blocks save you time, it also ensures consistency and accuracy.

By default, custom Quick Parts are stored in a special template named Building Blocks.dotx, where all the built-in building blocks are stored. Because you may share your computer with classmates, the Quick Parts that you create in this lesson will be removed from the Quick Part Gallery when you complete the Step-by-Step.

Step-by-Step 16.10

IC3 2-1.1.7

1. If necessary, open the **Revised Store Debate 7** file from your solution files. Save the Revised Store Debate 7 document as **Revised Store Debate 8**, followed by your initials. Show the nonprinting characters.
2. Navigate to the end of the document and position the insertion point after the posted date. Press **Enter** and type the following paragraph:

   Opinions expressed are those of the columnist and are not necessarily those of The Westmoreland Times.

3. Select the text you just typed, including the ending paragraph marker. Apply **italic** formatting and change the font size to **10** point.
4. The text should still be selected. Click the **INSERT** tab, and in the Text group shown in **Figure 16–27**, click the **Quick Parts** button, and then click **Save Selection to Quick Part Gallery**. The Create New Building Block dialog box opens.

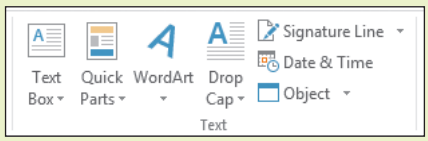


FIGURE 16–27
Text group on the INSERT tab

5. The Name box shows the first words of the selected text. Type **Disclaimer** to replace the existing text.
6. Click in the **Description** box and type **Disclaimer clause for columnist opinions**.
7. Note that the setting in the *Save in* box indicates that the building block will be stored in the default template Building Blocks.dotx. Because you included the paragraph marker in the selection in Step 3, the paragraph formatting will also be stored.
8. When your settings match those shown in **Figure 16–28**, click **OK** to accept the changes and close the dialog box. You just created a building block, and it was saved in the default template Building Blocks.dotx.

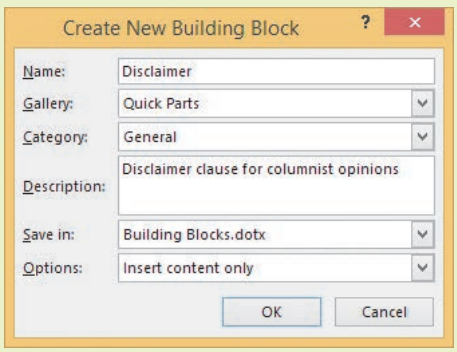


FIGURE 16–28
Create New Building Block dialog box

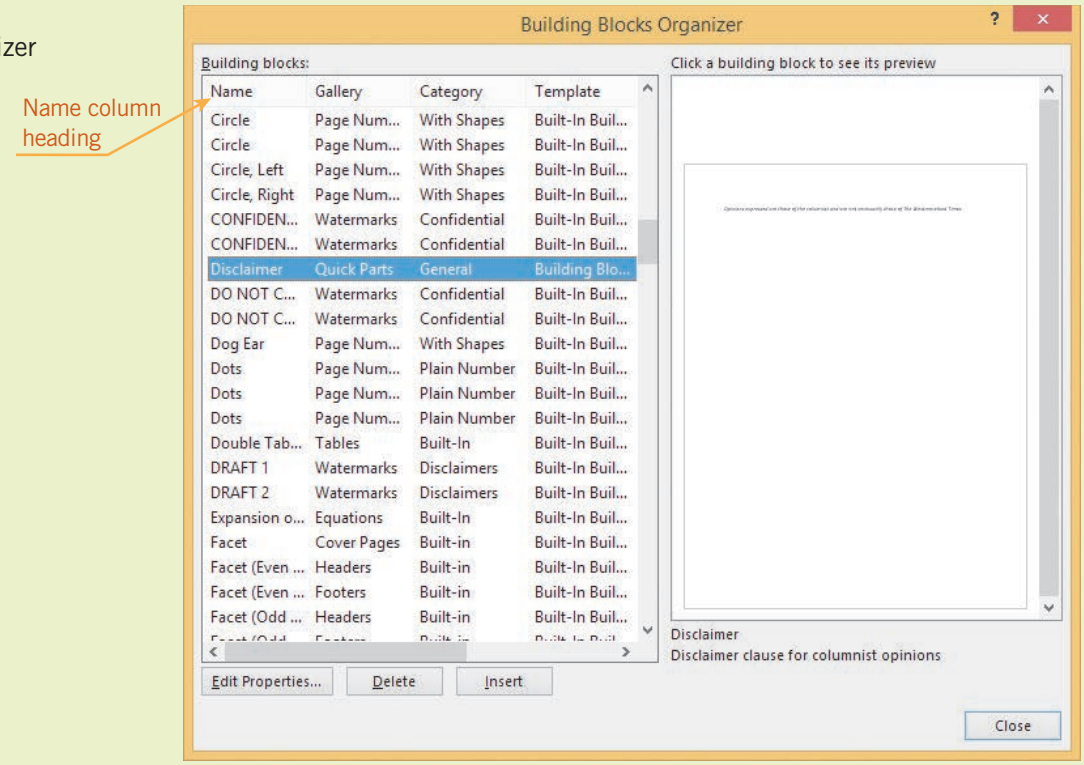
9. Deselect the text. Save the changes to the document. Then close the document, but leave the Word application open.
10. Open a new blank document. Click the **INSERT** tab. In the Text group, click the **Quick Parts** button, and then click **Building Blocks Organizer**. A dialog box opens and shows all the building blocks available.

QUICK TIP

To edit existing building blocks, insert the building block in a document. Make the necessary changes to the content, select the content, click the Quick Parts button, and then click Save Selection to Quick Part Gallery. Use the same name and gallery. When prompted to redefine the existing building block entry, click Yes.

11. Under *Building blocks*, click the **Name** column heading to organize the list in ascending alphabetical order as shown in **Figure 16–29**. Scroll down in the list to view the building block names beginning with the letter D. Click the **Disclaimer** building block. The boilerplate text is displayed in the preview pane on the right side of the dialog box.

FIGURE 16–29
Building Blocks Organizer dialog box



12. At the bottom of the dialog box, click **Insert**. The building block text is inserted in the document at the location of the insertion point.
13. Click the **Quick Parts** button, and then click **Building Blocks Organizer**. Scroll down and select the **Disclaimer** building block. At the bottom of the dialog box, click **Delete**. When prompted to confirm the deletion of the selected building block, click **Yes**. The building block is removed from the Quick Part gallery.
14. Close the dialog box and then close Word without saving the changes to the document. When you exit Word, you will be prompted to save changes to Building Blocks.dotx. Click **Don't Save**.

WARNING

When you exit a session of Word after creating or deleting a building block, or making changes to a built-in building block, you will be prompted to save the changes to Building Blocks.dotx. When working at a classroom or public computer, do not save any changes without permission.

WORKPLACE READINESS

Dress for Success

Regardless of your employment level or career path, to be effective and project a professional and competent image at work, you need to dress for success. Dressing appropriately will help you gain respect and establish credibility on the job. Every business has its own style, each position has its own status, and workers dress differently for the activities involved in their work. If your employer provides a written dress code, be sure to follow the rules. Many employers, however, do not have established dress standards, so you have to get it right on your own. If in doubt, dress like your boss, or ask a superior for advice.

SUMMARY



In this lesson, you learned:

- Word templates provide a uniform appearance for your documents and can increase the speed and quality of your work.
- You can create predesigned documents by creating a new document based on a template.
- Styles enable you to format document content consistently and efficiently.
- You can apply and modify built-in styles, and you can create new styles.
- Word provides several predesigned building blocks that enable you to create a professional-looking document quickly.
- Several tools are available to insert data elements such as the date and time.
- Word provides features that enable you to quickly format footnotes and endnotes.
- There are several options for creating hyperlinks in Word documents.
- Not all characters and symbols are available on the keyboard, so Word provides numerous symbols and special characters that you can easily insert in a document.
- You can create your own building blocks and add them to the Quick Parts gallery.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. By default, the date and time field is updated whenever the document is reopened.

T F 2. A document can have a header or a footer, but not both.

T F 3. Built-in building blocks are stored in the Templates gallery.

T F 4. You can create new styles based on existing styles and formatted text.

T F 5. Endnotes are always displayed together at the end of a document.

MULTIPLE CHOICE

Select the best response for the following statements.

1. The AutoComplete feature can help you accurately enter _____.
   A. the current day of the week
   B. the current month
   C. the current calendar date
   D. all of the above
2. You can format a _____ to create a link to another location in the same document or another Word document.
   A. linked style
   B. field
   C. hyperlink
   D. none of the above
3. A style is a set of formatting characteristics you can apply to _____.
   A. characters and paragraphs
   B. numbered and bulleted lists
   C. tables
   D. all of the above
4. _____ are frequently used text or document parts.
   A. Building blocks
   B. Data elements
   C. Fields
   D. Placeholders
5. Word's Normal template (Normal.dotm) is a _____ template.
   A. global
   B. document
   C. universal
   D. none of the above

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. A(n) _____ template contains document settings, content, and formats that are available only to documents based on that template.
2. A(n) _____ indicates a location in a document where you can enter variable data, such as an individual's name.
3. _____ is frequently used content provided in a document template.
4. A(n) _____ is information and/or a graphic that is printed in the top margin of the page.
5. A(n) _____ is a journal maintained by an individual or a group and posted on a Web site for public viewing and comment.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is the difference between a document template and a global template?

2. Why is it beneficial to use styles to format document content?

3. What are the advantages of creating a new document based on a document template?

4. What are the benefits of using building blocks?

5. What is the advantage of formatting a header or a footer rather than inserting page numbers?

PROJECTS

PROJECT 16–1

2-1.3.3

1. Open the **Refund Letter Template** file from the drive and folder where your Data Files folder is stored. Save the Refund Letter Template document as **Miller Refund Letter**, followed by your initials, using the .docx file format.
2. Complete the fields using the following information. If necessary, replace prefilled data with your first and last name.

   Date: ***Current date***
   Recipient Name: **Christopher Miller**
   Street Address: **29 Red Rock Ridge Drive**
   City, ST ZIP Code: **Youngsville, NC 27596**
3. In the first sentence in the body of the letter, replace the word *rental* with **security deposit**. Then add the following two sentences at the end of the first paragraph.

   Also enclosed is a Deposit Settlement Summary detailing the costs deducted from the original security deposit. If you feel this refund amount is in error, you can make an appeal.
4. Position the insertion point in the blank paragraph at the end of the document and then type **Enclosures**.
5. Save the changes, and close the document.

PROJECT 16–2

2-1.3.3

1. Open the **Fax Template** file from the drive and folder where your Data Files folder is stored. Save the Fax Template document as **Revised Fax Template**, followed by your initials.
2. Complete the fields using the following information. If necessary, replace prefilled data with your first and last name.

   From: ***Your name***
   Phone: **919-555-4323**
   Fax: **919-555-4325**
   Company Name: **Wellington Apartments**
3. Save the changes to the document. Make sure the document is saved as a template using the .dotm file type.
4. Save the document as **Fax Cover Page**, followed by your initials, using the .docx file format.
5. Complete the remaining fields using the following information:

   Date: ***Current date***
   To: **Jonas Baldwin**
   Phone: **919-555-8091**
   Fax: **919-555-8090**
   Company Name: Maxwell Construction

   Comments: We plan to repair and upgrade several of our units in the next few months, and we are in the process of reviewing bids. If you are interested in bidding for the projects, please respond so we can set a date and time to meet and discuss the projects.
6. At the bottom of the document, add a checkmark in the *For Review* box.
7. Save the changes and close the document.

PROJECT 16–3

2-1.1.7
2-1.2.1

1. Open the **Events** file from the drive and folder where your Data Files folder is stored. Save the Events document as **Updated Events**, followed by your initials.
2. Apply the **Title Cover** style to the title *Westmoreland Historical Society*. Change the font to **Blue, Accent 1, Darker 25%** and apply the **Bold** format.
3. Apply the **Title** style to the subtitle *Upcoming Events*. Modify the style format by centering the subtitle.
4. Apply the **Heading 1** style to the heading *The Tenth Annual Antique Fair.* Modify the style by changing the font to **Georgia**. Save the modified style as a new Quick Style. Name the new style **My New Style**. Add the custom style to the Style gallery, and make sure the style is saved only in the current document.
5. Apply the **My New Style** to the other two headings formatted with the red font.
6. Switch to Outline view. Collapse the body text under the heading *Railroad Weekend,* and then drag and drop the heading so it is at the top of the list before *The Tenth Annual Antique Fair.*
7. Expand the text, and close Outline view.
8. Save the changes, and close the document.

PROJECT 16–4

2-1.1.7

1. If you completed Project 16–3, go to Step 2. If you did not complete Project 16–3, open the **Events** file from the drive and folder where your Data Files folder is stored, and save the Upcoming Events document as **Updated Events**, followed by your initials. Then close the document.
2. Open the **Heritage** file from the drive and folder where your Data Files folder is stored, and save the Heritage document as **Revised Heritage**, followed by your initials.
3. At the end of the document, after *Date posted:,* insert a field to display the current date using the month, day, year format (for example: *March 25, 2016*). Enable the option to update automatically.
4. Select the last paragraph. Format the text with a font of your choice, and if desired, change the font size. Then create a custom style, and name the style **WHS**. Make sure the style is saved only in the current document.
5. Save the last paragraph as a building block in the Quick Part gallery. Name the building block **Westmoreland**.
6. Position the insertion point in the blank paragraph at the end of the document, and then type **www.westmorelandheritage.xyz**, and create a hyperlink for the URL.
7. In the middle of the document, select **Upcoming Events**, and then create a link to the document **Updated Events** in your solutions folder. Add the ScreenTip: **Click for info about upcoming events**.
8. Remove the custom building block *Westmoreland* from the Quick Part gallery.
9. Save the changes to the document.
10. Test the hyperlink for *Upcoming Events*.
11. Close both documents.

PROJECT 16–5

2-1.2.1
2-2.2.1

1. Open the **Lease** file from the drive and folder where your Data Files folder is stored. Save the Lease document as **Revised Lease**, followed by your initials.
2. In the first sentence, replace *XXXXX* with the current date, starting with the day, followed by the month, date, and year. (*Hint:* Use the AutoComplete feature.)
3. At the beginning of the document, create a cover page using the built-in **Ion (Light)** style. In the Year field, select today's date. In the Title field, type **Lease Agreement**. In the Subtitle field type **Bingham Property Management**. Delete the **Author** field.
4. In the first paragraph, select **Bingham Property Management**. Insert a footnote: **Bingham Property Management is a subsidiary of Living Solutions, Inc.**
5. Insert the trademark symbol (TM) after *Inc.*
6. With the insertion point positioned anywhere in the document window on the second page, insert page numbers at the bottom of the page using the **Bold Numbers 2** style.
7. Save changes, and close the document.

TEAMWORK PROJECT

2-1.1.7
2.1.3.3

Think about the types of documents you create most often. Which would serve you better—a document template or building blocks? Choose a partner to help you with this exercise.

1. Create a new Word document, and save the document as **TP 16–1**, followed by your initials.
2. Create a list of the types of documents you create most often.
3. Describe the target audience and the content for each of the documents in your list.
4. Considering the document content and the need to create professional-looking documents with consistent information, decide for each document in your list whether a document template or building blocks would serve you best. Also include information if you would create your own building block.
5. For each document in your list, describe the content and fields you could include in the document template or in the boilerplate text.
6. Save the changes to the document, and then close the document.

CRITICAL THINKING

CRITICAL THINKING 16–1

2-1.2.1
2-2.2.1

What factors do you think you should consider to create a professional-looking document that makes a good first impression?

1. Create a new Word document, and save the document as **CT 16–1**, followed by your initials.
2. Write a brief paragraph explaining what document elements (cover page, headers and footers, page numbers, date and time stamps, symbols and characters) you believe are important for making a good first impression.
3. Save the changes to the document, and then close the document.

CRITICAL THINKING 16–2

2-1.3.3

Your friend owns a sporting goods business and recently learned how to use the Word document templates.

1. Review the templates at Office.com, and create a list of the types of templates that your friend might find useful in the sporting goods business.
2. Create a new Word document, and save the document as **CT 16–2**, followed by your initials.
3. Type a list of your recommendations in a Word document.
4. Save the changes to the document, and then close the document.

ONLINE DISCOVERY

Explore Word templates available online, and preview some of the templates in Backstage view. You do not need to download any of the templates.

1. Create a new Word document, and save the document as **OD 16–1**, followed by your initials.
2. Create a list of five or more types of templates available at Office.com that you think you might use in the future for your own personal documents.

2-1.3.3

3. Save the changes to the document, and then close the document.

JOB SKILLS

1. Browse through the Office.com templates for a resume template. Remember, you can modify the styles that are in the template if you do not see a format that you like.
2. Save the document as **JS 16–1**, followed by your initials.
3. It is important to keep your resume up to date and to have a professional-looking final copy on hand. Enter your personal data in the fields, and approach this project seriously, knowing that you will someday use this resume.
4. Ask a classmate, friend, spouse, or other family member to review your completed resume. Ask them to look for errors and also to provide constructive feedback for improving the resume.



2-1.3.3

5. Make the necessary or recommended changes, and when the document is finalized, save the document. If you plan to distribute the resume electronically, save the document in XPS or PDF format to preserve the visual appearance and layout.

EXPLORE AND SOLVE

1. In this lesson you learned to insert footnotes/endnotes in a document, and the footnote reference was a number. Explore how to format a footnote reference with an asterisk or symbol instead of a number.
2. Create a new blank document and type **Author**. Select the word **Author** and insert a footnote. Format a custom mark for the footnote reference. In the footnote pane, type your first and last names, and then insert a date and time field with the current date.



2-2.2.1

3. Save the document as **ES 16–1**, followed by your initials.



Estimated Time:
1.5 hours

LESSON 17

Working with Graphics

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Format columns, borders, and shading.
- Insert clip art and pictures.
- Resize, crop, and position graphics.
- Modify graphic colors and apply styles and effects to clip art and pictures.
- Remove the background from a picture and adjust the contrast and brightness.
- Use drawing tools to create your own graphics.
- Use built-in, predesigned, and formatted layouts to create your own graphics.
- Capture a picture of the application screen.

DATA FILES

To complete this lesson, you will need these data files:

Begonias.jpg
Biker.jpg
Cycling.tif
Dog.jpg
Garden.jpg
Gardening Tips.docx
Lilies.jpg
Newsletter.docx
Roundabout Tours.docx
Sundaes Menu.docx

WORDS TO KNOW

banner
clip art
crop
desktop publishing
drawing canvas
drawing objects
graphics
manual column break
outcrop
resizing
section
section break
shape
sizing handles
SmartArt
text box
WordArt

Microsoft product screenshots used with permission from Microsoft Corporation.

Word provides a number of features to add visual interest to documents. The features help you emphasize the content and create an attractive and professional document.

Formatting Columns, Borders, and Shading

VOCABULARY
desktop publishing
section
section break
banner
manual column break

Desktop publishing is the process of creating a document using a computer to lay out text and graphics. One common example of desktop publishing is newsletters. Newsletter text is often formatted in multiple columns with headings, borders, shading, and pictures are often included. All of these enhancements make the articles more appealing and easier to read.

Formatting Text in Columns

A ***section*** is an area within a document that can have its own separate page formats such as the page orientation, margins, and the number of columns. When you create a new blank document in Word, the document consists of just one section. If you want to change the page formats for one portion of the document you must divide the document into multiple sections by creating a section break. A ***section break*** controls the section formatting of the text that precedes it. After dividing the document into multiple sections, you can apply different formats in each section.

By default, all the text you enter in a Word document will be displayed in a single column, approximately six inches wide. Formatting text to display it in multiple columns sometimes saves space on a page, and because the width of the line of text is smaller, the text is often easier to read. Word provides several multicolumn formats, and you can modify these formats to meet your needs. Oftentimes, column headings are formatted as a single-column ***banner***, which is a headline that spreads the full width of the page. When you format text in columns, the columns are usually balanced so the column heights are approximately equal. There may be occasions, however, when you want to control where text breaks from one column to the next. To adjust where a column ends, you can insert a ***manual column break***.

Step-by-Step 17.1

IC3 2-2.2.1

1. Open the **Newsletter** file from the drive and folder where your Data Files folder is stored. Save the Newsletter document as **Revised Newsletter 1**, followed by your initials. If necessary, display nonprinting characters.
2. Triple-click in the paragraph of text under the heading *BENEFITS OF OWNING A PET* to select the entire paragraph.
3. Click the **PAGE LAYOUT** tab. In the Page Setup group, shown in **Figure 17–1**, click the **Columns** button, and then in the menu click **Two**. Deselect the text.

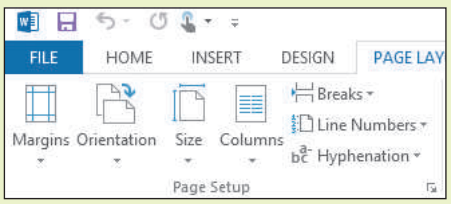


FIGURE 17–1
Page Setup group on the PAGE LAYOUT tab

4. Compare your document to **Figure 17–2**. Section breaks divide the document into three sections. The first section contains the heading BENEFITS OF OWNING A PET and is formatted for one column, the text in the second section is formatted for two columns, and the third section is formatted for one column.

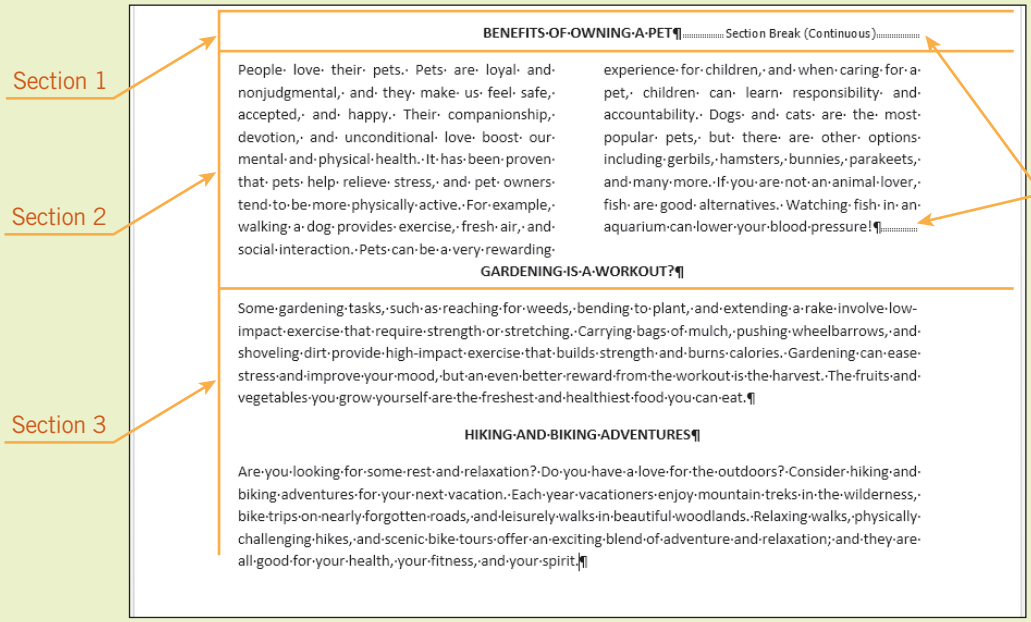
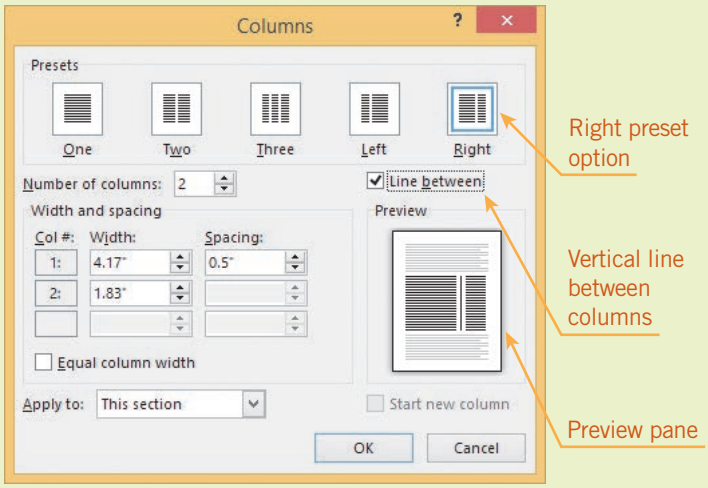


FIGURE 17–2
Document divided into three sections

5. Triple-click in the paragraph of text under the heading *GARDENING IS A WORKOUT?*. Click the **Columns** button, and then click **Three**. A new section is created, and the selected text is formatted in three columns of approximate equal width.
6. Position the insertion point at the beginning of the selected paragraph. Type **Gardening tasks provide moderate to strenuous forms of exercise**. and then press the **spacebar**. As you enter the new text, the existing text automatically wraps within the three columns.

7. Scroll down and triple-click anywhere in the paragraph of text below the heading *HIKING AND BIKING ADVENTURES*. Click the **Columns** button, and then click **More Columns**. The Columns dialog box, shown in **Figure 17–3**, opens.

FIGURE 17–3
Columns dialog box



8. Under *Presets*, click the **Right** preset option, and below that enable the option **Line between**. (The option is enabled when the box to the left of the option has a check mark.) The Preview pane in the dialog box is updated and shows the new settings.
9. When your dialog box settings match those shown in Figure 17–3, click **OK**. The text is formatted in two columns, with the wider column on the left. Since all of the text fits in the left column, no text is displayed in the narrower column on the right.
10. Deselect the text and then position the insertion point at the beginning of the fourth sentence that begins with *Each year*. In the Page Setup group, click the **Breaks** button. In the menu, under *Page Breaks*, click **Column** to create a manual column break. The text following the insertion point is moved to the column on the right. Some of the article text may wrap to a second page. A vertical line is now displayed between the two columns, and the nonprinting characters indicate a column break.
11. Position the insertion point after the paragraph symbol at the end of the three-column article. The insertion point should be flashing in front of the section break as shown in **Figure 17–4**.

QUICK TIP

To quickly insert a manual column break, position the insertion point where you want the column to break and then press Ctrl+Shift+Enter.

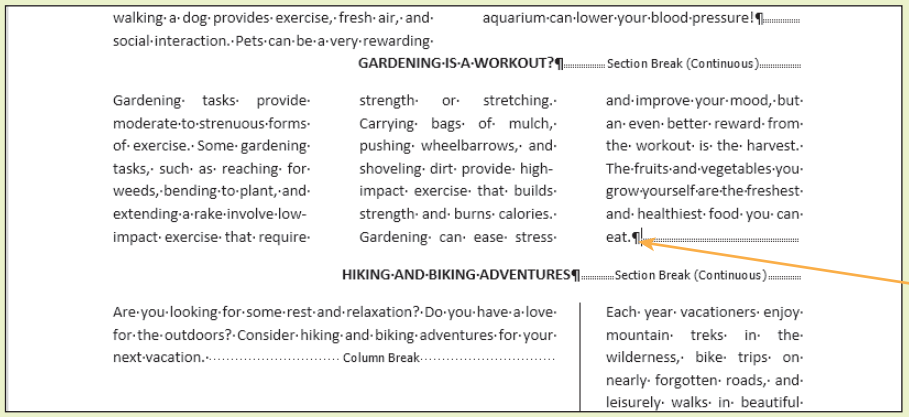


FIGURE 17–4
Insertion point positioned in front of a section break

12. Press **Delete** to remove the section break. The three-column section becomes part of the section above, and the page setup format changes to a single column, which is the format for the heading *GARDENING IS A WORKOUT?*.
13. Click the **Undo** button to restore the three-column format.
14. Save the changes, and leave the document open for the next Step-by-Step.

Adding Borders and Shading

Borders and shading also can help enhance the appearance of a document such as a newsletter or a flyer. Word offers many options for applying borders above, below, and around paragraphs of text. The borders can be customized by changing the line color, the line style, and the thickness of the line. You can also enhance the document content by adding shading behind the text.

Step-by-Step 17.2



IC3 2-1.2.1

1. If necessary, open the **Revised Newsletter 1** file from your solution files. Save the Revised Newsletter 1 document as **Revised Newsletter 2**, followed by your initials.
2. Position the insertion point anywhere in the heading *BENEFITS OF OWNING A PET*. Click the **HOME** tab, and in the Paragraph group shown in **Figure 17–5**, click the **Border** button arrow. In the menu, click **Top Border**. A border line is inserted across the entire top of the paragraph, which extends from the left margin to the right margin.

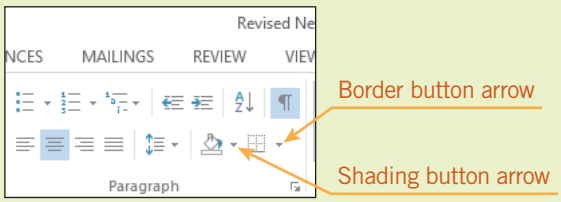
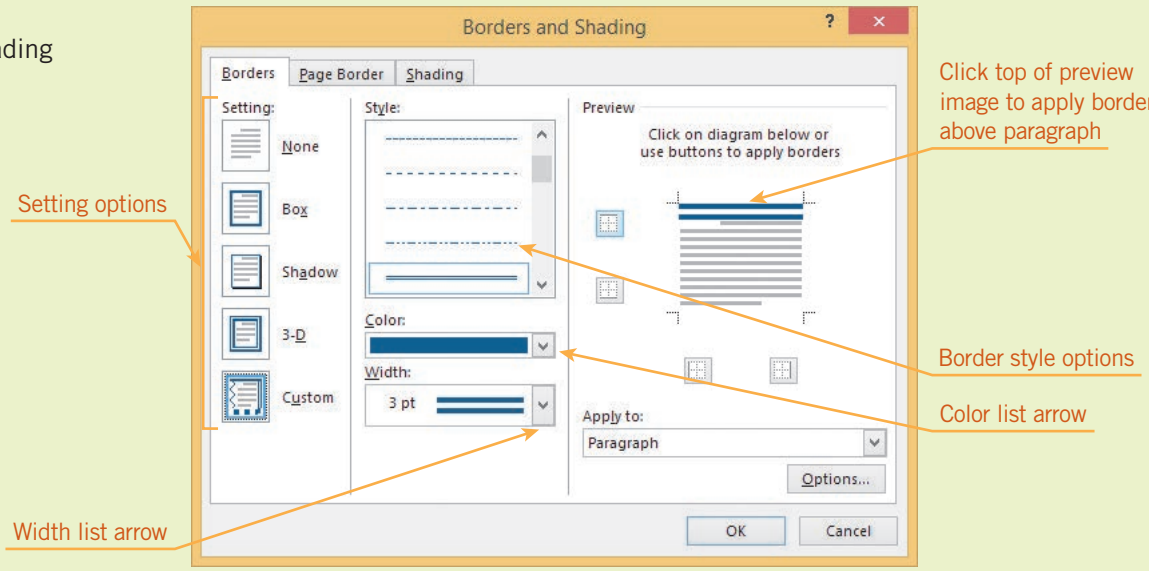


FIGURE 17–5
Paragraph group on the HOME tab

3. With the insertion point still positioned in the heading *BENEFITS OF OWNING A PET*, click the **Border** button arrow, and then click **No Border**. The border line is removed.
4. With the insertion point still positioned in the heading *BENEFITS OF OWNING A PET*, click the **Border** button arrow. At the bottom of the submenu, click **Borders and Shading** to open a dialog box similar to the one shown in **Figure 17–6**.

FIGURE 17–6
Borders and Shading dialog box



5. In the middle pane, scroll down through the Style options, and click the first border style with two lines. Click the **Color** list arrow, and then under *Theme Colors*, in the first row, click the **Dark Blue, Text 2** theme color. (The color name will display in a ScreenTip.)
6. In the middle pane, click the **Width** list arrow, and then click **3 pt**. The border style formats for all four borders are displayed in the Preview pane.
7. In the left pane, under *Setting*, click **None**. The borders are no longer displayed in the Preview pane. Under *Setting*, click the **Custom** setting option. In the Preview pane at the right, click at the top of the preview image to add a line, as shown in Figure 17–6. The Preview box shows the double-line style, the blue color, and the increased line width for the border at the top of the paragraph.
8. Compare your dialog box settings to those shown in Figure 17–6, and when your settings match, click **OK**. The border is inserted at the top of the paragraph where the insertion point is positioned.

9. Position the insertion point in the heading *GARDENING IS A WORKOUT?*. Click the **Border** button arrow, and then click **Top Border**. The same double-line, blue, 3-point border is inserted at the top of the paragraph.
10. Position the insertion point in the heading *HIKING AND BIKING ADVENTURES*. Note that the Border button image now displays a top border. Click the **Border** button. The custom top border style you created displays above the heading because that was the last border applied.
11. Position the insertion point in the first heading *BENEFITS OF OWNING A PET*. Click the **Shading** button arrow  . Under *Theme Colors*, in the second row, click the **Blue, Accent 1, Lighter 80%** color. Because shading is a paragraph format, a blue shade is applied to the entire paragraph where the insertion point is positioned.
12. Position the insertion point in the second heading *GARDENING IS A WORKOUT?*. Note the blue color you just applied is currently displayed on the Shading button. Click the **Shading** button to apply the blue shading.
13. Position the insertion point in the third heading *HIKING AND BIKING ADVENTURES*. Click the **Shading** button to repeat the shading formatting.
14. Save the changes, and leave the document open for the next Step-by-Step.

ABOVE AND BEYOND

To format shading for multiple paragraphs, select the paragraphs before clicking the Shading button.

Inserting and Formatting Graphics

To illustrate an idea presented in a document, or to make a document more functional, you can include ***graphics***, which are non-text items such as digital photos, scanned images, and pictures. You can also insert images created or modified in other applications, such as a drawing created in a graphics or drafting application. Graphics created in such an application are saved in a variety of formats, including JPEG (*.jpg), TIFF (*.tif), and bitmap (*.bmp).

VOCABULARY

graphics

clip art

Inserting Clip Art and Pictures

Clip art is a graphic that is ready to insert in a document. If you have an Internet connection open, Word has numerous illustrations and photographs you can access online. You can search for photos and clip art at the Microsoft Office.com Web site. This is called inserting an online picture.

You can access pictures that you have saved in the My Pictures folder or on SkyDrive. You can also connect to Facebook, Flickr, and other sites to get your pictures.

Step-by-Step 17.3

2-1.4.2

1. If necessary, open the **Revised Newsletter 2** file from your solution files. Save the Revised Newsletter 2 document as **Revised Newsletter 3**, followed by your initials.
2. Position the insertion point at the beginning of the paragraph under the heading *GARDENING IS A WORKOUT?*.
3. Click the **INSERT** tab. In the Illustrations group shown in **Figure 17–7**, click the **Online Pictures** button. The Insert Pictures dialog box, similar to the one shown in **Figure 17–8**, opens.

FIGURE 17–7
Illustrations group on the INSERT tab

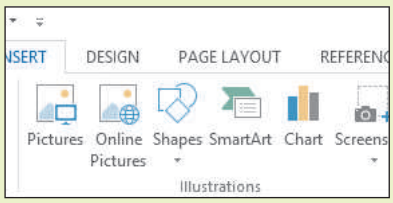
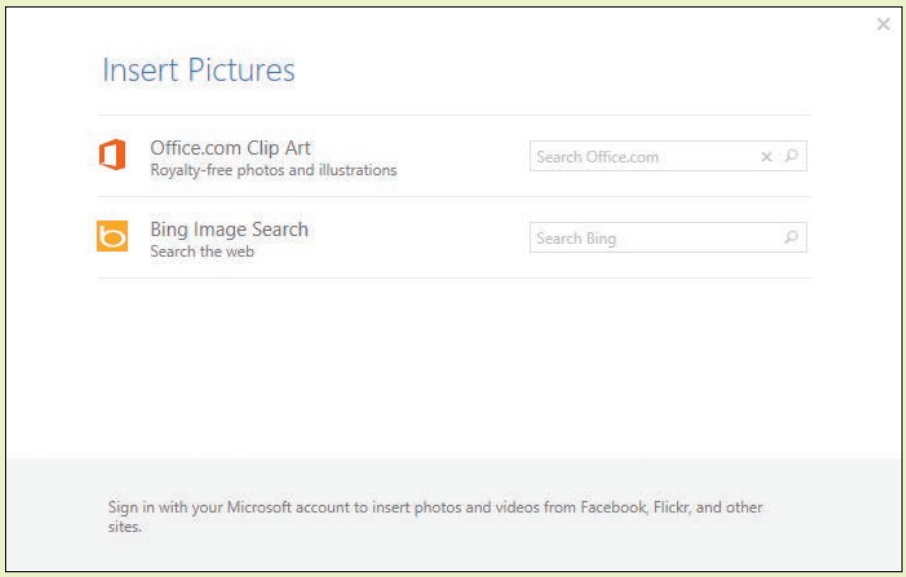


FIGURE 17–8
Insert Pictures dialog box



4. Do one of the following:
   a. If you do not have an Internet connection, read through the instructions in Steps 5 and 6 to become aware of the Online Pictures feature. Then continue performing the instructions beginning in Step 7.
   b. If you have an Internet connection, proceed to Step 5.
5. Position the insertion point in the Office.com Clip Art search box. Type **garden** and then press **Enter**. Hundreds of photos and illustrations that match the search text will display, similar to those shown in **Figure 17–9**. Scroll through the thumbnails to review some of the results.

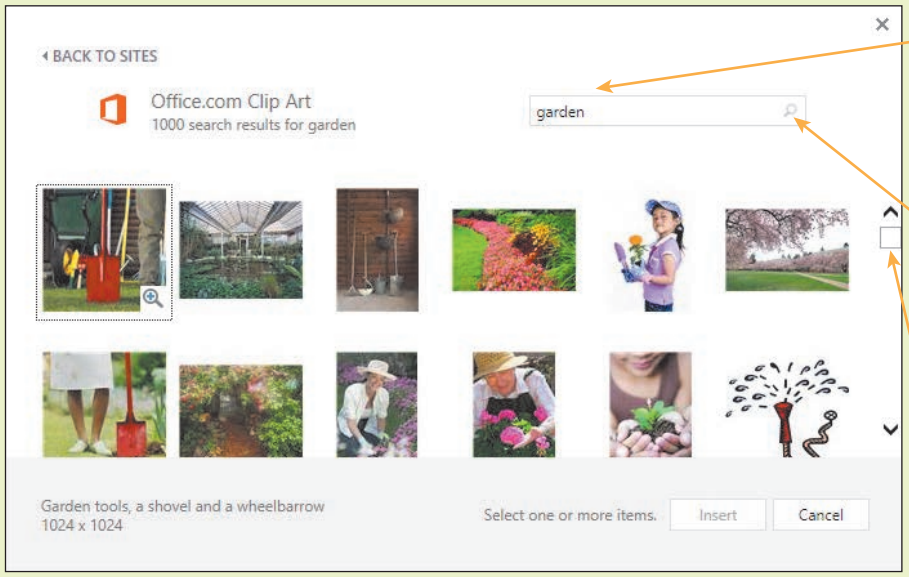


FIGURE 17–9
Online picture search results from Office.com content

6. To download one of these pictures, you would select the thumbnail and then click Insert. Instead, click **Cancel** to close the search results. Then, close the Insert Pictures dialog box.
7. The insertion point should still be positioned at the beginning of the first paragraph under the heading *GARDENING IS A WORKOUT?*. If necessary, click the **INSERT** tab. In the Illustrations group, click the **Pictures** button. The Insert Picture dialog box opens.
8. Navigate to the drive and folder where your Data Files folder is stored. Select the filename **Lilies.jpg**, and then click **Insert**. The picture is inserted at the location of the insertion point, as shown in **Figure 17–10**.

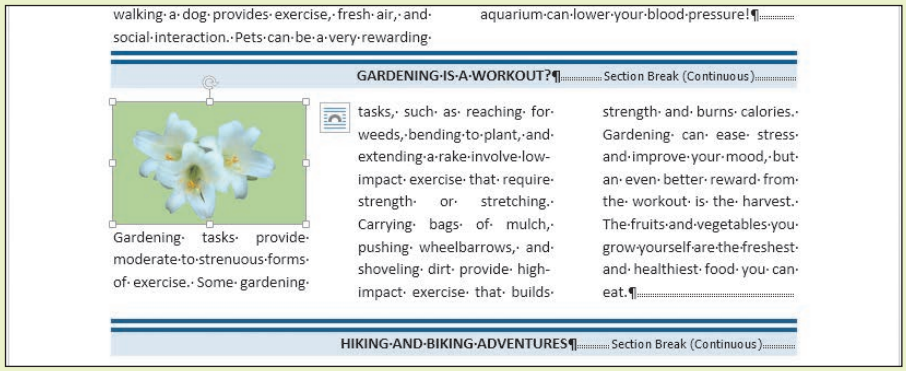


FIGURE 17–10
Lilies picture inserted in document

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9. Position the insertion point at the end of the paragraph under the first heading *BENEFITS OF OWNING A PET*. Click the **INSERT** tab and then click the **Pictures** button. The Insert Picture dialog box displays the folder where you selected the last picture. Select **Dog.jpg** and then click **Insert**. The Dog picture is inserted at the location of the insertion point.

10. Position the insertion point at the beginning of the first paragraph below the heading *HIKING AND BIKING ADVENTURES*. Click the **INSERT** tab and then click the **Pictures** button. Select the filename **Biker.jpg**, and then click **Insert**. The Biker picture is inserted at the location of the insertion point.
11. Note that after the Biker picture is inserted the picture does not fit on the page, so the picture and all the article text automatically wrap to a second page. Also note that there is a column break after the last line of text in the left column. The text will be adjusted when the picture is resized in Step-by-Step 17.4.
12. Save the changes, and leave the document open for the next Step-by-Step.

QUICK TIP

You may find it easier to work with graphics in a document by reducing the magnification of the document. For example, you can change the zoom of the document view to 75 percent.

Resizing and Cropping a Graphic

VOCABULARY
sizing handles
resizing
crop
outcrop

Once you have inserted a graphic or picture in a document, there are many ways to manipulate the picture. To work with a graphic, you must select it. You will know it is selected when you see ***sizing handles***, eight small circles and squares on the border of the graphic. When a graphic is selected, you can resize, cut, copy, paste, delete, and move it just as you would text.

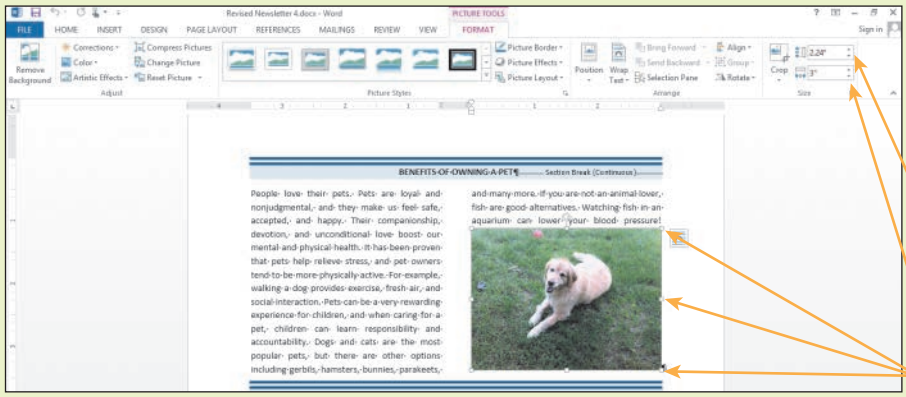
Resizing stretches or shrinks the dimensions of a graphic. You can resize a graphic just vertically or just horizontally by using one of the square sizing handles on the side of the graphic, but this will distort the image. To change the size of a graphic without distorting the image, you must scale the graphic proportionally by dragging one of the circle corner sizing handles; these change both dimensions of the graphic (height and width) to maintain the proportions of the graphic.

When you ***crop*** a graphic, you cut off portions of the graphic that you do not want to show. When you ***outcrop*** a graphic, you add extra white space around the image.

Step-by-Step 17.4

IC3
2-1.4.1
2-1.4.2

1. If necessary, open the **Revised Newsletter 3** file from your solution files. Save the Revised Newsletter 3 document as **Revised Newsletter 4**, followed by your initials. Click the **VIEW** tab. If necessary, enable the **Ruler** option in the Show group.
2. Click the **Dog** picture. When the picture is selected, the Ribbon adapts to display several more tools. Click the **PICTURE TOOLS FORMAT** tab to show the options shown in **Figure 17–11**. Eight sizing handles appear on the outside border of the image. A nonprinting border around the picture is also displayed.



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FIGURE 17–11
PICTURE TOOLS FORMAT tab and selected object

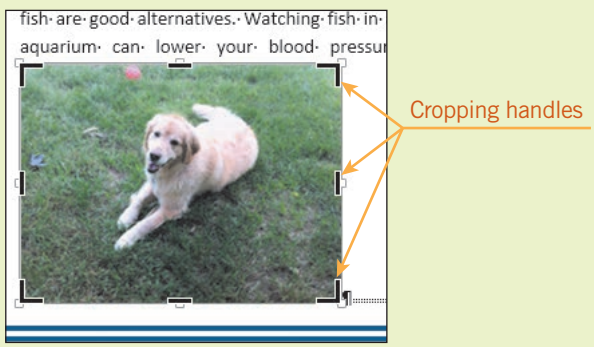
3. Point to the upper-left corner of the selected image. When the pointer changes to a two-headed arrow, drag the **corner sizing handle** towards the top of the document window. As you drag the sizing handle, you can see the picture size expands proportionally.
4. Click the **Undo** button to restore the original picture size.
5. Point to the lower-right corner of the selected image. When the pointer changes to a two-headed arrow, drag the **corner sizing handle** towards the center of the graphic. Use the rulers at the top of the document window to judge the picture size. When the picture is approximately 2 ½ inches wide, release the mouse.
6. Click the **Lilies** picture to select the graphic object. In the Size group, click the **Shape Height** box down arrow two times to change the height to 1". As you change the height setting, the width setting is automatically adjusted.
7. Scroll down and click the **Biker** picture. In the Shape Height box, select the setting **2.45"**, and type **2**. Note that the setting in the Width box is automatically adjusted. Click in the document window. The picture size is adjusted proportionally.
8. Scroll up and click the **Dog** picture. Click the **PICTURE TOOLS FORMAT** tab. In the Size group, click the top of the **Crop** button. The sizing handles change in appearance, as shown in **Figure 17–12**.

QUICK TIP

After resizing the picture, to confirm the width, the measurements are displayed in the Width box in the Size group on the PICTURE TOOLS FORMAT tab.

ABOVE AND BEYOND

To change the size of an image to exact measurements, in the Size group on the PICTURE TOOLS FORMAT tab, change the settings in the Shape Height and Shape Width boxes.

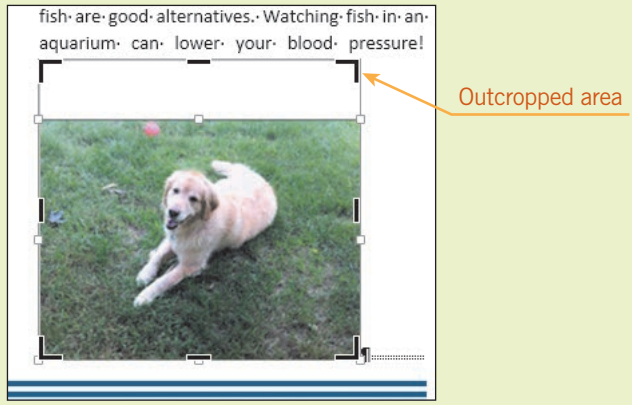


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FIGURE 17–12
Cropping handles

9. Point to the *middle cropping handle* on the top border. When you hover the mouse pointer over the cropping handle, the pointer changes to ⊥. Then drag the **top border** upward to outcrop the picture. The cropping line appears as you move the image border. When you release the mouse button, additional white space is added to the picture as shown in **Figure 17–13**.

FIGURE 17–13
Outcropped image

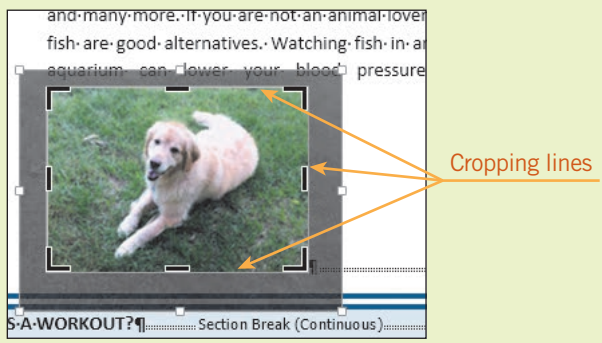


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10. The image is still selected and the cropping handles are still visible. Point to the *middle cropping handle* in the top border, and then drag the **border** down to crop to just below the red ball in the picture.

11. Crop the other three sides of the picture:
    a. Point to the *middle cropping handle* on the bottom border, and drag the **bottom border** up to crop the picture just below the dog's paws.
    b. Drag the **left border** inward about **¼"**.
    c. Drag the **right border** inward about **¼"**.
    d. When the cropping line on your screen is similar to the one shown in **Figure 17–14**, click outside the picture. The portion of the picture you cropped is gone.

FIGURE 17–14
Cropping lines



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12. Click the **Dog** picture. On the PICTURE TOOLS FORMAT tab, click the **Crop** button arrow, and then point to *Crop to Shape*. The Shapes menu shown in **Figure 17–15** is displayed. Under *Basic Shapes*, in the third row, click the **Heart** shape. (A ScreenTip displays the name of the shape.) The image adapts to the new shape.

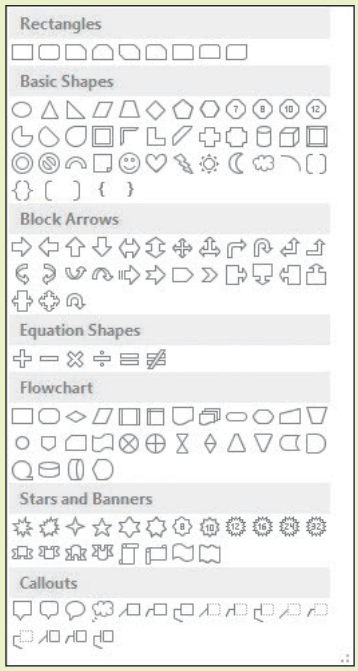


FIGURE 17–15
Shapes menu

13. Click the **Lilies** picture. Click the **Crop** button arrow, point to *Crop to Shape*, and then under *Basic Shapes*, in the first row, click the **Oval** shape.
14. Save the changes, and leave the document open for the next Step-by-Step.

ABOVE AND BEYOND

To reduce file sizes you can reduce the picture resolution, discard unwanted data such as the cropped parts of a picture, and/or you can compress the pictures and illustrations in the document. On the PICTURE TOOLS FORMAT tab, in the Adjust group, click the Compress Pictures button. In the Compress Pictures dialog box, you can select from several options based on the targeted output. Compressing pictures changes the quality of the pictures, so it is recommended you compress the pictures before formatting special effects and removing backgrounds.

Positioning a Graphic

By default, when you insert a graphic, Word positions the graphic in the line of text. This means that the graphic is positioned directly in the text at the insertion point. However, you can format the text in the document to wrap around the graphic. A text-wrapping format must be applied to the graphic before you can reposition the graphic in your document. You can then drag and drop the graphic anywhere within the printable area of the page.

Step-by-Step 17.5

2-1.1.6
2-1.4.2

1. If necessary, open the **Revised Newsletter 4** file from your solution files. Save the Revised Newsletter 4 document as **Revised Newsletter 5**, followed by your initials.
2. Click the **Dog** picture. If necessary, click the **PICTURE TOOLS FORMAT** tab. In the Arrange group, click the **Wrap Text** button. The menu shown in **Figure 17–16** displays. Note that at the top of the menu the In Line with Text option is already highlighted. Move the mouse pointer over each of the other options to see the Live Preview of the other options. Then click **Tight**.

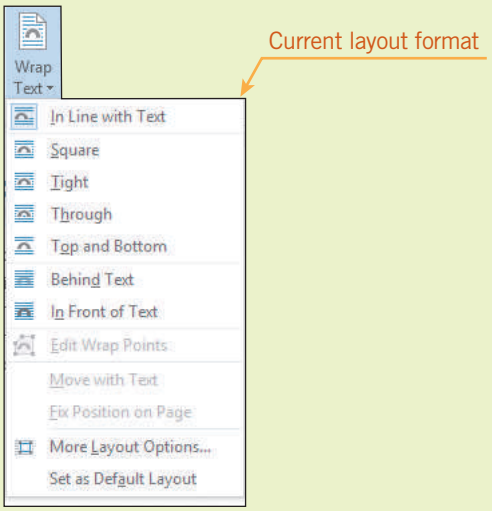
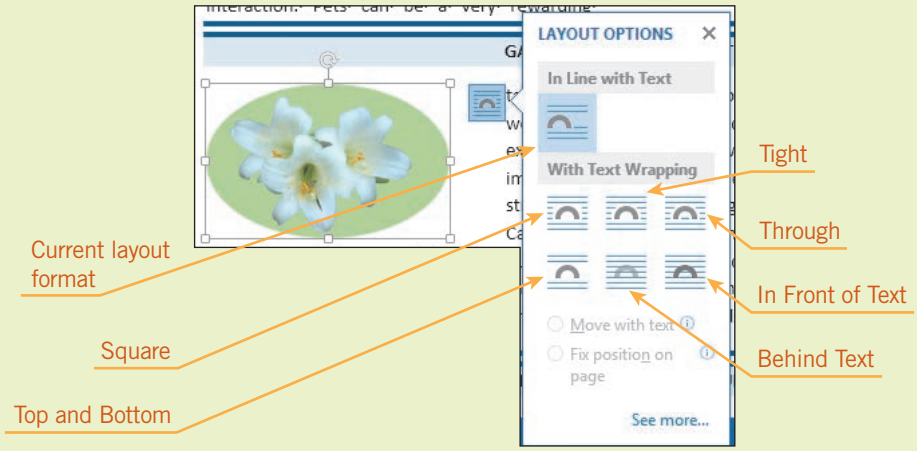


FIGURE 17–16
Layout Options menu on the Ribbon

3. After applying a text-wrapping format to a graphic, you can move the graphic around in the document. Hover the mouse pointer over the *Dog* picture. When the pointer changes to a four-headed arrow, drag the **graphic** to the center of the article. The text wraps around the heart shape.
4. Click the **Lilies** picture. On the right side of the graphic, click the **Layout Options** button. The Layout Options menu displays as shown in **Figure 17–17**. Hover over each option to display the ScreenTips. Click the **Top and Bottom** option. Close the Layout Options menu.



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FIGURE 17–17
Layout Options button menu

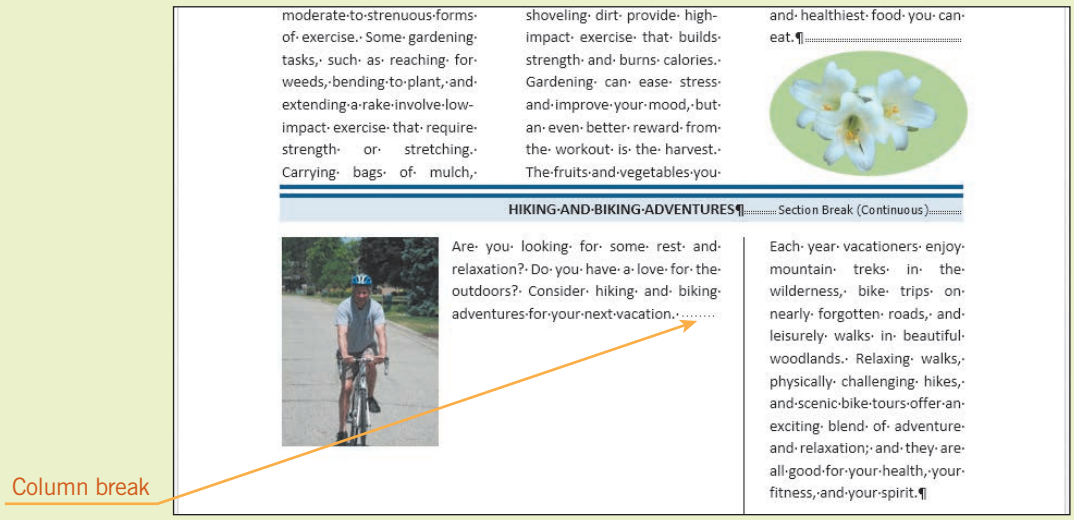
QUICK TIP

If you have difficulty positioning the graphics as described in the Step-by-Step, click the Undo button, then click the tool and try again.

5. Drag the **Lilies** picture so it is positioned below the text of the third column. A green guideline will display when the picture is aligned with the right margin.
6. Click the **Biker** picture. Click the **Layout Options** button, and then click **Square**. Close the Layout Options menu. The picture is aligned at the left side of the left column, and the text in the left column wraps on the right side of the picture.
7. As noted earlier, the picture affects where the text wraps in the left column, and as shown in **Figure 17–18**, the manual column break now breaks the column at the end of a sentence, and the amount of text in each column is not balanced.

ABOVE AND BEYOND

When text is wrapped around an image or object, the image is anchored to a paragraph in the document. When nonprinting characters are displayed, you may see the object anchor symbol ⚓ at the beginning of a paragraph. You can drag and drop the anchor symbol to anchor the object to a different location in the document.



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FIGURE 17–18
Manual column break

8. If necessary, enable the Show/Hide ¶ option. Position the insertion point at the beginning of the first line in the second column. Press the **Backspace** key to delete the column break. The manual column break is removed, and the text from the second column automatically moves back to fill in the first column.

9. Position the insertion point in front of the sentence in the left column that begins *Relaxing walks*. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **Breaks** button, and then click **Column**. The text after the column break automatically flows to the second column.
10. Save the changes, and leave the document open for the next Step-by-Step.

Adjusting Colors and Applying Styles and Effects

You can customize clip art or a photograph by changing its colors. You can match the colors in the current design theme, or you can create your own custom color scheme. Adjusting colors is especially useful if you want to recolor images to match other colors in the document. You can recolor both photos and illustrations. For photos, there are also options for changing the color saturation and the color tone.

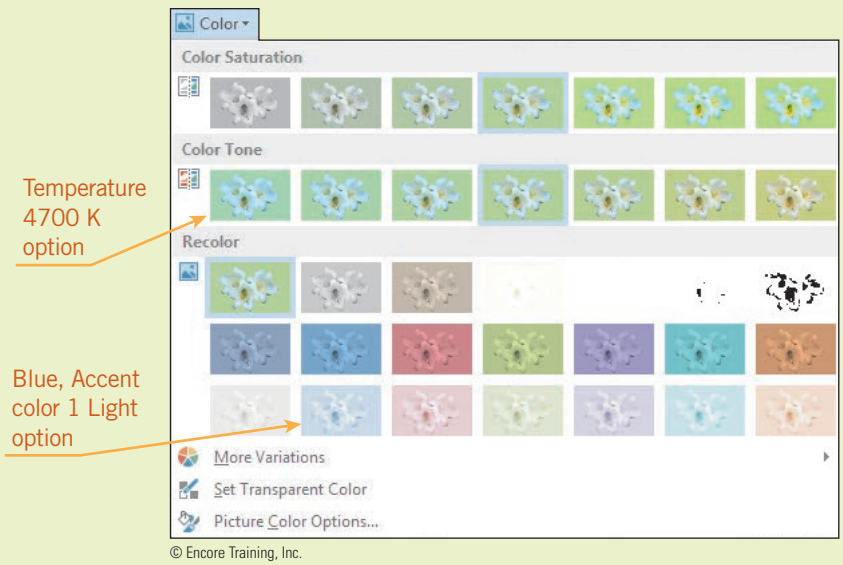
To further enhance the appearance of the image, you can apply border styles and other special formats, such as shadows, soft edges, and 3-D effects. You can also add artistic effects to pictures to make the picture look like a sketch or a painting.

Step-by-Step 17.6

IC3
2-1.2.1
2-1.4.2

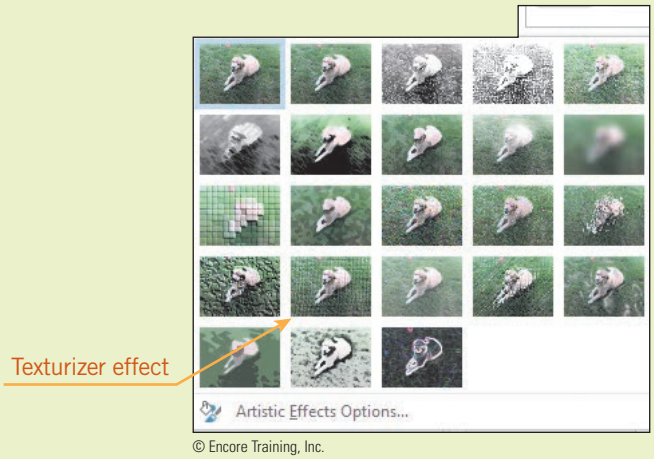
1. If necessary, open the **Revised Newsletter 5** file from your solution files. Save the Revised Newsletter 5 document as **Revised Newsletter 6**, followed by your initials.
2. Click the **Lilies** picture. Click the **PICTURE TOOLS FORMAT** tab. In the Adjust group, click the **Color** button to show the options shown in **Figure 17–19**. Hover the mouse pointer over the thumbnails to show Live Previews of the picture in a variety of colors with both light and dark backgrounds.

FIGURE 17–19
Thumbnails for color options



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3. Under *Color Tone*, click the first thumbnail **Temperature: 4700 K**. A blue color tone is added to the lilies.
4. Click the **Dog** picture to select it. Click the **Color** button. Under *Recolor*, in the last row, click the second option, **Blue, Accent color 1 Light**.
5. Click the **Color** button. Under *Color Saturation*, click the last option, **Saturation: 400%**.
6. Click the **Undo** button twice to restore the Dog picture to its original colors.
7. The Dog picture should still be selected. In the Adjust group, click the **Artistic Effects** button  . As shown in **Figure 17–20**, thumbnails show previews of several artistic effects. Move the mouse pointer over some of the thumbnails to see the Live Preview of the artistic effects. Then in the fourth row, second column, click the **Texturizer** effect.



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FIGURE 17–20
Thumbnails for artistic effects options

8. Select the **Lilies** picture. In the Picture Styles group, click the **More** button to show all the built-in picture styles shown in **Figure 17–21**. Move the mouse pointer over some of the thumbnails to see the Live Preview of the picture styles. Then in the second row, sixth column, click the **Center Shadow Rectangle** style. When the picture style is applied to the selected image, the layout of the text in the columns is adjusted.

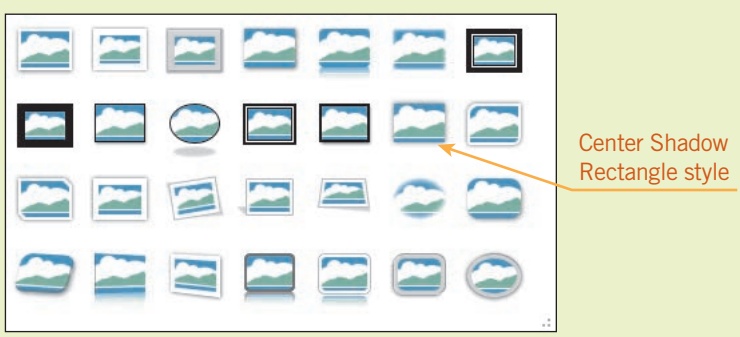


FIGURE 17–21
Built-in picture styles

9. Click the **Dog** picture. In the Picture Styles group, click the **Picture Effects** button, and then point to *Glow* to display the options shown in **Figure 17–22**. Move the mouse pointer over some of the thumbnails to see the Live Preview of the glow variations. Then in the last row, click the first option, **Blue, 18 pt glow, Accent color 1**.

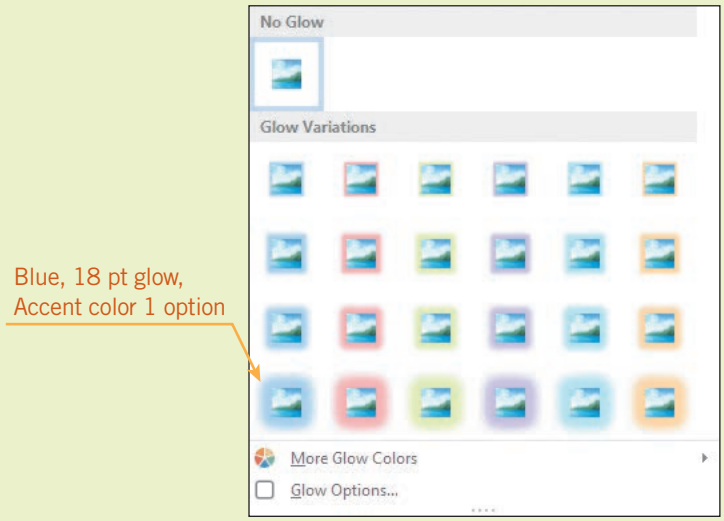


FIGURE 17–22
Picture effects options for glow variations

10. The Dog picture should still be selected. In the Picture Styles group, click the **Picture Border** button arrow. Under *Theme Colors*, in the first row, click the **White, Background 1** color.
11. The Dog picture should still be selected. Click the **Picture Border** button arrow, point to *Weight*, and then click **3 pt**.
12. Save the changes and leave the document open for the next Step-by-Step.

Removing Backgrounds from Pictures

Sometimes the background colors do not fit the color scheme of the document, or you may just not want to include the background in a picture. When working with illustrations and photographs that have a solid color background, you can hide the background color by making the color transparent. When you enable the Set Transparent Color feature and click a color in the image, all the pixels of that color become transparent.

Word also provides a feature for automatically removing the background colors and images from a picture. When you apply the Remove Background feature, Word automatically suggests the elements to be removed from the image. If you are not satisfied with the results, you can identify the parts you want to keep or remove.

Even after a background has been removed from illustrations and photographs, you can still add effects such as shadows, glows, and reflections to the parts of the picture that are still visible. You can also clarify elements in a picture using contrast controls, and you can lighten or darken the picture by using the brightness controls.

Step-by-Step 17.7

IC3
2-1.2.1
2-1.4.1
2-1.4.2

1. If necessary, open the **Revised Newsletter 6** file from your solution files. Save the Revised Newsletter 6 document as **Revised Newsletter 7**, followed by your initials.
2. Select the **Lilies** picture. Click the **PICTURE TOOLS FORMAT** tab. In the Adjust group, click the **Color** button, and then click **Set Transparent Color**. The mouse pointer changes to a pen with an arrow. Click the background color in the picture. All pixels of that color in the image become transparent.
3. On the Quick Access Toolbar, click the **Undo** button to restore the background color.
4. Select the **Biker** picture. Click the **PICTURE TOOLS FORMAT** tab. In the Adjust group, click the **Remove Background** button. The Ribbon adapts to show the BACKGROUND REMOVAL tab shown in **Figure 17–23**.

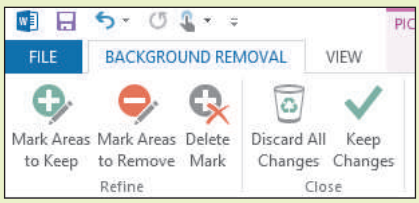


FIGURE 17–23
BACKGROUND REMOVAL tab

5. Note that the picture in the document window now displays a bright pink background, and a marquee with sizing handles is displayed to indicate what the borders of the image will be after the background is removed. Anything bright pink will be removed. Drag the **middle sizing handle** on the bottom marquee border below the picture border as shown in **Figure 17–24**, and then release the mouse. The marquee is readjusted so the bottom of the bike is included within the border.

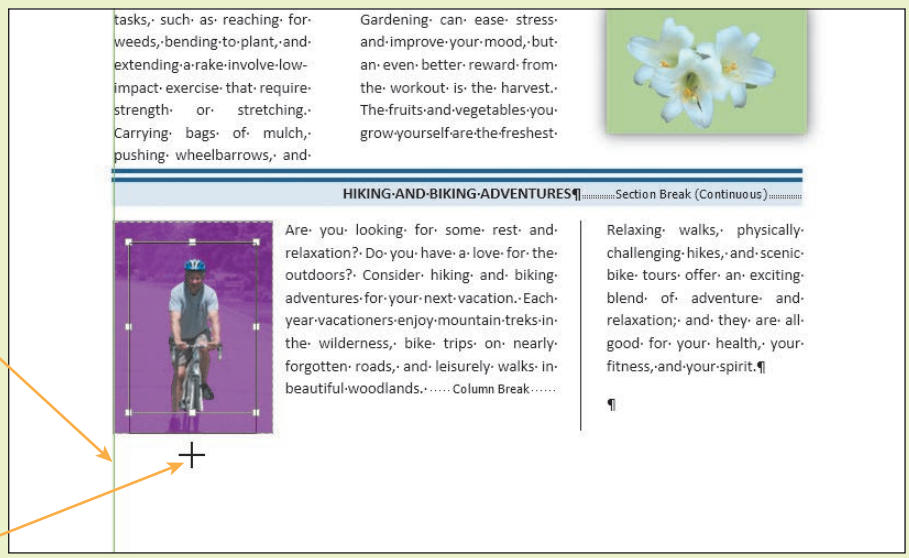
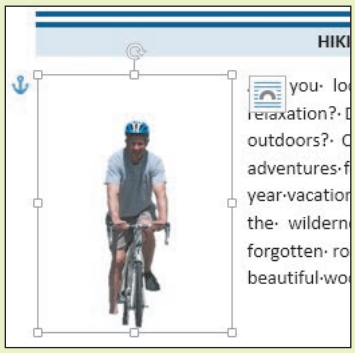


FIGURE 17–24
Readjusting the removal marquee

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6. In the Close group, click the **Keep Changes** button. The picture should now appear as shown in **Figure 17–25**.



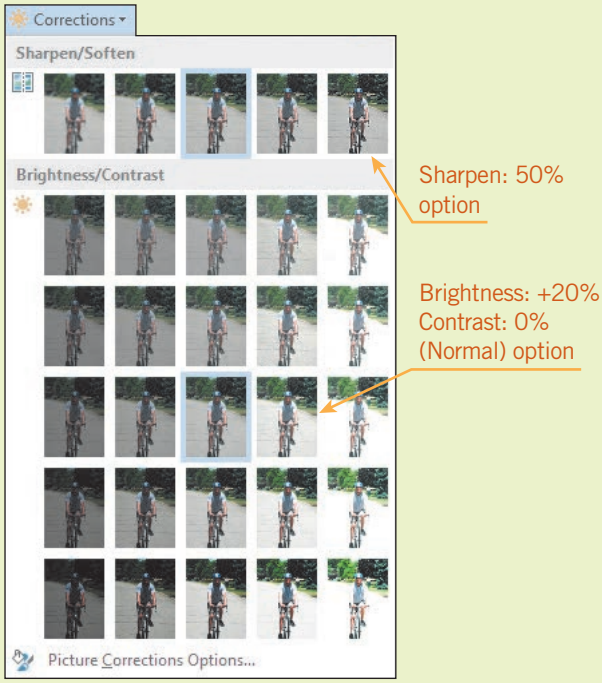
© Encore Training, Inc.

FIGURE 17–25
Biker picture after background removal

QUICK TIP

Depending on the background elements, you may not be satisfied with the proposed removal. To identify parts of the picture that you do not want removed automatically, click the Mark Areas to Keep button. To identify additional parts of the picture you want to remove, click the Mark Areas to Remove button. The mouse pointer changes to a pencil, and you can drag horizontal and vertical lines to identify the area. To undo any lines you add, click the Delete Mark button.

7. The Biker picture should still be selected. In the Size group, click the top of the **Crop** button, and drag the **middle crop handle** on the top border down to crop the white space at the top of the picture. Then click outside the picture.
8. Select the **Biker** picture, and drag it upward to align with the top of the column. The picture should be aligned to the upper-left corner of the article, with the text aligned to the right side of the picture.
9. The Biker picture should still be selected. If necessary, scroll up so the Biker picture is positioned at the bottom of the document window. On the PICTURE TOOLS FORMAT tab, in the Adjust group, click the **Corrections** button. As shown in **Figure 17–26**, options for sharpening and softening the image or changing the brightness and contrast are displayed.



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FIGURE 17–26
Corrections options

10. Move the mouse pointer over some of the thumbnails to see the Live Preview of the correction options. Then under *Brightness/Contrast*, in the third row, fourth column, click the **Brightness: +20% Contrast: 0% (Normal)** thumbnail.
11. The Biker picture should still be selected. Click the **Corrections** button. Under *Sharpen/Soften*, click the last option, **Sharpen: 50%**.
12. Save the changes, and leave the document open for the next Step-by-Step.

Creating Your Own Graphics

Sometimes you may need to create your own graphics. For example, you may want to create a fancy title for a document, a map, or an organizational chart. Word offers several tools to simplify these tasks.

Creating WordArt Objects

WordArt is a feature that transforms text into a graphic. The WordArt graphic is created in a ***text box***, a drawing object that displays text. Because the text box is a graphic, you can resize and position it like other graphics. Within the text box, you can change the font style, color, and size. To make the text decorative, you can fit the text within a preset shape, apply a gradient file, change the angle of the text, and apply special effects such as text borders and shadows. You can create your own styles, or you can choose from several predefined styles in the WordArt Gallery. Just like other objects, you can resize and reposition the WordArt object in the document.

VOCABULARY
WordArt
text box

Step-by-Step 17.8

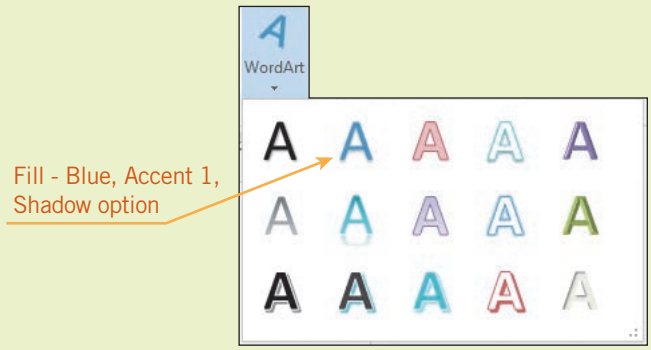


1. If necessary, open the **Revised Newsletter 7** file from your solution files. Save the Revised Newsletter 7 document as **Revised Newsletter 8**, followed by your initials.
2. Position the insertion point at the top of the page. Click the **PAGE LAYOUT** tab, and in the Page Setup group, click the **Margins** button. At the bottom of the menu, click **Custom Margins**. Under *Margins*, change the *Top margin* setting to **1.5** and the *Bottom margin* setting to **.5**. Click **OK**.

IC3
2-1.1.6
2-1.2.1
2-1.3.6
2-1.4.2
2-2.2.1

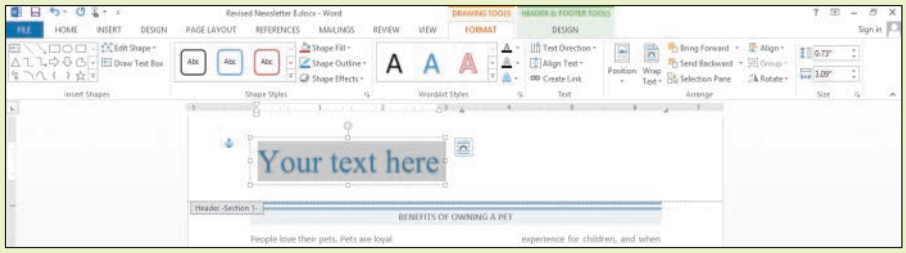
3. Double-click in the white area at the top of the document to position the insertion point in the header pane. Click the **INSERT** tab. In the Text group, click the **WordArt** button to open the WordArt gallery shown in **Figure 17–27**.

FIGURE 17–27
WordArt gallery



4. In the first row, second column, click the option **Fill - Blue, Accent 1, Shadow**. A new text box is displayed in the header section, and the Ribbon changes to show the DRAWING TOOLS FORMAT tab, shown in **Figure 17–28**.

FIGURE 17–28
DRAWING TOOLS FORMAT tab and WordArt text box



QUICK TIP

You can also select existing text and click the WordArt button to create a WordArt graphic using the selected text.

5. The placeholder text *Your text here* is already selected. Type **Health News**. The width of the text box automatically adjusts to fit the new text. Select the new text and use the Mini toolbar to change the font size to **48** pt.
6. Point to the *middle sizing handle* on the right border of the text box, then click and drag the **sizing handle** to expand the width of the text box to the right margin. Use the green guide lines to align and expand the box exactly to the right margin where the border line and text end. The text box expands, and the text within the text box is automatically centered.
7. With the text box still selected, click the **DRAWING TOOLS FORMAT** tab. In the Shape Styles group, click the **Shape Fill** button. Under *Theme Colors*, second row, fourth column, click the **Dark Blue, Text 2, Lighter 80%** color.
8. Select all the text in the text box. In the WordArt Styles group, click the **Text Effects** button and point to *3-D Rotation*. Move the mouse pointer over some of the 3-D rotation options under *Perspective* to see the Live Preview.

9. In the Text Effects menu, point to *Transform* to show the options shown in **Figure 17–29**. Under *Warp*, in the second row, select the first option, **Chevron Up**. Note that the shape changes, but the effects, including the text, fill color, and line colors remain unchanged.

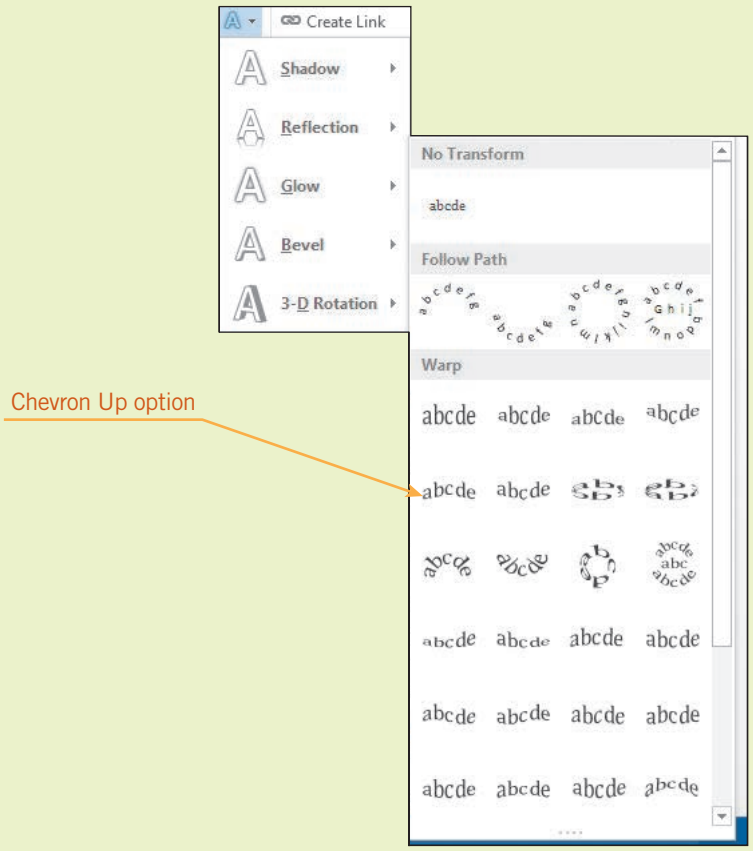


FIGURE 17–29
Transform options

10. Click the **HOME** tab, and in the Paragraph group, click the **Show/Hide ¶** button to hide the nonprinting characters. Click the **VIEW** tab, and in the Zoom group, click the **One Page** button.
11. Like photographs and clip art, you can position a WordArt object anywhere in the document and wrap text around the object. With the WordArt object selected, click the **Layout Options** button, and then click **Square**.
12. Position the mouse pointer somewhere around the border of the WordArt graphic to show the four-headed arrow. Then drag and drop the **WordArt graphic** to reposition it in the middle of the document.
13. Click the **Undo** button. Double-click in the body of the document to close the header and footer panes.
14. Save the changes, and close the document.

Inserting Lines, Shapes, and Text Boxes

VOCABULARY
drawing objects
shape

You can use ***drawing objects***, which are shapes, curves, and lines, to create your own graphic. A ***shape*** is a predesigned drawing object, such as a star, an arrow, or a rectangle. You can resize and reposition drawing objects the same way you change the size and position of pictures and clip art, and the drawing objects can be changed and enhanced with color, patterns, and borders.

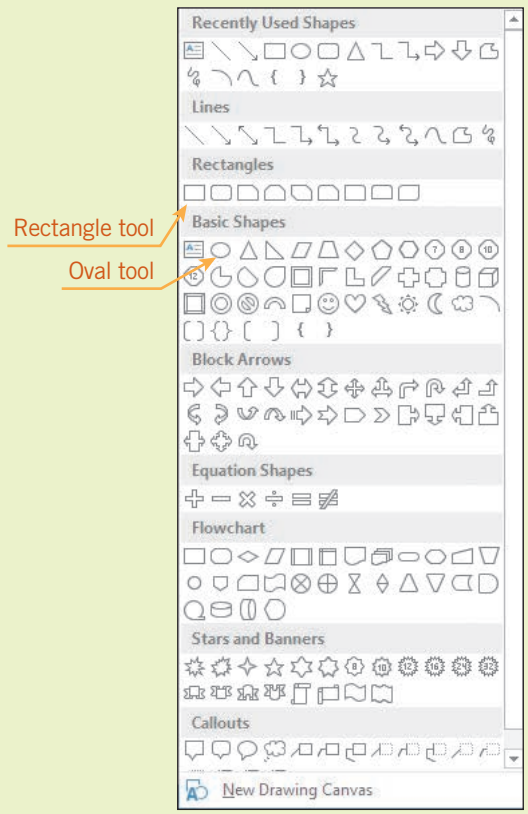
You can copy and paste lines, shapes, objects, and text boxes just like you copy and paste text and graphics. You can even change the direction of the text in the text boxes so the text is displayed vertically. When you are creating a drawing that requires multiple horizontal lines, begin by creating and formatting the first line. Then copy and paste multiple copies of the line in the document window and start building. Not only will you save time, but the objects will be more consistent. If you do not want all the objects to be exactly the same size, you can resize them after you paste them in the document.

Step-by-Step 17.9

IC3
2-1.2.1
2-1.3.6
2-1.4.1
2-1.4.2

1. Open a new blank document. Show the nonprinting characters and, if necessary, display the ruler. Also, if necessary, change the Zoom setting to **One Page**. Then save the document as **Simple Shapes**, followed by your initials.
2. Click the **INSERT** tab. In the Illustrations group, click the **Shapes** button to display the shape tools shown in **Figure 17–30**. Under *Lines*, click the first shape, the **Line** tool. A ScreenTip displays the name of the tool. The pointer changes to a crosshair + when positioned in the document window.

FIGURE 17–30
Shape tools



3. Point to the *paragraph marker*, and drag the **crosshair** across the entire width of the document, from the left margin to the right margin. Do not release the mouse button until the line is straight, even, and the length you want. When you release the mouse button, the Ribbon adapts and shows the DRAWING TOOLS FORMAT tab.
4. With the line still selected (the sizing handles on each end of the line indicate that the line is selected), in the Shape Styles group, click the **Shape Outline** button arrow, and then point to *Weight*. Click **3 pt**. The weight of the selected line is now heavier.
5. Notice that the shapes are also available in the Insert Shapes group on the DRAWING TOOLS FORMAT tab shown in **Figure 17–31**. Click the **More** button, and then click the **Line** tool again. Draw a second line, this time drawing the line diagonally across the document window from the left end of the first line to the lower-right corner of the screen. With the second line still selected, click the **Shape Outline** button arrow, and under *Standard Colors*, click the **Red** color. The color of the line changes.

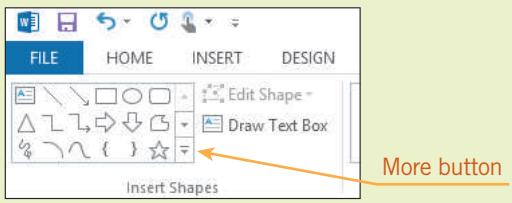


FIGURE 17–31
Insert Shapes group on the DRAWING TOOLS FORMAT tab

6. In the Insert Shapes group, click the **More** button, and then under *Rectangles*, click the first shape, the **Rectangle** tool. Position the crosshair just above the horizontal line at the top of the document at about the 2 inch mark on the horizontal ruler. Drag the **crosshair** down and to the right to create a box approximately 3 inches high and 4 inches wide. This box should overlap both the horizontal and diagonal lines.
7. With the rectangle object still selected, in the Shape Styles group, click the **Shape Fill** button arrow, and then under *Theme Colors*, click the **Green, Accent 6** color. The rectangle object is filled with the green color.
8. In the Insert Shapes group, click the **More** button, and in the Block Arrows section, click the first shape, the **Right Arrow** tool. Begin drawing the arrow in the middle of the green rectangle, and make the arrow wide enough that it extends beyond the right edge of the rectangle and is approximately 1 ½ inches high.
9. Click the **INSERT** tab. In the Text group, click the **Text Box** button. Several built-in text box options are displayed. At the bottom of the gallery, click **Draw Text Box**. In the middle of the green rectangle, on top of the right arrow, draw a box about 2 ½ inches high by 3 ½ inches wide. When you release the mouse button, the insertion point is positioned inside the box. Type your first name in the box.

ABOVE AND BEYOND

To create a perfect square, select the Rectangle shape and hold down Shift as you drag the crosshair; or after selecting the Rectangle tool, just click once in the document to insert a 1" × 1" square.

ABOVE AND BEYOND

When you choose one of the Callout tools from the menu of shapes, the shape is automatically formatted as a text box so you can add text inside the object.

10. Select the text in the text box, then right-click the **selected text** and use the Mini toolbar to change the font size to **24 pt**. Keep the text selected. If necessary, click the **DRAWING TOOLS FORMAT** tab. In the Text group, click the **Text Direction** button, and then click **Rotate all text 270°**. Click a blank area in the text box to deselect the text.
11. As you create the objects, they are layered with the most recent objects placed on top. The text box is on top of the arrow, which is on top of the rectangle, which is on top of the diagonal and horizontal lines. The new text box should still be selected. In the Arrange group, click the **Send Backward** button arrow, and then click **Send Backward**. The text box moves backward one layer and is now positioned behind the arrow.
12. With the text box still selected, click the **Send Backward** button arrow, and then click the **Send to Back** button. The name in the text box is no longer visible because the text box is now positioned at the bottom of the stack. Click the **Undo** button.
13. Click the **diagonal line** to select it. In the Arrange group, click the **Bring Forward** button arrow, and then click **Bring Forward**. The diagonal line moves forward one layer, in front of the rectangle but behind the text box. Click the **Bring Forward** button arrow, and then click **Bring to Front**. The diagonal line is on the top of the stack.
14. Save the changes, and then close the document.

ABOVE AND BEYOND

If time permits, open a new blank document and create more objects. Select the objects and explore the shape styles, shadow effects, and 3-D effects.

Creating SmartArt Graphics

Now that you know how to create text boxes and use the drawing tools, consider how you would create an organizational chart. You would need to create multiple text boxes, arrange and align the boxes to show a hierarchy, connect the boxes with horizontal and vertical lines, and then add text to the boxes. To create an effective illustration would be a tedious task, and you would likely spend a significant amount of time designing and creating the objects. But you can save yourself a lot of time and effort by using SmartArt graphics. ***SmartArt*** graphics are built-in, predesigned, and formatted layouts that you can use to illustrate concepts and ideas. The graphics are organized in a gallery under eight different categories, and each category includes several layouts. You can see the Live Preview of the layouts to help you choose the graphic that best suits your needs. Once you choose a design, you can focus on the content and quickly produce a professional illustration.

VOCABULARY

SmartArt

drawing canvas

Like the building blocks for headers, the objects in the SmartArt graphics include fields, and you can replace the field placeholder text. The field placeholder text does not print in SmartArt graphics, so if you do not enter data in a field, you do not need to delete the placeholder text. The designs are based on contemporary layouts, and the styles and formats used in the designs are easy to modify.

A SmartArt graphic is inserted in the document in a ***drawing canvas*** that provides a frame-like boundary between the graphic and the rest of the document. Using the drawing canvas is especially helpful if the graphic contains several shapes, because it keeps the shapes together as one object. You can easily add or remove objects, and you can reposition the graphic by dragging and dropping the object.

Step-by-Step 17.10

1. Open a new blank document. Save the document as **Scientific Process**, followed by your initials. If necessary, show the nonprinting characters.
2. Change the Zoom setting to **100%**. Click the **INSERT** tab, and in the Illustrations group, click the **SmartArt** button. The Choose a SmartArt Graphic dialog box opens.
3. In the left pane, click **Cycle**. Several new diagrams are displayed in the center pane.
4. Click the first option, the **Basic Cycle** SmartArt graphic. A color preview of the Basic Cycle layout is displayed in the Preview pane, and a description of the layout is included in the Preview pane, as shown in **Figure 17–32**. Click **OK**. The graphic is inserted in the document.

IC3
2-1.1.6
2-1.2.1
2-1.3.6
2-1.4.2

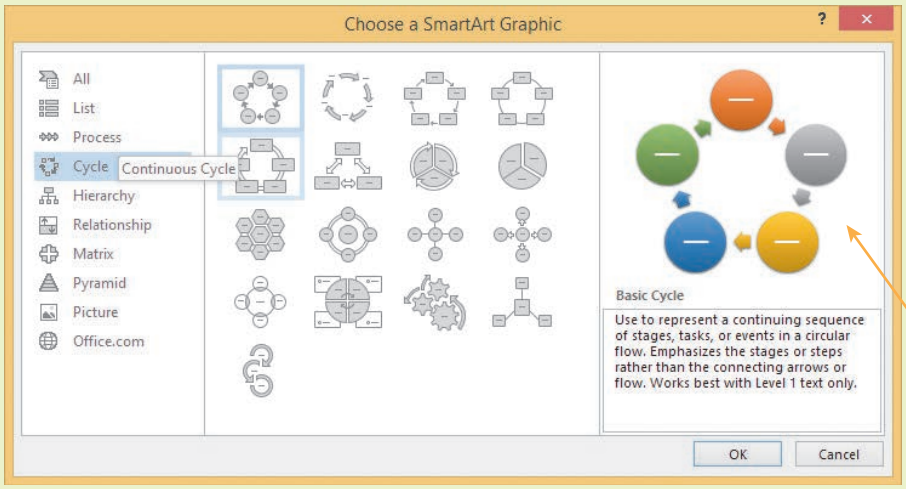


FIGURE 17–32
Choose a SmartArt Graphic dialog box

QUICK TIP

You can resize the canvas for a SmartArt graphic just as you resize other objects.

5. When the SmartArt graphic is selected, the SMARTART TOOLS DESIGN tab shown in **Figure 17–33** is active. All the objects in the SmartArt graphic are contained in a canvas. Each shape in the graphic includes placeholder text. The Text pane is displayed on the left side of the canvas. (If the Text pane is not displayed as shown in Figure 17–33, on the left side of the SmartArt graphic, click the arrow to open the Text pane.)

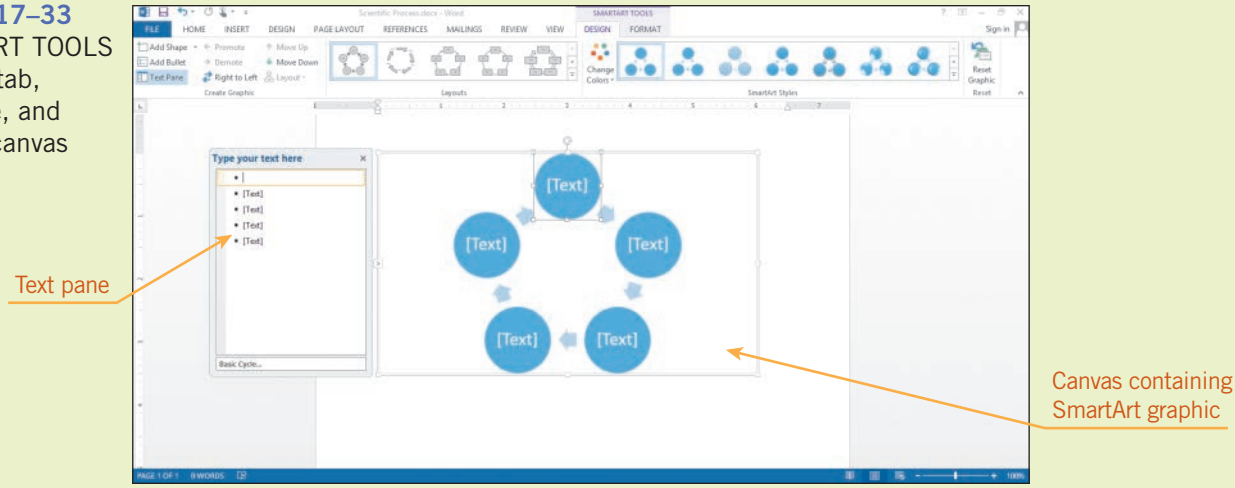


FIGURE 17–33
SMARTART TOOLS DESIGN tab, Text pane, and drawing canvas

6. Click the field placeholder text in the oval at the top of the canvas, and type **Ask a question**. As you enter the text, the font size adjusts so the text will fit within the oval object. Also, as you enter text in a field, the information in the Text pane is updated. You can choose to enter and edit data in the graphic or the Text pane.
7. Type the text for four more steps (going clockwise in the objects, or top to bottom in the Text pane):

   Form a hypothesis

   Design and conduct an experiment

   Analyze the results

   Draw a conclusion
8. Click the **Ask a question** circle object to select it. On the SMARTART TOOLS DESIGN tab, in the Create Graphic group, click the **Add Shape** button arrow, and then click **Add Shape**. A new circle object is inserted.
9. The insertion point is already positioned in both the new circle object and in the corresponding new bulleted text box in the Text pane. Type **Observe and gather data**. In the upper-right corner of the Text pane, click the **Close** button to close the Text pane.

10. You realize that the content you entered describes a process, not a cycle. The SmartArt graphic should already be selected. In the Layouts group, click the **More** button, and then click **More Layouts**. In the left pane, click **Process**. Scroll to the top of the center pane. In the seventh row, click the **Staggered Process** SmartArt graphic shown in **Figure 17–34**. Then click **OK**. The layout changes, but the content remains intact.

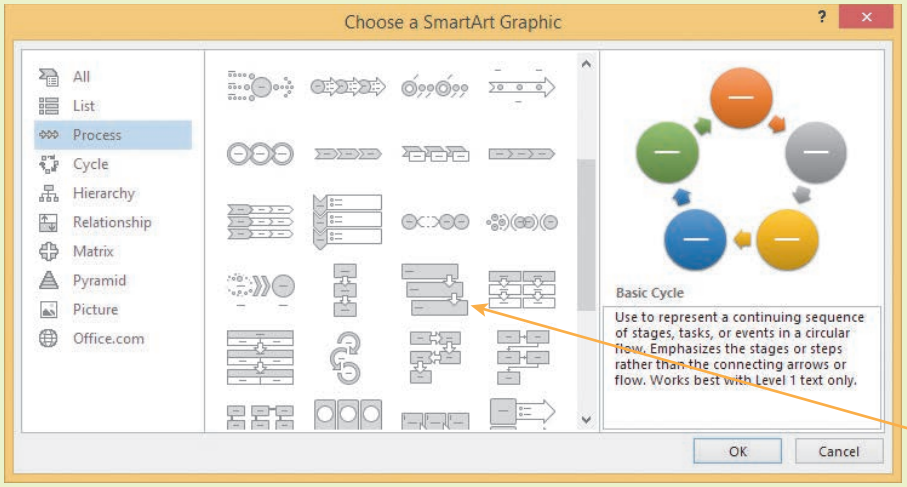


FIGURE 17–34
Process gallery in the Choose a SmartArt Graphic dialog box

11. The graphic should still be selected. In the SmartArt Styles group, click the **Change Colors** button. Roll the mouse pointer over the color options to see the Live Preview of the styles in the document window. A ScreenTip shows the name of each style. Under *Colorful*, click the first style, **Colorful - Accent Colors**. The colors of the rectangle objects and the arrow change.
12. With the graphic still selected, click the **Layout Options** button and then click **Square**. Now you can reposition the graphic on the page. Point to the *drawing canvas border*. When the pointer changes to a four-headed arrow, drag the **image** downward toward the center of the page so you can insert a heading above the graphic.
13. Position the insertion point outside the canvas at the top of the document, and type **SCIENTIFIC PROCESS**. Select the heading text without selecting the paragraph marker at the end of the text. Change the font size to **18 pt**. and center the paragraph.
14. Save the changes to the document and leave the document open for the next Step-by-Step.

Creating a Screenshot

You can use the Screenshot feature to capture a picture of all or part of the application window. For example, you can use the feature to capture the screen of another Word document or of a Web page that is open in a browser. Only windows that have not been minimized in the taskbar can be captured. The Screenshot feature is available in Microsoft Word, Excel, Outlook, and PowerPoint.

Step-by-Step 17.11

IC3
2-1.1.6
2-1.4.2

1. If necessary, open the **Scientific Process** file from your solution files. Change the zoom setting to **One Page**.
2. Close any other Word documents that are open. Then open a new blank document.
3. Click the **INSERT** tab. In the Illustrations group, click the **Screenshot** button. A menu displays a thumbnail of the Scientific Process document, as shown in **Figure 17–35**. Note that open documents from other applications, such as Internet Explorer, are also displayed as shown.

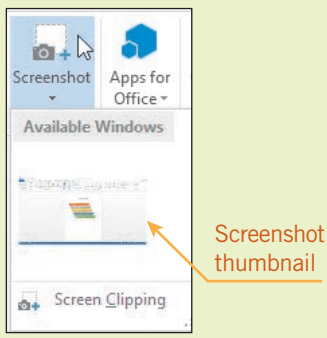


FIGURE 17–35
Screenshot menu

4. Click the **Scientific Process** document thumbnail. A picture of the Word screen with the Scientific Process document is inserted in the current document.
5. Click the **Layout Options** button and then click **Top and Bottom**.
6. Double-click in the white space about 2 inches below the screenshot.
7. Click the **INSERT** tab. Click the **Screenshot** button, and then click **Screen Clipping**. The Scientific Process document is displayed. When the image is dimmed, the mouse pointer changes to a crosshair.
8. Drag the mouse pointer across the dimmed image to create a border around the SmartArt graphic. When you release the mouse button, the new clipped screenshot is inserted at the location of the insertion point.
9. Click the **Layout Options** button for the new screenshot and then click **Top and Bottom**. Drag and drop the second image and center it below the first image.
10. Save the document as **SmartArt Screenshot**, followed by your initials. Then close both Word documents.

ETHICS IN TECHNOLOGY

Someone Owns the Rights

Web pages often display photos, and computers make it easy to copy and download those images. However, just because information is published on the Internet does not mean that the information is in the public domain and is free. Someone owns the rights to those pictures, and intellectual property law ensures that the owner of the picture is entitled to copyright protection. Before you download or copy images from the Internet, consider how you will use the image. For example, you can copy or download any clip art or photo in the Microsoft Office Clip Art and Media Library without permission and free of charge when you use the images in your own work. However, there are restrictions that prohibit you from selling the image in a product. If you are not sure about how you can use the image, check with the owner.

SUMMARY

In this lesson, you learned:

- Text can be arranged in a variety of multicolumn formats, all within the same document.
- Borders and shading are effective tools for enhancing the appearance and effectiveness of a document. You can choose from a variety of options for line styles, colors, and shading effects.
- Clip art and pictures help to enhance the appearance and effectiveness of a document.
- You can resize and crop graphics and you can choose from several options to position the graphic in the document.
- You can further enhance graphics by changing the colors, applying special effects, removing backgrounds, and adjusting the contrast and brightness.
- To add emphasis to your document, you can use the WordArt feature to make text decorative.
- You can create your own graphics using drawing tools, shapes, and text boxes.
- SmartArt graphics are useful in illustrating concepts and ideas.
- The screenshot feature enables you to capture a picture of all or part of the application window.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. A section break controls the section formatting of the text that follows it.

T F 2. When you recolor clip art or a photograph you must use colors in the current theme.

T F 3. To work with a graphic, you must select it.

T F 4. To drop a graphic anywhere within the printable area of the page, the text-wrapping format must be applied to a graphic.

T F 5. You can copy and paste lines, shapes, objects, and text boxes just like you copy and paste text and graphics.

MULTIPLE CHOICE

Select the best response for the following statements.

1. To format a picture to look like a sketch or a painting you can add a(n) _____.
   A. picture style
   B. artistic effect
   C. reflection effect
   D. none of the above
2. To control where text breaks from one column to the next, you can insert a _____ break.
   A. manual column
   B. section
   C. continuous
   D. text wrapping
3. When a graphic is positioned in the line of text, the graphic is positioned directly _____.
   A. at the end of the paragraph
   B. at the left margin
   C. at the position of the insertion point
   D. at the right margin
4. You can customize borders around _____.
   A. paragraphs
   B. pictures
   C. columns
   D. all of the above
5. When you _____ a graphic, you remove a part of the graphic that you do *not* want to show.
   A. clip
   B. crop
   C. outcrop
   D. scale

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. A(n) _____ is a predesigned drawing object.
2. The process of creating documents which combine text and graphics is called _____.
3. When you _____ a graphic, you add extra white space around the image.
4. _____ is a feature that enables you to transform text into a graphic.
5. A(n) _____ graphic is a built-in, predesigned, and formatted graphic layout designed to illustrate concepts and ideas.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is the purpose of dividing a document into multiple sections?

2. What are the benefits of formatting text to be displayed in multiple columns?

3. What happens when you resize a graphic by dragging one of the square sizing handles on the side of the graphic?

4. What Word features can you use to clarify elements in a picture and lighten or darken the picture?

5. What is the benefit of using the drawing canvas?

PROJECTS

PROJECT 17–1

2-1.2.1
2-1.4.1
2-1.4.2
2-2.2.1

1. Open the **Sundaes Menu** file from the drive and folder where your Data Files folder is stored. Save the Sundaes Menu document as **Revised Sundaes Menu**, followed by your initials.
2. Select the list below the heading *SUNDAES*. Do not include the blank paragraph above the next heading in the selection. Format the list in two columns of equal width with a vertical line between the columns.
3. Apply the same two-column format to the lists below each of the remaining banner headings: *MILK SHAKES, SPECIALTIES*, and *COFFEE DELIGHTS*.
4. Apply both borders and shading to the four banner headings. If desired, change the font style, color, and size.
5. Insert manual column breaks as needed so the title and description for the menu items are displayed in the same column.
6. Insert a WordArt graphic in the header pane. Choose a WordArt style, and enter the text **MENU**. Resize and position the WordArt graphic in the header pane. Change the text size, color, and add text effects as desired to create an attractive banner at the top of the document.
7. Save the changes, and close the document.

PROJECT 17–2

2-1.2.1
2-1.4.1
2-1.4.2

1. Open the **Roundabout Tours** file from the drive and folder where your Data Files folder is stored. Save the Roundabout Tours document as **Revised Roundabout Tours**, followed by your initials. Review the document to get familiar with the content.
2. Select the title **Roundabout Cycle Tours**. Click the **INSERT** tab. In the Text group, click the **WordArt** button to create a graphic using the selected text. Choose a WordArt style, and change the font colors and text effects as desired.
3. Format the WordArt graphic to wrap top and bottom, and resize the text box to center it between the left and right margins.
4. Insert the picture **Cycling.tif** from the drive and folder where your Data Files folder is stored.
5. Crop the extra white space around the image. Resize the image so the height is **2.5"**. Format the image so the text wraps around the object, and position the image as desired in the document.
6. Recolor the picture to match the WordArt object.
7. Save the changes, and close the document.

PROJECT 17–3

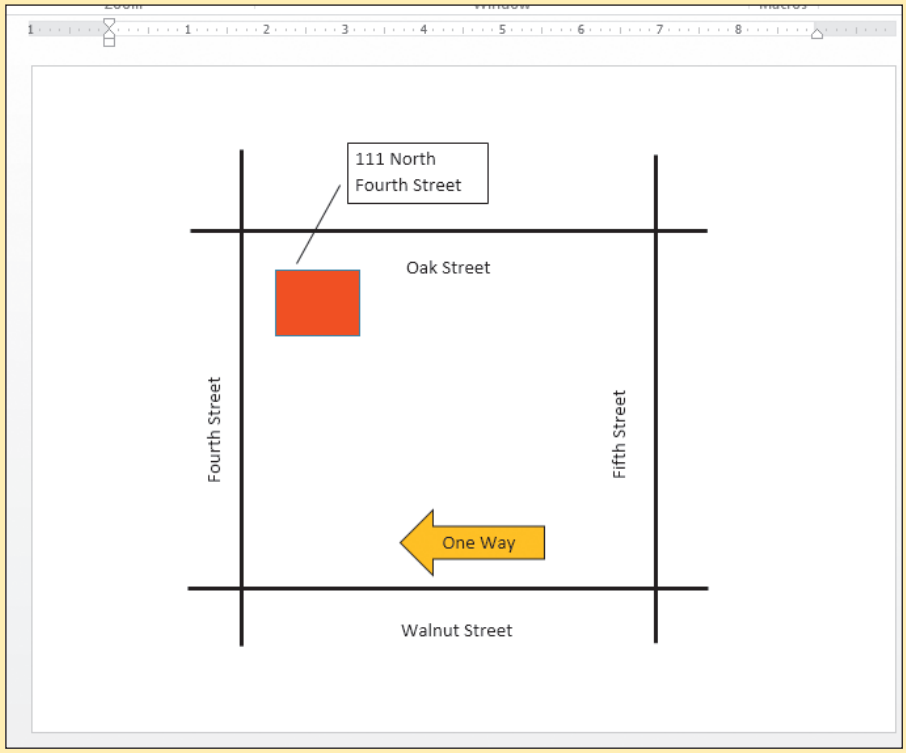
2-1.1.6
2-1.4.1
2-1.4.2

1. Open the **Gardening Tips** file from the drive and folder where your Data Files folder is stored. Save the Gardening Tips document as **Revised Gardening Tips**, followed by your initials.
2. Insert the picture file **Begonias.jpg** from the drive and folder where your Data Files folder is stored. Crop about **2.5** inches from the right side of the photo to remove the dark area in the image. Resize the picture so it is approximately **2** inches high.
3. Format the Begonias picture for text to wrap around the graphic, and then position the picture somewhere under the heading *Summer Maintenance*.
4. Insert the picture file **Garden.jpg**, which is stored in the drive and folder where your Data Files folder is stored. Resize the picture so it is approximately **1.75** inches high.
5. Format the Garden picture for text to wrap around the graphic, and then position the picture somewhere under the heading *Preparing for Spring*.
6. Insert the picture file **Lilies.jpg** from the drive and folder where your Data Files folder is stored. Resize the picture so it is approximately **1** inch high.
7. Remove the background from the Lilies picture. Readjust the removal marquee so all three lilies are fully displayed.
8. Position the Lilies picture on the left side of the document heading Format the Lilies picture layout so that it is behind the heading text, so the picture is part of the heading.
9. Save the changes and close the document.

PROJECT 17–4

2-1.1.6
2-1.2.1
2-1.4.1
2-1.4.2
2-2.2.1

1. Open a new blank document and save it as **Local Map**, followed by your initials. Change the page orientation to **landscape**.
2. Use the Line, Rectangle, and Shape tools to create the map objects shown in **Figure 17–36**. The Rulers on the edges of the screen are included in the figure to help you judge the size and position of the objects. The line weight for the lines representing the four streets is **3 pt**.
3. Format the color fills and borders on the rectangle and arrow objects as shown.
4. Use text boxes to label the street names and the street address. Increase the font size to **18 pt** for the text inside the text boxes. Resize the text boxes as necessary for the text to fit and rotate the text as shown in Figure 17–35. Remove the borders from the text boxes.
5. Save the changes, and close the document.



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FIGURE 17–36 Map for Project 17–4

PROJECT 17–5

2-1.2.1
2-1.4.1
2-1.4.2

1. Create a new blank document. Save the document as **Water Cycle**, followed by your initials.
2. Create a SmartArt object to illustrate the concept of the water cycle, using a SmartArt graphic of your choice. Enter four of the basic steps in the cycle.
   a. Condensation
   b. Precipitation
   c. Runoff
   d. Transpiration
3. Add an additional shape to the graphic, following *Transpiration* and then enter the text **Evaporation**.
4. Resize the graphic so that it fills the page.
5. If desired, change the diagram colors.
6. Save the changes and close the document.

TEAMWORK PROJECT

2-1.2.1

Choose a partner, and together gather samples of newsletters, brochures, and flyers. Compare and review the gathered content and list the strengths and weaknesses of the layouts and designs of each document. What elements and attributes are effective? What is ineffective? Share your samples with classmates and discuss the strengths and weaknesses of the layouts and designs.

CRITICAL THINKING

CRITICAL THINKING 17–1

2-2.2.1

If you completed Project 17–1, open the solution file **Revised Sundaes Menu**. Identify the total number of sections in the document. Check with a classmate to see if the two of you agree on the number of sections in the document.

CRITICAL THINKING 17–2

2-1.2.1
2-2.2.1

Creating an attractive layout and design for a document can draw attention and make a good first impression. However, even if the layout and design draw attention, if the content is not prepared accurately, the first impression might not be positive.

1. Create a new Word document and save the document as **CT 17–2**, followed by your initials.
2. Create a list of elements that have a negative effect when you review the content of a document.
3. It is a good choice to have someone else proofread your work for errors and provide feedback about the content, layout, and design. Share your list with a partner and ask that person to use your list as a guide for proofreading a document you have created for a class assignment.
4. Save the changes to the document and then close the document.

ONLINE DISCOVERY

In this lesson you worked with pictures saved in the JPEG format (*.jpg). Graphics such as photos and illustrations can be saved in several other formats including TIFF (*.tif), bitmap (*.bmp), and PNG (*.png). The resolution of the image and the size of the file depend on the file format. For example, JPEG images tend to be smaller files than TIFF images.

1. Search the Internet for information to learn more about the four file formats listed above.
2. Create a new Word document and save the document as **OD 17–1**, followed by your initials.
3. Create a list of the file types and explain the benefits of each file type.
4. Type a brief summary of when you would use each file format. Be sure to cite your Internet source(s).

2-1.1.8

5. Save the changes to the document and then close the document.

JOB SKILLS

In this lesson, you learned to use several Word features to enhance the appearance of a document. Put your knowledge into practice by designing a newsletter layout and design for your class, school, or workplace.

1. Create a new Word document and save the document as **JS 17–1**, followed by your initials.
2. Enter the following formula to create fake text. Type **=rand(4,7)**. (The number 4 in the equation refers to the number of paragraphs you want to create; the number 7 refers to the number of sentences in each paragraph. To alter the number of paragraphs and sentences, you can change the numbers in the parentheses.) Press **Enter**, and the random text is inserted in the document.
3. Design a layout for the newsletter content using the Word features introduced in this lesson, such as multiple columns, banners, borders, shading, and graphics.
4. Save the changes to the document and then close the document.

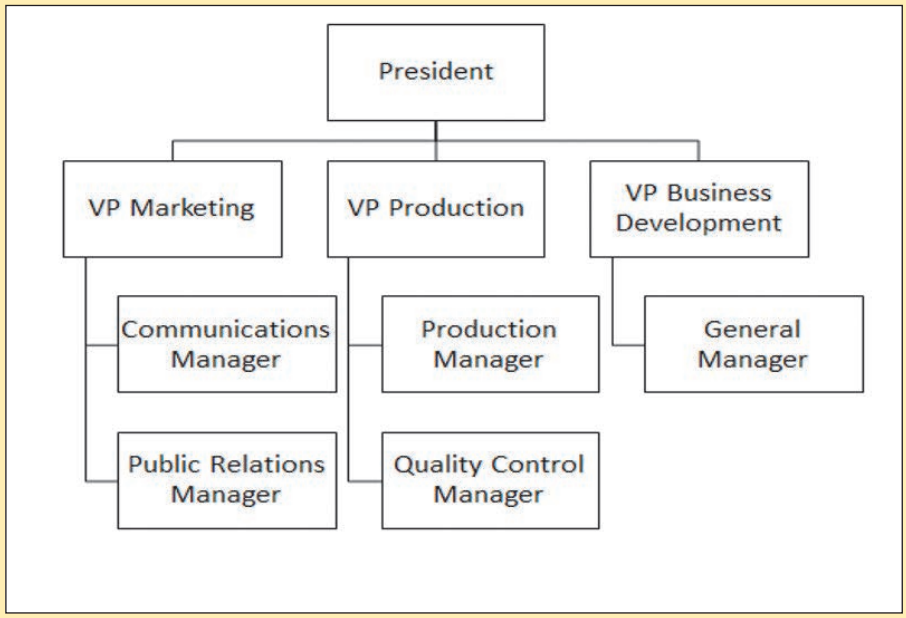
IC3 2-1.2.1 2-2.2.1

EXPLORE AND SOLVE

In this lesson you learned to create SmartArt objects. The SmartArt Hierarchy templates are very useful for creating organization charts. Explore how to add shapes before and below and promote and demote objects in a SmartArt organizational chart.

1. Create a new blank document. Save the document as **ES 17–1**, followed by your initials. Change the page orientation to **landscape**.
2. Create a SmartArt graphic for an organizational chart that shows the hierarchy of the management positions in an organization, using a SmartArt graphic of your choice.
3. Enter the information provided in **Figure 17–37**, and add shapes and promote or demote as necessary to match the proper hierarchy.
4. Modify the SmartArt formats as desired.
5. Save the changes to the document, and then close the document.

IC3 2-1.2.1 2-1.4.2 2-2.2.1



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FIGURE 17–37 Data for Explore and Solve



Estimated Time:
1.5 hours

LESSON 18

Getting Started with Excel Essentials

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Identify the parts of the Excel screen.
- Navigate through a worksheet and a workbook.
- Change views and magnification in the worksheet window.
- Use the AutoCorrect and AutoComplete features when entering data.
- Insert and delete rows, and change column width and row height.
- Copy, clear, move, and delete data.
- Use the Undo and Redo features.
- Use the AutoFill feature to copy and enter data into a range of cells.

WORDS TO KNOW

active cell
AutoFill
cell
cell reference
column heading
range
row heading
spreadsheet
value
workbook
worksheet

DATA FILES

To complete this lesson, you will need these data files:

Purchase Orders.xlsx
Salaries.xlsx

Microsoft product screenshots used with permission from Microsoft Corporation.

VOCABULARY
spreadsheet
worksheet
workbook

For hundreds of years, accountants have used spreadsheets to gather, organize, and summarize text and numeric data. A ***spreadsheet*** is a grid of rows and columns into which you enter text data (e.g., surnames, cities, and states) and numerical data (e.g., dates, currency, and percentages). Each time one piece of data was changed, paper spreadsheets had to be manually recalculated, which was painstaking and time consuming.

Excel is an electronic application designed to replace the paper spreadsheet. Excel enables you to work with text, numbers, and formulas to create worksheets, tables, charts, and statistical analysis. When using an electronic spreadsheet, data changes are relatively easy and require far less time. Excel is especially useful when you need to organize and maintain large amounts of data.

Touchscreen Users

The instructions in the Excel lessons generally provide directions for using a mouse to access commands and features, such as *point, click, double-click*. If you are using a touch screen, you can use gestures, such as *press, tap, slide, swipe*, and *drag* instead of following the directions for using the mouse.

Identifying the Parts of the Excel Screen

Excel 2013 refers to a spreadsheet as a ***worksheet***. The worksheet is always stored in a ***workbook*** that contains one or more worksheets. When working with large amounts of data, you can organize the data in multiple worksheets and still save all the data in one workbook. In addition, you can have multiple Excel workbooks open at the same time.

The Excel worksheet is divided into columns and rows. Columns of the worksheet appear vertically and are identified by letters at the top of the worksheet window. Rows appear horizontally and are identified by numbers on the left side of the worksheet window. Usually, the top row of a worksheet is used for explanatory text or headings that identify the type of data in each column.

Excel uses the Microsoft Office Fluent user interface you learned about in Lesson 11, with a Ribbon with contextual tabs that adapt to provide the tools and commands for specific tasks. To maximize the screen space for your worksheet window, you can easily minimize the Ribbon. You will also recognize the Quick Access Toolbar.

Step-by-Step 18.1

IC3
2-1.1.7
2-1.3.3
2-1.3.4

QUICK TIP

If you are using Windows 7 or Vista, click the Start button, click All Programs, click Microsoft Office 2013, and then click Excel 2013.

1. Open the Start screen. If necessary, scroll through the Start screen tiles and click the **Excel 2013** application tile. Recently accessed documents appear in the pane on the left, and templates for creating new documents appear in the template gallery on the right.
2. In the template gallery, click the **Blank workbook** thumbnail. Compare your screen with **Figure 18–1**. The callouts in the figure will help you identify parts of the window when they are referenced in the following steps.

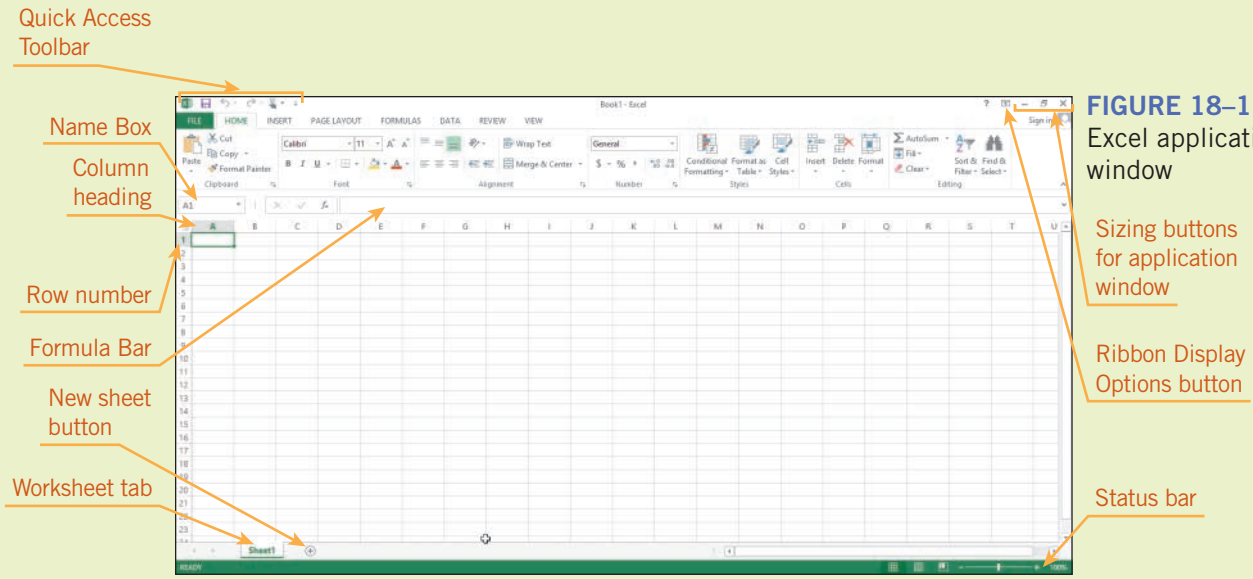


FIGURE 18–1
Excel application window

3. Note the various components of the Excel screen and their names. A new workbook titled *Book1* is opened. The Ribbon is similar to the Ribbon that appears in Word. Some of the tabs and buttons are the same, but there are also some different tabs and many new buttons. *Sheet1* appears in the worksheet window.
4. Move the mouse pointer over the *cells* in the worksheet window. When the mouse pointer is within the worksheet cells, it changes to the white plus sign .
5. Position the mouse pointer over the *Ribbon*. The pointer changes to the normal pointer .
6. Position the mouse pointer over the *Formula Bar*. The pointer changes to an I-beam .
7. If necessary, click the **Maximize** button on the title bar so that the workbook fills the screen. Click the **Minimize** button . The application window is minimized. In the taskbar, click the **Microsoft Excel** application button to restore the application window.
8. On the title bar, click the **Restore Down** button . The application window is reduced in size.

9. Drag the **Book1** title bar to move the worksheet window around on the screen.
10. On the title bar, click the **Maximize** button to maximize the application window. Note the number of rows that are displayed in the worksheet window.
11. On the title bar, click the **Ribbon Display Options** button. In the menu, click **Auto-hide Ribbon**. Note that the Ribbon no longer appears and more rows show in the worksheet.
12. Click the **Ribbon Display Options** button, and then click **Show Tabs**. The Ribbon tabs show, but there are no commands on the Ribbon. Click any one of the tabs to show the commands.
13. Click the **Ribbon Display Options** button and then click **Show Tabs and Commands** to restore the Ribbon to the default settings.
14. Leave Excel open for the next Step-by-Step.

QUICK TIP

You can also minimize the Ribbon by double-clicking any one of the Ribbon tabs. To expand the Ribbon, double-click any one of the tabs.

Navigating a Workbook

VOCABULARY

cell

cell reference

active cell

A useful workbook has data organized logically in the cells. A ***cell*** is the intersection of a single row and a single column. The ***cell reference*** is the column letter followed by the row number (for example, A1 or B4). Before you can enter data into a cell, you must first select the cell. When the cell is selected, a green border appears around the cell, and the column and row headings for the selected cell are shaded with a grey background. You can select a cell using either the mouse, the keyboard, or the touchscreen. When a cell is selected, it is called the ***active cell***. The active cell is identified in the Name Box at the top of the worksheet window.

To be useful, the rows and columns in the worksheets must be labeled effectively so you can easily find and identify the data. To move around in a worksheet, you can use the mouse, the touchscreen, the scroll bar features, or the keyboard. Many of the keyboard shortcuts you learned to use in Word move the insertion point in Excel in similar ways. For example, the arrow keys move the insertion point to an adjacent cell in any direction, and Page Up or Page Down moves the insertion point up or down one screen at a time. **Table 18–1** includes other keyboard shortcuts you can use to move the insertion point in an Excel worksheet.

TABLE 18–1 Keyboard shortcuts for moving the insertion point in Excel

TO MOVE THE INSERTION POINT	PRESS
Right one cell	Right arrow or Tab
Left one cell	Left arrow or Shift+Tab
To the next row	Down arrow
To the previous row	Up arrow
To the first cell in a row	Home
To the beginning of the worksheet	Ctrl+Home
To the last column and row with data in the worksheet	Ctrl+End
To the next screen	Page Down
To the previous screen	Page Up
To a specific cell	F5 (and then enter the cell reference in the Go To dialog box)

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Step-by-Step 18.2

IC3
2-1.1.1
2-1.1.9
2-1.3.1
2-1.3.2
2-1.3.5

1. Click the **FILE** tab to open Backstage view, and then click **Open**. Click **Computer** and then click **Browse**. Then navigate to the drive and folder where your Data Files folder is stored. Select the filename **Salaries**, and click **Open**.
2. Click the **FILE** tab, and then click **Save As**. Navigate to the drive and folder where you save your solution files. In the File name box, type the new filename **Updated Salaries**, followed by your initials. Click **Save**.

3. Cell A1 is the active cell, as shown in **Figure 18–2**. Notice the cell reference A1 is displayed in the Name Box, and the contents of the cell are displayed in the Formula Bar. Click cell **A5** to select it. The Name Box now shows the cell reference *A5*, and the Formula Bar shows the contents for cell A5.

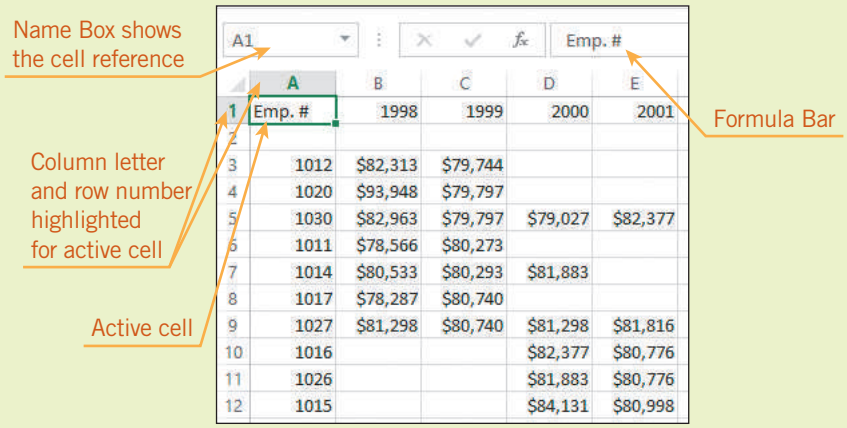


FIGURE 18–2
An active cell in a worksheet

4. Press **Tab** three times to move to cell D5. Then, press **Home** to move to the beginning of the row. Cell A5 is the active cell.
5. Press the **up arrow** to move to cell A4. When you use Tab or an arrow key, the active cell moves to the new location.
6. On the HOME tab, in the Editing group shown in **Figure 18–3**, click the **Find & Select** button, and then click **Go To**.

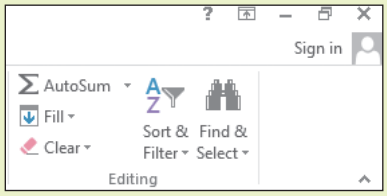


FIGURE 18–3
Editing group on the HOME tab

7. The Go To dialog box opens. Under *Reference*, type **p76**, and click **OK** to move to cell P76, which is now the active cell as shown in **Figure 18–4**.

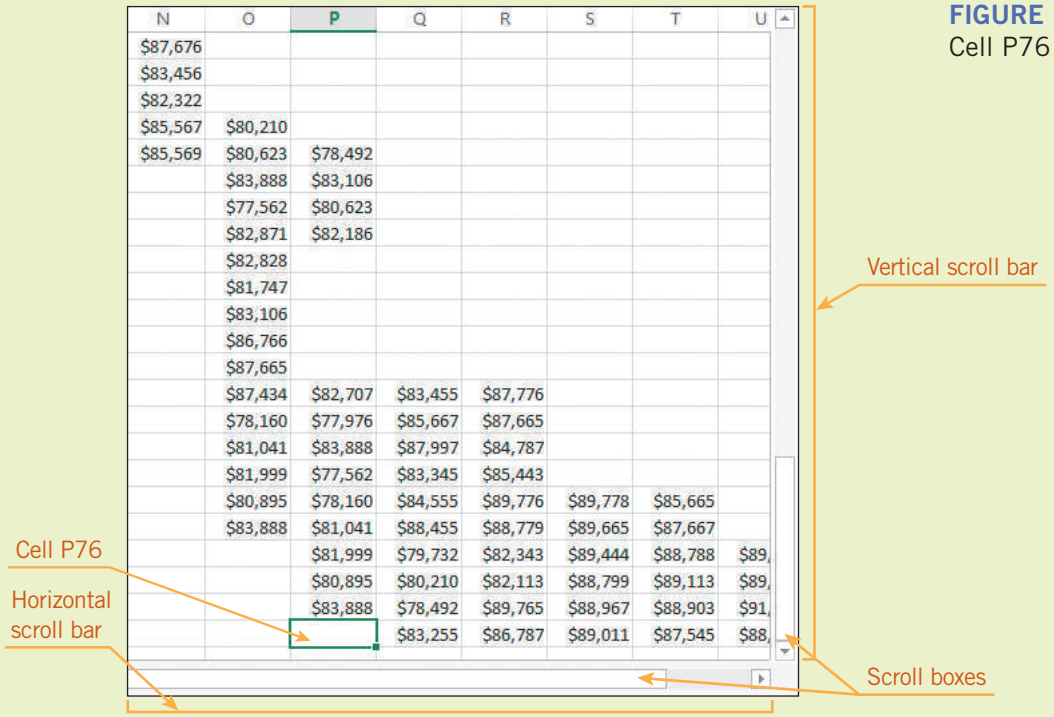


FIGURE 18–4
Cell P76 selected

8. On the horizontal scroll bar, drag the **scroll box** to the right so you can see the last cell with data, cell W76. Then click the **scroll up arrow** on the vertical scroll bar to move up one row. The scroll bar changes the view on the screen, but it does not change the active cell.
9. Click above the scroll box on the vertical scroll bar to move up one screen, and then click below the scroll box to move down one screen. Click to the left side of the scroll box on the horizontal scroll bar to move one screen to the left, and then click to the right of the scroll box to move one screen to the right.
10. Press the **Up arrow** key two times. The active cell is P74.
11. Press **Tab** two times. The active cell is now R74. Press the **Left arrow** key to select cell Q74.
12. Press and hold **Ctrl** and then press **End** to move to the last cell with data in the worksheet. The active cell is now cell W76.
13. To navigate back to the beginning of the document, press and hold **Ctrl** and then press **Home**. The active cell is now cell A1.
14. Leave the workbook open for the next Step-by-Step.

Changing the Workbook View and Magnification

Excel offers several options for viewing a workbook. You can change the view by selecting options from the Workbook Views group on the VIEW tab or by clicking one of the view buttons in the status bar in the lower-right corner of the worksheet window. You can also change the zoom settings to adjust the view on the screen.

Step-by-Step 18.3

IC3
2-1.1.4
2-1.3.1
2-1.3.6

1. If necessary, open the **Updated Salaries** file from your solution files.
2. Click the **VIEW** tab. The view commands are in the Workbook Views group, shown in **Figure 18–5**. The current view is Normal, which is the default view.

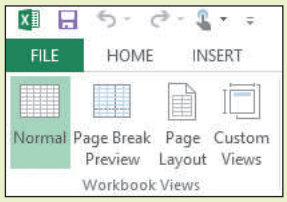


FIGURE 18–5
Workbook Views group on the VIEW tab

3. Click the **Page Layout** button. The view changes, and the column and row labels are separated from the worksheet cells because these labels will not appear in a printed worksheet. You can see the white margins that will appear when the worksheet is printed.
4. Click the **Page Break Preview** button. Scroll down and you see that the worksheet will print on six pages. You will learn more about working with the Page Break Preview in Lesson 19.
5. Click the **Normal** button to return to the default view.
6. On the status bar, click the **Page Layout** view button, shown in **Figure 18–6**, to display the worksheet as it will be printed.

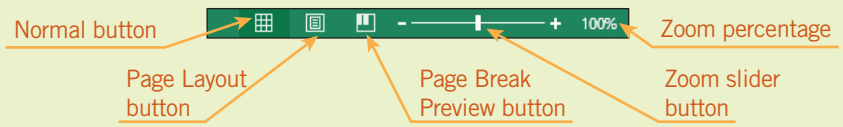


FIGURE 18–6
View buttons and zoom settings on the status bar

7. On the status bar, click the **Page Break Preview** view button to show the page breaks.

8. On the status bar, click the **Normal** view button to return to the default view.
9. On the VIEW tab, in the Zoom group shown in **Figure 18–7**, click the **Zoom** button. The Zoom dialog box opens. Click **25%**, and then click **OK**. You can see all the page breaks.

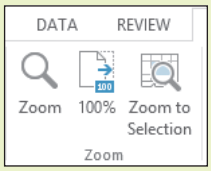


FIGURE 18–7
Zoom group on the VIEW tab

10. On the status bar in the lower-right corner of the screen, as shown in Figure 18–6, drag the **Zoom slider** button to the right to change the zoom setting to approximately **50%**.
11. In the Zoom group, click the **100%** button.
12. Click the **FILE** tab, and then click **Close**. If prompted to save changes, click **Don't Save**.
13. In the upper-right corner of the application window, click the **Close** button to close the application.

ABOVE AND BEYOND

If you have a mouse with a wheel, you can also change the zoom settings by using the wheel. To increase the magnification, hold Ctrl and roll the wheel away from you. To decrease the magnification, hold Ctrl and roll the wheel toward you.

Entering Data

You add data to the cells by entering text or a number in the active cell. The text or number is often referred to as a ***value***.

VOCABULARY
value

Inserting Data

To enter data in a cell, the cell must be active. As you begin entering text, you see the insertion point indicating where the next character of text will appear. By default, Excel shows approximately eight characters in each cell. When text is too long for the width of a cell, it spills over into the next cell if the next cell is empty. If the next cell is not empty, the text that does not fit into the cell is not displayed, but it is still contained within the cell. When you enter more numbers than can fit in the cell, a series of number signs (####) is displayed in the cell.

Step-by-Step 18.4

IC3
2-1.1.9
2-1.3.2
2-1.3.3
2-3.1.3

1. Launch Excel and create a new blank workbook. Save the new workbook as **Vacations 1**, followed by your initials.
2. The active cell should be A1. Type **Days**. Notice the text you enter is displayed in both the cell and the Formula Bar. As new content is entered, the Formula Bar adapts and shows the three buttons shown in **Figure 18–8**. You will use these buttons in a later step to edit the cell contents.

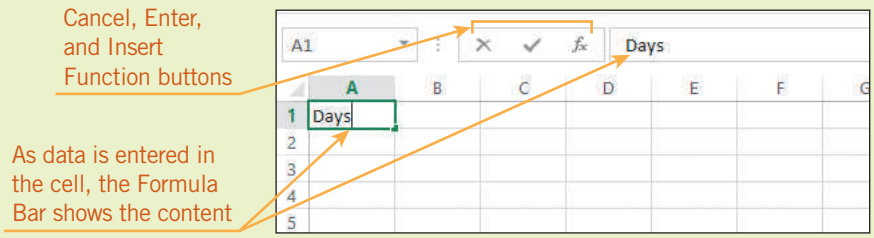


FIGURE 18–8
Formula Bar with data entered in the cell

3. Press **Tab**. B1, the next cell to the right in the first row, is now the active cell. Type **Depart**, and then press **Enter**. The active cell is now A2, the first cell in the second row. Note that the default setting aligns text at the left border of the cell.
4. Click cell **C1**, type **Arrive**, and then press **Tab**.
5. Type **Cruise**, and then press **Enter**. The active cell is now C2.
6. Click cell **A1** to select it. *Days* shows in the cell and in the Formula Bar. To change the text in the Formula Bar, position the insertion point in front of the word *Days* in the Formula Bar. Type **Number of**, and then press the **spacebar**. On the Formula Bar, click the **Enter** button ✓. The change is made in the Formula Bar and in cell A1. (The Enter button in the Formula Bar only enters the data in the cell. It does not allow for the automatic movement to A2.)
7. Double-click cell **A1**. When the insertion point appears, delete **Number of**, and then type **#**. The edit is made in cell A1 and in the Formula Bar. Press **Tab** to complete the entry.
8. Press the **right arrow** two times to move to cell D1. The cell currently shows *Cruise*. Type **Destination**, and press **Enter**. The contents of the cell are replaced with the new text you entered, and the cell below, D2, becomes active. Also notice that the new content expands beyond the border of the D column. You will fix that later.
9. Click cell **C1**. It currently shows *Arrive*. Press **F2**. Notice that the insertion point is now positioned at the end of the text in the cell.
10. Press **Backspace** twice to delete two characters from the existing text. Press **Enter**.

QUICK TIP

If you choose not to keep the data you have entered, before moving to another cell, you can delete the data by pressing Esc or clicking the Cancel button in the Formula Bar.

11. Right-click cell **C1**, and in the shortcut menu, click **Clear Contents** to remove all the characters.
12. Type **Return** and then press **Enter**. The new text you entered now displays in the cell, and the cell below, C2, becomes the active cell.
13. Click cell **A2**. Enter the following numbers, pressing **Enter** after each number. When you are done, your worksheet should look like the one shown in **Figure 18–9**. The default setting aligns numbers at the right border of the cell.

    4

    5

    7

    10

    7

QUICK TIP

To edit cell data using a Touchscreen, double-tap the cell. To delete contents from a cell using a Touchscreen, tap the cell to select it. Then tap the cell again to show the Mini toolbar. On the Mini toolbar, tap Clear.

	A	B	C	D	E	F
1	# Days	Depart	Return	Destination		
2	4					
3	5					
4	7					
5	10					
6	7					
7						
8						
9						
10						

FIGURE 18–9
Worksheet with data

14. On the Quick Access Toolbar, click the **Save** button. Leave the workbook open for the next Step-by-Step.

Using the AutoCorrect and AutoComplete Features

Obviously, to get accurate results, you must enter worksheet data accurately. The AutoCorrect feature in Excel corrects common mistakes as you enter data. For example, if you type *hte*, Excel will automatically change the text to *the*. The AutoComplete feature can save you time and ensure consistency in the data you enter. Excel compares the first few characters you enter in a cell to existing entries in the same column. If the characters match an existing cell entry, Excel proposes the existing entry. You can press Enter to accept the proposed entry, or you can continue entering new text.

Step-by-Step 18.5

1. If necessary, open the **Vacations 1** file from your solution files. Save the Vacations 1 workbook as **Vacations 2**, followed by your initials.
2. Click cell **D2**. Type **Caribbean**, and press **Enter**.
3. In cell D3, type **Bahamas and Florida**, and press **Enter**. The contents overlap the right border of the column. The active cell is D4.

IC3
2-1.1.5
2-1.1.9
2-1.3.2

4. Type **C**. Notice that Excel suggests *Caribbean* because you entered it earlier in the column. Press **Enter** to accept the proposed text.
5. Type **Alaska**, and press **Enter**.
6. Type **Belize adn**. Then look at the active cell as you press the **spacebar**. Excel automatically corrects the spelling and changes *adn* to *and*.
7. Type **Cozumel**, and press **Enter**.
8. Save the changes, and leave the workbook open for the next Step-by-Step.

Modifying the Worksheet Structure

Just as you can change a Word table structure, you can change the structure of a worksheet by adding or deleting rows and columns.

Selecting Multiple Cells in the Worksheet

VOCABULARY
row heading
column heading
range

To select an entire row in a worksheet, click the ***row heading***, which is the number at the left of the row. To select an entire column, click the ***column heading***, which is the letter at the top of the column. You can also select a row, column, or section of a worksheet by clicking and dragging the mouse to highlight the area you want to select. When you select a group of cells, the group is called a ***range***. All cells in a range touch each other and form a rectangle. The range is identified by the cell references of the cell in the upper-left corner and the cell in the lower-right corner, separated by a colon (for example, A1:D4).

Step-by-Step 18.6

IC3
2-1.1.9
2-1.3.2
2-3.1.4

1. If necessary, open the **Vacations 2** file from your solution files. Save the Vacations 2 workbook as **Vacations 3**, followed by your initials.
2. Click the column **B** heading to select the second column. The column has a green border, and all the cells in the column are shaded except for the first cell. The lack of shading indicates the first cell is the active cell, as shown in **Figure 18–10**.

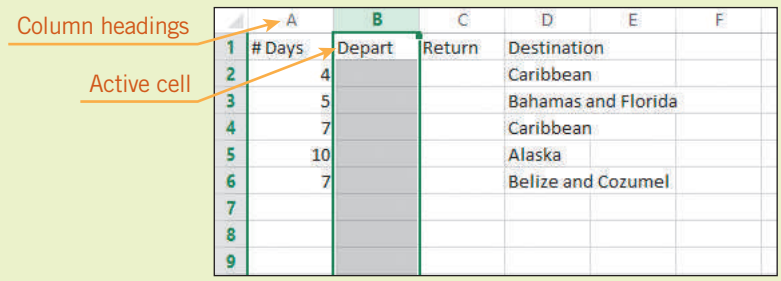


FIGURE 18–10
Selected column

3. Click the row **4** heading to select the fourth row. The entire row has a green border, and the row number and all the cells in the row are shaded, except for the first cell, A4, which is the active cell.
4. Type **8** and press **Enter**. Notice that this new data replaces the data in the active cell, A4. When you enter data in a selected row or column, the data is entered in the first cell.
5. Point to cell *A1*, and then click and drag the mouse pointer to the right and down to select the range **A1:D6**. Even though some of the content in column D extends beyond the cell borders, as shown in **Figure 18–11**, all of the content is selected.

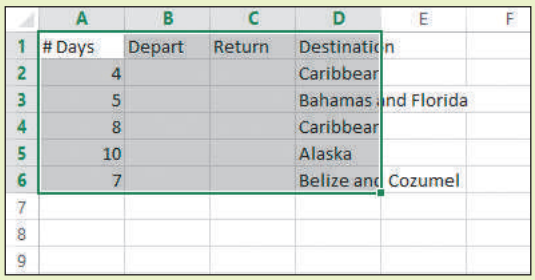


FIGURE 18–11
Selected range of cells

6. Click elsewhere in the worksheet to deselect the range. Click cell **A1**. Hold down **Shift** and click cell **D6**. All cells between A1 and D6 are selected. Click elsewhere in the worksheet to deselect the range.
7. Click cell **A1**. Press and hold down **Shift**, and use the right and down arrow keys to select the range **AI:D6**. Click elsewhere in the worksheet to deselect the range.
8. Click cell **D2**. Press and hold **Ctrl** and then click cell **D4**. The nonadjacent cells are selected. Click elsewhere in the worksheet to deselect the cells.
9. Click the row **2** heading. Press and hold **Ctrl** and then click the row **4** heading. The nonadjacent rows are selected. Click elsewhere in the worksheet to deselect the rows.
10. Save the changes, and leave the workbook open for the next Step-by-Step.

QUICK TIP

Instead of holding down the Shift key to select a range of cells, you can press F8 and then press the arrow keys to select the cells. The F8 key enables the Select mode. To turn off the Select mode, press F8 again, or press Esc.

Inserting and Deleting Rows and Columns

When you insert or delete a row or a column in Excel, it affects the entire worksheet. All existing data is shifted in some direction. For example, when you add a new column, the existing data shifts to the right; when you add a new row, the data shifts down a row. To add or delete rows and columns, use the buttons in the Cells group on the HOME tab. To insert or delete multiple columns and rows in a single step, select the desired number of columns or rows before executing the command.

Step-by-Step 18.7

IC3
2-1.1.5
2-1.1.9
2-1.3.2
2-3.1.1
2-3.1.4

1. If necessary, open the **Vacations 3** file from your solution files. Save the Vacations 3 workbook as **Vacations 4**, followed by your initials. If necessary, click the **HOME** tab.
2. Click any cell in column **D**. In the Cells group on the HOME tab, shown in **Figure 18–12**, click the **Insert** button arrow, and then click **Insert Sheet Columns**. A new column is inserted to the left of column D, and the data that was labeled as column *D* is now labeled as column *E*.

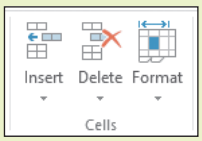


FIGURE 18–12
Cells group on the HOME tab

ABOVE AND BEYOND

If the data in one cell is dependent on the data in another cell, when these cells are adjusted, Excel will keep straight what information is required where. You will learn more about this in Lesson 20.

3. Click cell **D1**, and type the column heading **Agent**. Press **Enter**, and then type the following list of travel agent initials in cells D2 through D6. Use Excel's AutoComplete feature to complete repeated entries, and remember to press **Enter** after each entry to move to the next cell in the column.

   JRK

   AMF

   JRK

   AMF

   AMF
4. Click cell **C4**. In the Cells group, click the **Delete** button arrow, and then click **Delete Sheet Columns**. The column with the label *Return* is deleted from the worksheet. The content that was in column D and column E is now in column C and column D. If you had selected multiple columns before clicking the Delete Sheet Columns option, all the selected columns would have been deleted.
5. Click any cell in row **6**. In the Cells group, click the **Insert** button arrow, and then click **Insert Sheet Rows**. A new row is inserted above the row with the active cell, and row 6 becomes row 7. The existing data shifts down, and the row labels are updated to reflect the change.
6. Click cell **A6**, and type **10**. Click cell **C6**, and type **JRK**. Click cell **D6**, type **Panama Canal**, and press **Enter**.
7. Point to the row *6* heading. When the mouse pointer changes to a right arrow, click and drag down to select rows **6** and **7**.
8. With rows 6 and 7 both selected, in the Cells group, click the **Insert** button. Because whole rows were already selected, you did not need to click the button arrow to select the option to insert sheet rows. Because two rows are selected, two new rows are inserted above the selected rows.

QUICK TIP

You can also insert and delete rows and columns using the shortcut menu. Select the rows/columns, right-click the selection, then click Insert or Delete. You can also right-click in a row or cell and click Insert or Delete. The Insert or Delete dialog box will open and you can choose to shift cells or add or delete an entire row or column.

9. Enter the following information in columns A, C, and D of the new rows:

   14 AMF Mediterranean

   10 JRK Caribbean

10. Click the row **9** heading to select the entire row. In the Cells group, click the **Delete** button. Because you selected the entire row, you did not need to click the button arrow to delete the entire row.
11. On the Quick Access Toolbar, click the **Undo** button. Deselect the cells.
12. Save the changes, and leave the workbook open for the next Step-by-Step.

ABOVE AND BEYOND

To add the Repeat command to the Quick Access Toolbar, click the Customize Quick Access Toolbar button, and then click More Commands. Under Separator, click Repeat, click Add, and then click OK.

Changing Column Width and Row Height

As you already learned, sometimes the data you enter in a cell does not fit in the column. To accommodate the data, you can widen the column and change the height of a row. The default column width is 8.43 characters with the default text font. The default row height is 15.00.There are several options available for changing the cell width and height.

Step-by-Step 18.8

IC3
2-1.1.9
2-1.3.2
2-3.1.2
2-3.1.4

1. If necessary, open the **Vacations 4** file from your solution files. Save the Vacations 4 workbook as **Vacations 5**, followed by your initials.
2. Select cell **A1**.
3. Point to the *boundary* on the right side of the column *B* heading. When the pointer changes to a double-headed arrow ↔, as shown in **Figure 18–13**, click and drag the **boundary** to the right. As you drag the boundary, the exact column width appears in a ScreenTip. Release the mouse button when the column width is exactly 11.00 (82 pixels) as shown in Figure 18–13.

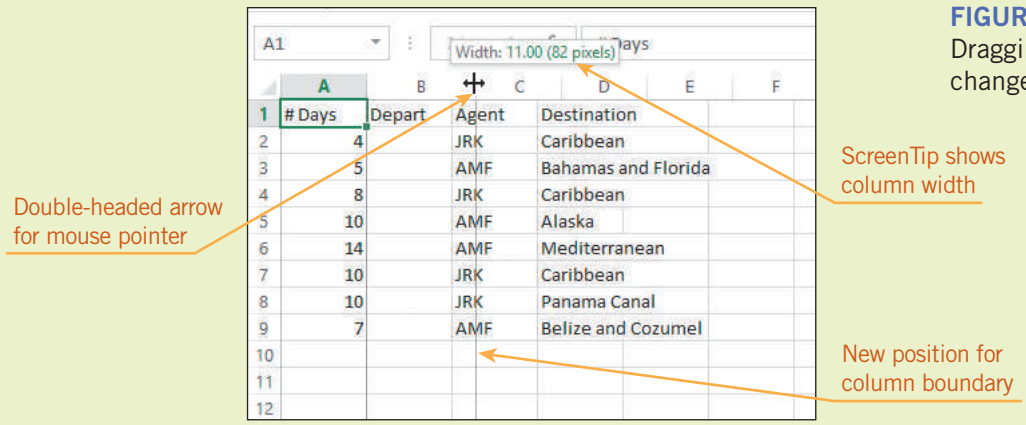


FIGURE 18–13
Dragging a column boundary to change the column width

4. Click the column **D** heading to select the entire column. In the Cells group, click the **Format** button, and then click **Column Width**. The Column Width dialog box opens.
5. In the Column width text box, the current width is already selected. Type **25** and click **OK**. The column width is adjusted.
6. Column D should still be selected. In the Cells group, click the **Format** button, and then click **AutoFit Column Width**. The column width is automatically adjusted to fit the cell with the most content—in this case, cell D3 with the content *Bahamas and Florida*.
7. Point to the column *A* heading, and then click and drag across the headings to include columns **B** and **C** in the selection.
8. With the three columns selected, position the mouse pointer over the right boundary on the column *C* heading. When the pointer changes to a double-headed arrow, double-click. The width of each of the three columns is automatically adjusted to fit the contents in that column.
9. Click the row **1** heading to select the entire row.
10. In the Cells group, click the **Format** button, and then click **Row Height**. The Row Height dialog box opens. Change the row height setting to **25**, and then click **OK**.
11. Click anywhere in the worksheet to deselect the row. Note the change in row 1. The row is now about twice as high as the other rows.
12. Save the changes, and leave the workbook open for the next Step-by-Step.

Editing the Worksheet Data

Sometimes after entering data in a worksheet, you need to reorganize it. You may even want to remove some of the data and not replace it. Or, you may want to move or copy existing data from one location to another.

Clearing, Replacing, and Copying Existing Data

You learned in Step-by-Step 18.4 that you can edit the data directly in the cell, or you can make the necessary changes to the cell contents in the Formula Bar. To replace cell contents, you can select the cell and enter the new data. The process for deleting data can be as simple as pressing Delete or Backspace. Using these keys, you can clear the cell contents.

Copying data saves you from having to enter the same data into another location. The process, as in all Office applications, is easy. Moving data is similar to copying data, except that you cut the data from one location and paste it in a new location. You can copy or move multiple cells of data at the same time. However, unlike copying or moving data in a Word table, when you paste data to a spreadsheet cell that already contains data, that existing data does not move to make room for the new data. Instead, the existing data in the destination cell is replaced with the pasted data. If you do not want to lose content, you need to copy or move data into empty cells.

Step-by-Step 18.9

1. If necessary, open the **Vacations 5** file from your solution files. Save the Vacations 5 workbook as **Vacations 6**, followed by your initials.
2. Click cell **A6**. The cell currently shows *14*. Press **Delete** to remove the contents. With cell A6 still selected, type **10** and press **Enter**.
3. If necessary, click the **HOME** tab. Click cell **A6**. In the Cells group, click the **Delete** button arrow, and then click **Delete Cells**. The Delete dialog box shown in **Figure 18–14** opens. If necessary, click the **Shift cells up** option. Click **OK**. The contents in cells A7 and A8 are shifted one cell up, and cell A9 is now empty. Cell A6 is the active cell.

IC3
2-1.1.2
2-1.1.5
2-1.1.9
2-1.3.2
2-3.1.2
2-3.1.4

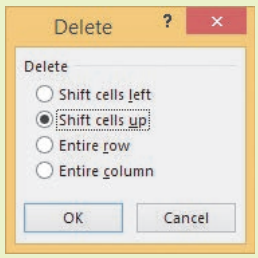


FIGURE 18–14
Delete dialog box

4. With cell A6 still the active cell, click the **Insert** button arrow, and then click **Insert Cells**. If necessary, click the **Shift cells down** option. Click **OK**. The contents in cells A6 through A8 are each shifted down one cell, and now cell A6 is empty. Type **14**, and press **Enter**.
5. Click cell **D4**. In the Clipboard group on the HOME tab, shown in **Figure 18–15**, click the **Copy** button. The contents of the cell *(Caribbean)* are copied to the Clipboard. Also, an animated border (a dotted-line marquee) appears around the selected cell, as shown in **Figure 18–16**.

WARNING

Use caution when using the Shift cells feature. The results may misalign data in your rows and columns.

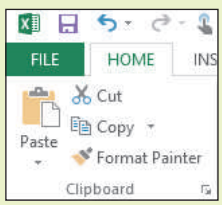


FIGURE 18–15
Clipboard group on the HOME tab

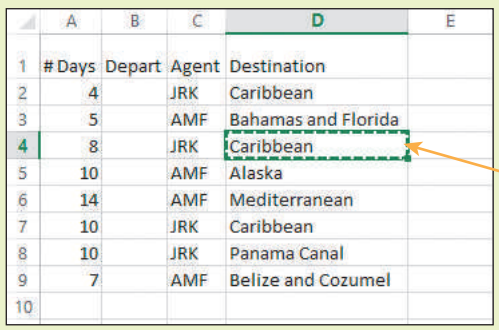


FIGURE 18–16
Marquee around a selected cell

QUICK TIP

To view the objects on the Clipboard, in the Clipboard group click the dialog box launcher to display the Clipboard task pane. However, the Clipboard task pane does not need to be open when you copy and paste data.

QUICK TIP

If you have a touch screen, you can enable the Touch mode command on the Quick Access Toolbar. The Ribbon will increase in height to allow you more space to touch the commands.

6. Click cell **D9**. In the Clipboard group, click the **Paste** button. (Be sure to click the Paste button and not the Paste button arrow.) The copied data is pasted in the destination cell.
7. On the Quick Access Toolbar, click the **Undo** button to undo the Paste action. Click the **Redo** button to reverse the action. Then click the **Undo** button again.
8. The marquee is still displayed around cell D4 to indicate that you can still paste the copied data in other locations. Press **Esc** to remove the marquee around the copied cell.
9. Click cell **B1**. The cell currently shows *Depart*. In the Clipboard group, click the **Cut** button. The contents of the cell are stored on the Clipboard, and a marquee appears around the cell border.
10. Click cell **E1**, and then click the **Paste** button. The contents are cut from cell B1 and moved to cell E1.
11. Click the column **D** heading to select the entire column. In the Clipboard group, click the **Cut** button. Select cell **B1**, and then click the **Paste** button. The entire column is moved and the AutoFit Column Width format still applies. The contents are moved to column B, and although all the cells are empty, column D still exists.
12. Select rows **4** and **5**. In the Cells group, click the **Insert** button arrow, and then click **Insert Sheet Rows**. Then select rows **9** and **10**. In the Clipboard group, click the **Cut** button. Click cell **A4**, and then click the **Paste** button.
13. Select rows **9** and **10**. In the Cells group, click the **Delete** button. The selected empty rows are deleted, and the content that was in row 11 is shifted up to row 9.
14. Save the changes, and leave the workbook open for the next Step-by-Step.

Using the AutoFill Feature to Copy Data

VOCABULARY
AutoFill

Filling data is another method for copying data in a worksheet. The ***AutoFill*** feature enables you to repeat the same data in a column or row. Using the AutoFill feature is faster than copying and pasting because filling requires only one step. However, the Fill command can only be used when the destination cells are adjacent to the original cell. You can use the mouse to automatically fill data up or down in the same column, or right or left in the same row.

Step-by-Step 18.10

1. If necessary, open the file **Vacations 6** from your solution files. Save the Vacations 6 workbook as **Vacations 7**, followed by your initials.
2. Click cell **D1**, type **Vacancy**, and press **Enter**.
3. Cell D2 is the active cell. Type **Yes**, and then press **Enter**.
4. Select the range **D2:D6**.
5. In the Editing group, shown in **Figure 18–17**, click the **Fill** button and then click **Down**. The content in cell D2 is copied and pasted into the cells in the D3:D6 range.

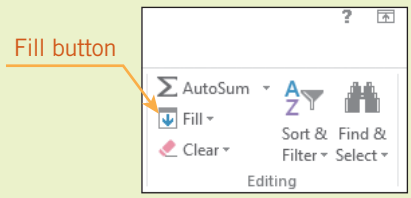
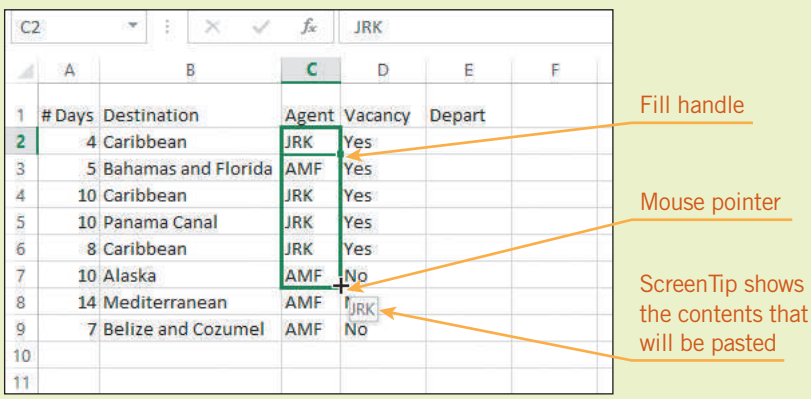


FIGURE 18–17
Editing group on the HOME tab

6. Click cell **D9**, type **No**, and then press **Enter**.
7. Select cells **D7:D9**. Click the **Fill** button, and then click **Up**. The text is copied from cell D9 and pasted into cells D8 and D7.
8. Click cell **C2**. Point to the *fill handle*, shown in **Figure 18–18**. When the pointer changes to a crosshair +, click and drag downward to select the range **C2:C7**. A ScreenTip shows the cell contents (JRK) that will be copied to the range of cells. Release the mouse button, and the contents of C2 are pasted, replacing the contents in cells C3 through C7.



	A	B	C	D	E	F
1	# Days	Destination	Agent	Vacancy	Depart	
2	4	Caribbean	JRK	Yes		
3	5	Bahamas and Florida	AMF	Yes		
4	10	Caribbean	JRK	Yes		
5	10	Panama Canal	JRK	Yes		
6	8	Caribbean	JRK	Yes		
7	10	Alaska	AMF	No		
8	14	Mediterranean	AMF	JRK		
9	7	Belize and Cozumel	AMF	No		
10						
11						

FIGURE 18–18
Filling down a range of cells

9. Deselect the cells. Save the changes, and leave the workbook open for the next Step-by-Step.

IC3
2-1.1.2
2-1.1.9
2-1.3.2
2-3.1.4

ABOVE AND BEYOND

To quickly fill to the cell on the right, click the destination cell and press Ctrl+R. The contents in the cell at the left are copied to the destination cell. To quickly fill down, click the destination cell and press Ctrl+D. The contents of the cell above are copied to the destination cell.

Using the AutoFill Feature to Fill in a Series

You can also use the AutoFill feature to automatically fill in a series of numbers and dates. To fill in a series, a pattern must be established in the initial selection of cells. Then when you drag the fill handle, the pattern is continued. When you drag the fill handle down or to the right, the series is continued in ascending order. However, when you drag the fill handle up or to the left, the series is continued in descending order.

Step-by-Step 18.11

IC3
2-1.1.9
2-1.3.1
2-1.3.2
2-3.1.4

1. If necessary, open the **Vacations 7** file from your solution files. Save the Vacations 7 workbook as **Vacations 8**, followed by your initials.
2. Click cell **E2**. Type **3/7**, and press **Enter**. The default setting automatically formats the numbers for the date to appear as *7-Mar*.
3. Type **3/14**, and press **Enter**.
4. You have now established a pattern (every 7 days) for the dates. Select the range **E2:E3**, and click and drag the **fill handle** downward to cell **E9**. When you release the mouse button, the dates for the next six weeks are entered into the cells.
5. With the range E2:E9 still selected, in the Editing group click the **Fill** button, and then click **Series**. The Series dialog box opens, as shown in **Figure 18–19**. The settings you see are the settings that you applied when you used the fill handle. When you want to modify the settings, you can click the Fill button and access this dialog box.

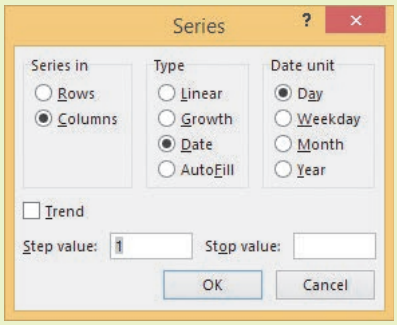
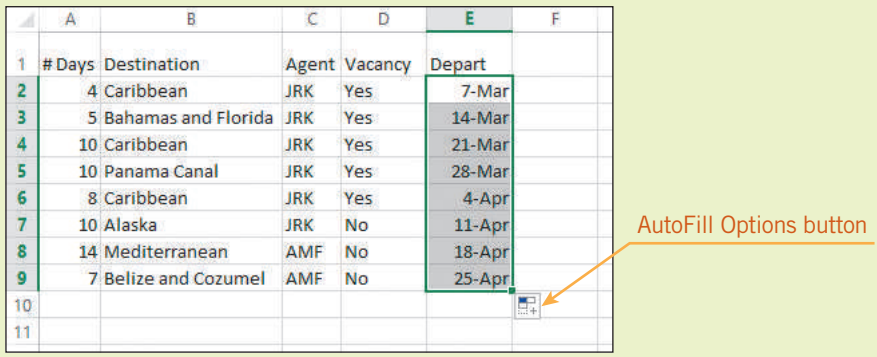


FIGURE 18–19
Series dialog box

6. Click **Cancel** to close the dialog box without making any changes.

7. Notice the Auto Fill Options button, shown in **Figure 18–20**, is displayed to the right of the fill handle in cell E8.



	A	B	C	D	E	F
1	# Days	Destination	Agent	Vacancy	Depart	
2	4	Caribbean	JRK	Yes	7-Mar	
3	5	Bahamas and Florida	JRK	Yes	14-Mar	
4	10	Caribbean	JRK	Yes	21-Mar	
5	10	Panama Canal	JRK	Yes	28-Mar	
6	8	Caribbean	JRK	Yes	4-Apr	
7	10	Alaska	JRK	No	11-Apr	
8	14	Mediterranean	AMF	No	18-Apr	
9	7	Belize and Cozumel	AMF	No	25-Apr	
10						
11						

FIGURE 18–20
After the range of cells is filled

8. With the range E2:E9 still selected, point to the *AutoFill Options* button. When the button expands to show a down arrow, click the **down arrow** to open the shortcut menu. The selected option, *Fill Series*, is the option you want. Click outside the shortcut menu to deselect the cells without making any changes.
9. Save the changes, and close the workbook.

TECHNOLOGY CAREERS

Computer Software Engineers

Computer software engineers evaluate situations, analyze needs, develop software to perform functions, and then verify and test the software to ensure that the requirements are met. They develop many types of software, including business applications, computer games, operating systems, and technical applications used in a variety of industries. They also solve technical problems as they arise. The tasks evolve quickly, so computer software engineers must continually strive to acquire new skills to keep up with changing technology. They must pay attention to detail and have strong problem-solving and analytical skills. Much of the work is part of a team effort, so computer software engineers must be able to communicate effectively with team members and other staff. Job prospects for computer software engineers are excellent. It is one of the fastest growing occupations.

SUMMARY

In this lesson, you learned:

- The Excel application window shows the Quick Access Toolbar, status bar, and other similar features used in other Microsoft Office applications.
- To navigate the workbook, you can use the mouse, keyboard shortcuts, touchscreen taps and gestures, and the scroll bars.
- You can choose from several options to view the worksheet, and you can change the zoom settings to specify the level of magnification.
- To enter data in a cell, the cell must be active. Depending on the width of the column, all the data may not be displayed, but the data is still contained in the cell.
- As you enter data, the AutoCorrect feature automatically corrects some of your keyboarding errors. If the data you are entering matches characters of existing entries in the column, the AutoComplete feature proposes the existing entry to save you time.
- When you insert or delete cells, rows, and columns, all existing data is shifted up, down, left, or right.
- To accommodate the data in a cell, you can widen the column and change the height of a row.
- To reorganize a worksheet, you can add and delete columns and rows; you can also delete, clear, copy and paste, or move the data.
- The Undo and Redo commands are available on the Quick Access Toolbar.
- The AutoFill feature enables you to quickly fill in a series of data.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The default setting aligns numbers at the left border of the cell.

T F 2. You can organize data in multiple worksheets and still save all the data in one workbook.

T F 3. When you insert or delete a row or a column in Excel, all existing data is shifted in some direction.

T F 4. To fill in a series, a pattern must be established in the initial selection of cells.

T F 5. To enter data in a cell, the cell must be active.

MULTIPLE CHOICE

Select the best response for the following statements.

1. The _____ is the column letter followed by the row number.
   A. cell name
   B. cell reference
   C. cell position
   D. cell label
2. The text or number in a cell is often referred to as a(n) _____.
   A. active cell
   B. range
   C. entry
   D. value
3. The _____ view displays the worksheet as it will appear when printed.
   A. Page Layout
   B. Print Layout
   C. Page Break Preview
   D. Page Preview

4. To move around in a worksheet, you can use the _____.
   A. mouse
   B. scroll bar
   C. keyboard
   D. all of the above
5. You can edit existing data _____.
   A. directly in the cell
   B. in the Formula Bar
   C. A or B
   D. none of the above

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. The _____ command automatically adjusts the column width to fit the cell with the most content.
2. A(n) _____ is the intersection of a single row and a single column.
3. _____ view is the default view in Excel.
4. The _____ feature is a quick and easy way to copy data to adjacent cells in a worksheet in a single step.
5. The worksheet is always stored in a(n) _____ that contains one or more worksheets.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. How do you know when a cell is selected?

2. What happens when you enter more characters than can fit in a cell?

3. Why are the AutoCorrect and AutoComplete features useful for entering data?

4. Describe how to adjust the column width using the mouse.

5. What happens when you paste new data into a cell that already contains data?

PROJECTS

PROJECT 18–1

2-1.3.1
2-1.3.2
2-3.1.4

1. Open the **Salaries.xlsx** file from the drive and folder where your Data Files folder is stored.
2. Start Word and create a new blank document. Save the document as **Salary Values**, followed by your initials.
3. Navigate the worksheet to answer the following questions. Create a list in the Word document, and enter your answers.
   a. What is the value in cell N53?
   b. What is the value in cell K49?
   c. What is the value in cell S70?
   d. What is the cell reference for the last cell with a value in column J?
   e. What is the cell reference for the last cell with a value in row 73?
   f. In the range N50:P53, how many of the cells contain values?
4. Save the changes to the Word document Salary Values, and then close the document and exit Word.
5. Close the workbook without saving any changes.

PROJECT 18–2

2-1.3.1
2-1.3.3
2-3.1.1
2-3.1.2
2-3.1.4

1. Create a new blank workbook in Excel, and save it as **Rescued Dogs**, followed by your initials.
2. Beginning in cell A1, enter the following data in the cells. Use the AutoComplete feature to save time entering some of the repetitive data.

female	**adult**	**Chocolate Labrador Retriever**
male	**young**	**Boxer**
male	**baby**	**Chihuahua**
female	**baby**	**Saint Bernard**
male	**young**	**Dachshund**
male	**young**	**Yellow Labrador Retriever**
female	**adult**	**Border Collie**
male	**adult**	**German Shepherd**
male	**young**	**Yellow Labrador Retriever**
male	**young**	**Siberian Husky**

3. Insert a new column to the left of the current column A, and add the names below.

Bella
Sebastian
Shaggy
Maggy
Buddy
Chesterfield
Bailey
Rocky
Charlie
Max

4. Use the AutoFit feature to adjust all the column widths.
5. Add three new rows at the top of the worksheet.
6. In cell A1, type **Rescued Dogs**.
7. In the third row, enter the following column headings:

Name **Gender** **Age** **Breed**

8. In cell C8, change *young* to **adult**. In cell A1, change *Rescued Dogs* to **Dogs for Adoption**.
9. Delete row 6.
10. Save the changes, and close the workbook.

PROJECT 18–3

2-1.3.1
2-1.3.2
2-3.1.1
2-3.1.2
2-3.1.4

1. Open the **Purchase Orders** file from the drive and folder where your Data Files folder is stored. Save the Purchase Orders workbook as **Revised Purchase Orders**, followed by your initials.
2. Use the AutoFill feature to complete the series of shoe sizes. Fill the series in the range A6:A18 (sizes 7 through 13).
3. Edit each of the headings in row 1 so the first letter is capitalized. For example, change *court* to **Court**.
4. Use the AutoFit feature to adjust all the column widths.
5. Complete the form by adding the following quantities for the shoe sizes:

Court:	**1 size 9**
Cross-training:	**1 size 6 and 1 size 8.5**
Soccer:	**3 size 10.5**
Basketball:	**4 size 10**
Running:	**1 size 9.5 and 2 size 12**
Walking:	**2 size 9**

6. Insert a new column before the *Court* column, and then move the column of data for Basketball to the new column B.
7. Delete the empty column G and also column E.
8. Save the changes, and close the workbook.

PROJECT 18–4

2-1.3.1
2-1.3.3
2-3.1.2
2-3.1.4

1. Create a new blank workbook, and save it as **Class Schedule**, followed by your initials.
2. In cell B1, type **Monday**. In cell C1, type **Tuesday**. Use the AutoFill feature to copy the series of week-days to the range D1:F1 (Monday through Friday).
3. In cell A2, type **8:30 am**, and press **Enter**. The default setting will change the number format to 8:30 AM. In cell A3, type **9:00 am**, and press **Enter**. Use the AutoFill feature to copy the series of times to the range A4:A18 (8:30 AM–4:30 PM).
4. In cell B2, type **TECH 211**, and press **Enter**. Copy and paste the contents in cell D2.
5. In cell C5, type **TECH 110**. Copy and paste the contents in cell E5.
6. In cell B7, type **ACCT 202**. Copy and paste the contents in cells D7 and F7.
7. In cell B11, type **ITNLBUS 231**. Copy and paste the contents in cells D11 and F11.
8. In cell F14, type **TECH LAB 211**. Fill the cell contents to the cells to the left so that the class title appears *Tuesday through Friday*.
9. Change all the column widths to 15.
10. Save the changes, and close the workbook.

TEAMWORK PROJECT

With a partner, explore voting statistics for your state in U.S. presidential elections from 1980 through the most recent presidential election. Follow these steps:

1. Using an almanac or Web research tools, find information on the popular vote for Republican, Democrat, and independent candidates for your state in each election. If there is more than one independent candidate, add together all the votes for all independent candidates. Collect data from 1980 through the most current presidential election. Divide the research assignment evenly so both you and your partner gather the data. For example, you research the election results from 1980 to 1992, and your partner researches the results from 1996 to present.
2. Create a worksheet to compile your data. Save the document as **TP 18–1**, followed by your initials.
3. In column A, type **1980** in one cell, and then type **1984** in the cell below it. Use the AutoFill feature to add the remaining presidential election years up to and including the most recent presidential election.
4. Create columns for *Republican*, *Democrat*, and *Independent* candidates. Enter the data you have gathered and adjust the column widths as needed.

2-1.1.2
2-1.1.9
2-1.3.1
2-1.3.3
2-3.1.1
2-3.1.2
2-3.1.4

5. Add a column to your worksheet, and title it **Winning Party**. Insert the political party of the candidate who won each election nationally. Use the AutoComplete feature or the AutoFill feature to insert parties if the same party won two or more consecutive presidential elections.
6. Save the changes to the document.
7. Review the data in your completed worksheet, and determine which party won most often in the years you tracked. Close the document.

CRITICAL THINKING

CRITICAL THINKING 18–1

In this lesson you used several keyboard shortcuts to navigate a worksheet.

2-3.1.1
2-3.1.2

1. Create a new Word document, and save the document as **CT 18–1**, followed by your initials.
2. Describe the advantages to using keyboard shortcuts to navigate a worksheet.
3. Save the changes to the document, and then close the document.

CRITICAL THINKING 18–2

In this lesson you learned to use Excel features to organize data.

2-3.1.2

1. Create a new Word document, and save the document as **CT 18–2**, followed by your initials.
2. Write a brief paragraph describing how you can use an Excel workbook to help you organize and maintain some personal data.
3. Save the changes to the document, and then close the document.

ONLINE DISCOVERY

You saved your Excel file to the cloud, but the computer you are now using does not have Excel installed. Explore Microsoft.com to learn how you can access your file.

1. Create a new blank workbook. Save the workbook as **OD 18–1**, followed by your initials.
2. Explain how you can access an Excel 2013 file if the application software is not installed on your computer.
3. Save the changes, and close the document.

2-3.1.2

JOB SKILLS

1. Your supervisor at work has asked you to submit a list of dates you are available to work next month, and you realize that you can use Excel to quickly prepare the information.
2. Create a new blank workbook. Save the workbook as **JS 18–1**, followed by your initials.
3. In the worksheet, enter some sample data to indicate dates you are available to work. Be sure to organize the data logically and label the data effectively.
4. Save the changes, and close the workbook.

2-3.1.4

EXPLORE AND SOLVE

In this lesson you learned to use the AutoFill feature to copy and repeat data in worksheet cells. Excel also has another fill feature called Flash Fill. As you enter data in a spreadsheet, Excel can recognize a pattern and detect how you want to enter the data. You can use the Flash Fill feature to remove or add data, add formatting, convert data, and correct inconsistencies.

1. Explore how to use the Flash Fill feature.
2. Open the **Salaries.xlsx** file from the drive and folder where your Data Files folder is stored. Save the document as **ES 18–1**, followed by your initials.
3. Insert a new column to the left of column B. Add the column heading **Emp. #**.
4. In the new column B, use the Flash Fill feature to enter the employee numbers that appear in column A. However, in the new column B, the employee numbers should all show a hyphen after the first number 1.
5. Delete column A.
6. Save the changes to the document, and then close the document.

2-3.1.1



Estimated Time:
1.5 hours

LESSON 19

Organizing and Enhancing Worksheets

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Hide, show, and freeze columns and rows.
- Create, rename, and delete worksheets.
- Change the page setup of a worksheet and add headers and footers.
- Customize the print options.
- Apply fonts, alignments, number formats, and conditional formatting to worksheet cells.
- Apply borders, fill colors, and styles to worksheet cells.
- Sort and filter data in a worksheet.
- Save a workbook in PDF and XPS formats.

WORDS TO KNOW

cell style
collated
conditional formatting
filter
footer
freeze
header
header row
split
table style
worksheet tab

DATA FILES

To complete this lesson, you will need these data files:

Courses.xlsx
Employees.xlsx
Expense Report.xlsx
Salaries.xlsx
Support.xlsx
Tall Structures.xlsx
Utilities.xlsx

Microsoft product screenshots used with permission from Microsoft Corporation.

Common uses of spreadsheets include reporting finances, managing expenses and budgets, and tracking student grades. A key feature of Microsoft Excel is how easy it is to organize the data in a worksheet. You can change the appearance of the spreadsheet to emphasize specific data, and you can sort the information to highlight significant data. You will also find it useful to print completed worksheets, and there are many options you can use to make your printed spreadsheets clear, informative, and professional looking.

Managing Worksheets

One of the advantages of working with electronic spreadsheets is that you can keep expanding the rows and columns, and then you can continue to add data. Eventually, though, as the spreadsheet grows in size, locating the data becomes more tedious. In this lesson you will learn how to manage worksheets so you can access data more efficiently.

Hiding and Showing Worksheet Data

VOCABULARY
header row

A ***header row*** contains column headings or field names in a data source, such as a table or spreadsheet. In Excel, the header row provides labels that identify the content in the worksheet columns. Effective column headings make it easy to identify information in a worksheet. When navigating through a large worksheet, though, the header row sometimes scrolls out of view, which makes it difficult to continue to identify the data in the cells or locate the correct cell so you can input data accurately. One option to overcome this problem is to change the zoom setting. However, if you need to reduce the magnification significantly, you will not be able to read the data. Another option is to hide some of the rows and columns so you can focus on a particular range of data. When you hide rows and columns, the data remains intact; it is just not visible on the screen.

Step-by-Step 19.1

IC3
2-1.1.3
2-1.3.6

1. Start Excel and open the file **Salaries** from the drive and folder where your Data Files folder is stored. Save the Salaries workbook as **Revised Salaries 1**, followed by your initials.
2. Note that the headings in the header row identify the years from 1998 to 2016. The labels in the first column provide employee numbers.
3. Press **F5** to open the Go To dialog box. Type **k44** and click **OK** to move to that cell. Note that you can no longer see the column headings at the top of the screen, so you cannot identify what year the money was earned.
4. Select the cell range **K44:N47**. Click the **VIEW** tab, and then in the Zoom group shown in **Figure 19–1**, click the **Zoom** button.

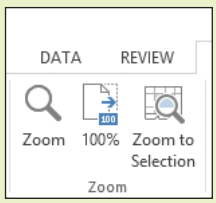


FIGURE 19–1
Zoom group on the VIEW tab

5. Note that the default Zoom setting is 100%. Click **50%** to change the magnification setting, and then click **OK**. If necessary, scroll up to show the top row in the spreadsheet. The content in the cells is much smaller now, but you can see the labels for columns K, L, M, and N, as well as the employee numbers in column A. The row numbers and column letters are highlighted, which makes it easier to identify the employee numbers and years.
6. With the cell range selected, click the **Zoom to Selection** button. The selected cells are magnified and fill the entire worksheet window. Click the **100%** button to reduce the magnification and return to the default settings.
7. Depending on the size of your screen, you may not see the first column that shows the employee numbers, in which case you cannot identify the employee. If necessary, drag the horizontal scroll bar to the left to view the data in column A.
8. You want to see the earnings for the years 2011 through 2016, so you can hide the columns for 1998–2010. Press and hold **Ctrl**, and then press **Home** to move back to cell A1. Select columns **B** through **N**.
9. Click the **HOME** tab, and then in the Cells group, click the **Format** button. Under *Visibility*, point to *Hide & Unhide*, and then in the submenu click **Hide Columns** as shown in **Figure 19–2**. Column O with the *2011* heading is now the second column on the screen, but when you scroll down, you see that no cell contents appear in that column until row 49.

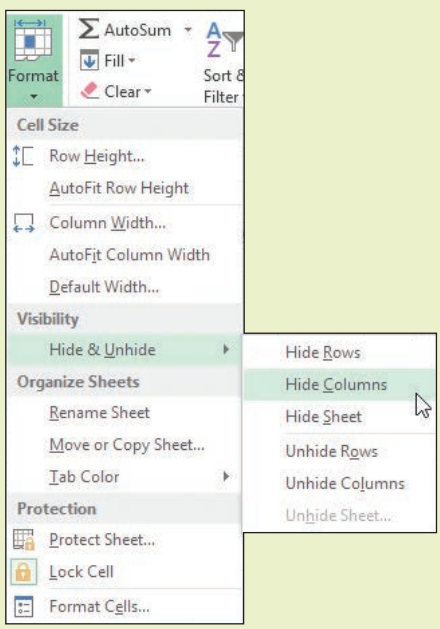


FIGURE 19–2
Format menu and submenu

10. You can also hide the rows above row 49. Select rows **2** through **48**. Click the **Format** button, point to *Hide & Unhide*, and then click **Hide Rows**. Now you can quickly access the data for the years 2011 through 2016.
11. Save the changes to the workbook. Then, save the workbook as **Revised Salaries 2**, followed by your initials.
12. Select columns **A** and **O**. Click the **Format** button, point to *Hide & Unhide*, and then click **Unhide Columns**. All the columns in the worksheet are now visible again.
13. Select rows **1** and **49**. Click the **Format** button, point to *Hide & Unhide*, and then click **Unhide Rows**. Deselect the rows. All the cells in the worksheet are now visible.
14. Save the changes, and leave the workbook open for the next Step-by-Step.

Freezing Rows and Columns

VOCABULARY
freeze

Another way to keep rows and columns visible as you navigate through a worksheet is to freeze them. When you ***freeze*** columns and/or rows, you lock them so you can keep an area visible as you scroll through the worksheet. By freezing rows and columns, you do not have to hide any data.

Step-by-Step 19.2

IC3 2-1.1.3

1. If necessary, open the file **Revised Salaries 2** from your solution files.
2. Click the **VIEW** tab, and then in the Window group shown in **Figure 19–3**, click the **Freeze Panes** button. Click **Freeze Top Row**. The top row is now locked, and a thin gray border is displayed at the bottom of the row. Scroll down to row 76. Notice as you scroll down through the rows in the worksheet the column headings in the header row do not disappear.

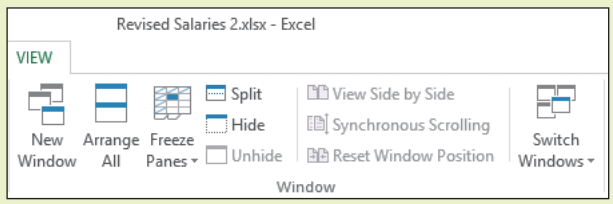


FIGURE 19–3
Window group on the VIEW tab

3. Click anywhere in column **B**. Click the **Freeze Panes** button, and then click **Freeze First Column**. The first column is now locked, and a thin gray border is displayed on the left side of the column. Also notice that the border line is no longer displayed below the header row. The first row in the worksheet is unlocked because the command was to lock only the first column.

4. Scroll across the screen to view the last column. Notice as you scroll across the columns in the worksheet that the first column with the employee numbers does not disappear.
5. Click the **Freeze Panes** button, and then click **Unfreeze Panes**. The column is unlocked.
6. Click cell **B14**. To lock both rows and columns, click the **Freeze Panes** button, and then click **Freeze Panes**. A thin gray border is displayed at the bottom of the row above the active cell and on the right side of the column to the left of the active cell. Scroll down and across the worksheet. Column A and rows 1 through 13 are locked.
7. Save the changes to the workbook, and then save the Revised Salaries 2 workbook as **Revised Salaries 3**, followed by your initials.
8. Click the **Freeze Panes** button, and then click **Unfreeze Panes**.
9. Save the changes and leave the workbook open for the next Step-by-Step.

Splitting Rows and Columns

VOCABULARY
split

An alternative way to display data is to ***split*** a worksheet, which divides the worksheet into either two or four panes. Splitting the worksheet enables you to show different data in each pane. To split the window into two horizontal panes (one above the other), you must first select a cell anywhere within Column A. To split the window into two vertical panes (side by side), you must first select a cell anywhere within row 1. To split the window into four panes, you must first select a cell outside of column A and row 1. After splitting the worksheet into panes, you can increase or decrease the size of the panes by dragging the split bar.

Step-by-Step 19.3

IC3
2-1.1.3
2-1.1.4
2-1.3.6

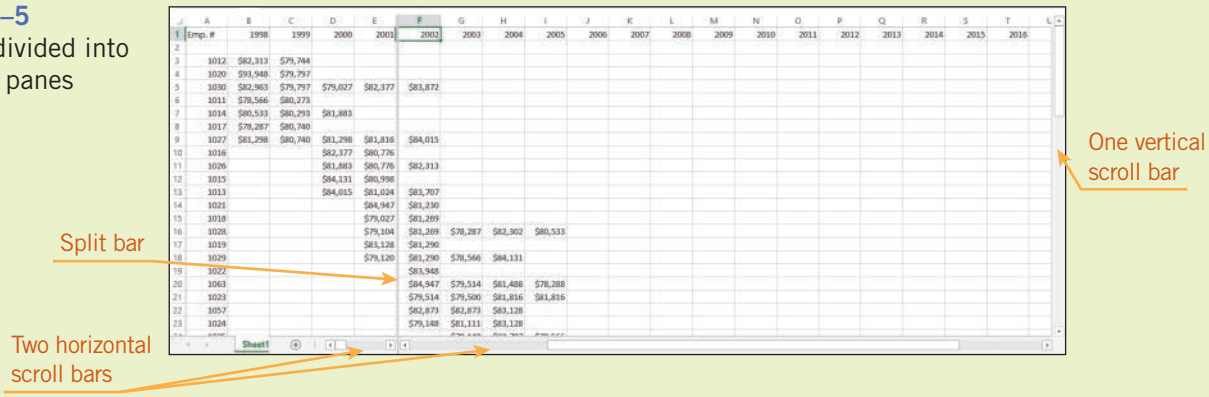
1. If necessary, open the **Revised Salaries 3** workbook from your solution files. If necessary, show the **VIEW** tab.
2. To split the window into two horizontal panes, select cell **A15**. In the Window group, click the **Split** button. The worksheet is divided into two panes, and the split bar is positioned between rows 14 and 15, as shown in **Figure 19–4**.



FIGURE 19–4
Worksheet divided into two horizontal panes

3. Note that there are two vertical scroll bars and one horizontal scroll bar. Drag the vertical scroll bar for each pane to see how each pane scrolls separately. Then drag the horizontal scroll bar. The columns in both panes are synchronized and move together. Drag both vertical scroll boxes to the top of the scroll bars, and then drag the horizontal scroll box to the left edge of the horizontal scroll bar.
4. Position the mouse pointer over the *split bar*. When the pointer changes to a double-headed arrow ⇳, click and drag the **split bar** down to the bottom of row **20**. The top pane now displays more rows of data. Click anywhere in the bottom pane, and then scroll down to show row 30 at the top of the bottom pane. You can now compare the data in row 20 with the data in row 30.
5. Click the **Split** button to remove the split and restore the worksheet view to one pane.
6. To split the window into two vertical panes, select cell **F1** and then click the **Split** button. The worksheet is divided into two panes, as shown in **Figure 19–5**. Note that there is one vertical scroll bar and two horizontal scroll bars. When you move the horizontal scroll bar, the panes scroll separately. When you move the vertical scroll bar, the rows in both panes are synchronized and move together.

FIGURE 19–5
Worksheet divided into two vertical panes



7. Click and drag the **split bar** to the left to show only columns A and B in the left pane. In the right pane, scroll all the way to the left. Note that all the columns appear in the right pane. Then, in the right pane, scroll to the right to display column F at the left side of the pane. You can now easily compare the data in column B with the data in column F.
8. Point to the *split bar*. When the pointer changes to a double-headed arrow, double-click the **split bar** to remove the split and restore the workbook to one pane.

9. To split the window into four panes, select cell **G15**. Click the **Split** button. The worksheet is divided into four panes, as shown in **Figure 19–6**. Note that there are two vertical scroll bars and two horizontal scroll bars.

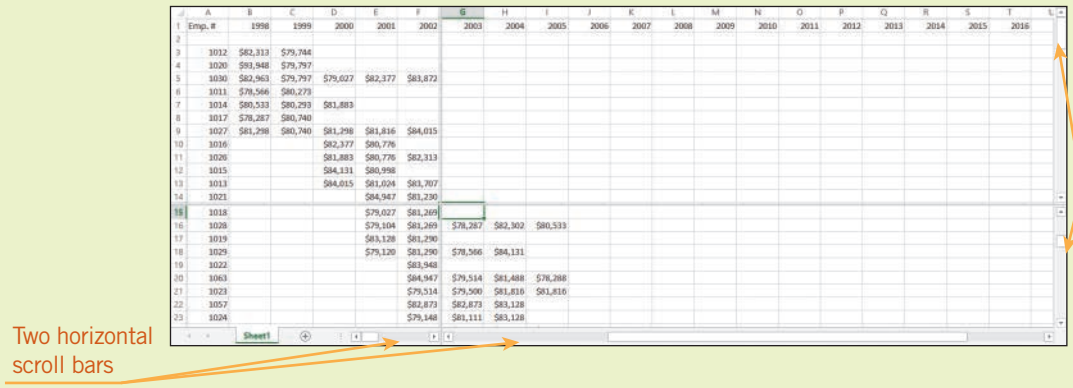


FIGURE 19–6
Worksheet divided into four panes

10. Click anywhere in the upper-right pane. Using the vertical scroll bar for the upper-right pane, scroll down to row 20. As you scroll through the upper-right pane, the scroll is synchronized in the upper-left pane.
11. Click anywhere in the lower-left pane. Using the horizontal bar below the lower-left pane, scroll to the right. As you scroll through the lower pane on the left, the scroll is synchronized in the lower-right pane.
12. Save the changes to the workbook. Close the workbook and then reopen it. Note that the worksheet is still split into four panes.
13. Click the **Split** button to remove the split and restore the worksheet view to one pane.
14. Leave the workbook open for the next Step-by-Step. If you take a break before Step-by-Step 19.4 and close the worksheet, do not save the changes.

ABOVE AND BEYOND

By default, new blank workbooks include only one worksheet. The maximum number of worksheets per workbook is limited by the available memory.

Working with Multiple Worksheets

Excel is useful for organizing data into categories, such as time frames, sales regions, or account names. A workbook can be three dimensional because you have the length, width, and depth. When a single worksheet grows to a large size in length or width, you can organize related information in multiple worksheets, which adds depth.

Compare the workbook to a three-ring binder with tabs. When you need to add a new topic to the binder, you add a new tab to the binder. When you need to add a new category to an Excel workbook, you add a new worksheet to the workbook. At the bottom of the workbook window, a ***worksheet tab*** is displayed for quick and easy access to the worksheet. At any time, you can rename the tabs in the binder, and at any time you can rename the worksheet tabs in the workbook. A well-organized workbook presents the data logically, and the rows, columns, and worksheets are labeled effectively.

VOCABULARY
worksheet tab

When you no longer need a category, you can remove the information and the tab from a binder. Likewise, when you no longer need the data in a worksheet, you can delete the data and the worksheet from the workbook.

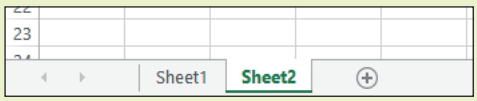
You can copy and paste data from one worksheet to another. When you paste content, you can preview the results and choose from several pasting options, which change based on the destination and on the content you are pasting.

Step-by-Step 19.4

IC3 2-1.1.2 2-3.1.4

1. If necessary, open the file **Revised Salaries 3** from your solution files. Save the Revised Salaries 3 workbook as **Revised Salaries 4**, followed by your initials. If necessary, remove the split so that the worksheet view is one pane.
2. At the bottom of the workbook window, click the **New sheet** button ⊕. A blank worksheet opens. As shown in **Figure 19–7**, at the bottom of the window, a worksheet tab for the new worksheet appears to the right of the last active worksheet tab, *Sheet1*. Excel automatically assigns the name *Sheet* and a sequential number (in this case *2*) to each new worksheet.

FIGURE 19–7
New worksheet tab *Sheet2*

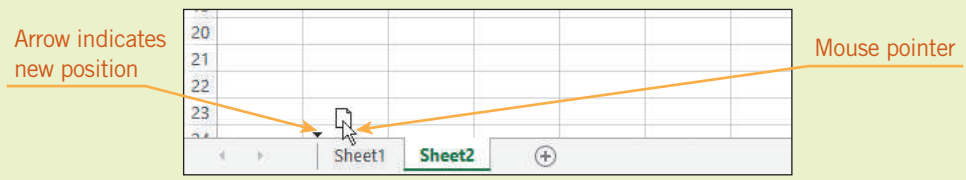


3. Sheet2 is now the active worksheet. The tab is white with a green underline. Click the **Sheet1** worksheet tab. Then click the **New sheet** button. A new Sheet3 worksheet tab appears between the Sheet1 and Sheet2 worksheet tabs.
4. Click the **HOME** tab. In the Cells group, click the **Insert** button arrow and then click **Insert Sheet**. A new worksheet tab *Sheet4* appears between *Sheet1* and *Sheet3*.
5. *Sheet4* is now the active worksheet. In the Cells group on the HOME tab, click the **Delete** button arrow, and then click **Delete Sheet**. The *Sheet4* worksheet tab disappears, and the worksheet is removed from the workbook. Right-click the **Sheet3** worksheet tab, and in the shortcut menu click **Delete**. The *Sheet3* worksheet tab disappears, and the worksheet is removed from the workbook.
6. Click the **Sheet2** worksheet tab and hold the mouse button. The pointer changes to a sheet, and a down-pointing arrow appears at the upper-left corner of the worksheet tab. Drag the **worksheet** tab to the upper-left corner of the *Sheet1* tab as shown in **Figure 19–8**, and then release. The order of the worksheet tabs is rearranged.

QUICK TIP

When you delete a tab for a worksheet that contains data, a prompt will appear indicating the worksheet may contain data and asking if you want to permanently delete the data.

FIGURE 19–8
Changing the order of the worksheet tabs



7. Double-click the **Sheet2** worksheet tab. The worksheet name is selected. Type **Current Employees** and press **Enter**. The worksheet tab name is replaced with the new worksheet name.
8. Right-click the **Sheet1** worksheet tab, and in the shortcut menu click **Rename**. The worksheet name is selected. Type **Salaries** and press **Enter**.
9. Open the file **Employees** from the drive and folder where your Data Files folder is stored. Select the range **A1:D27**. In the Clipboard group, click the **Copy** button. A marquee surrounds the copied cells.
10. Point to the *Microsoft Excel* button in the taskbar, and switch to the **Revised Salaries 4** workbook. Click the **Current Employees** worksheet tab. Cell A1 is already the active cell. In the Clipboard group, click the **Paste** button. The copied data from Sheet1 in the Employees workbook is pasted into the Current Employees worksheet.
11. Switch to the **Employees** workbook. Press **Esc** to remove the marquee from the selected cells. Close the workbook without saving any changes.
12. In the **Revised Salaries 4** workbook, deselect the cells, and save the changes to the workbook. Leave the workbook open for the next Step-by-Step.

Formatting the Page Layout

A well-organized worksheet must also have an effective page layout. When a worksheet contains a large amount of data, you can make some adjustments to the page layout so the data is easy to read and access.

Changing the Page Setup

Page Break Preview shows you exactly how the worksheet will be printed. When the worksheet is more than one page in length, Excel determines where to break the page and begin a new one. If you do not like where Excel has split the data between pages, you can create your own page break by dragging the page break to a new location or by selecting a row or cell and inserting a manual page break.

Portrait orientation, the default setting in Excel, formats the content of the worksheet with the short edge of the page at the top. You can change to landscape orientation, which formats the worksheet with the long edge of the page at the top. Another option for page layout is to use the Fit to command to fit the worksheet to a number of pages you designate. The default setting is 100%, and the Fit to command scales the worksheet up or down as necessary.

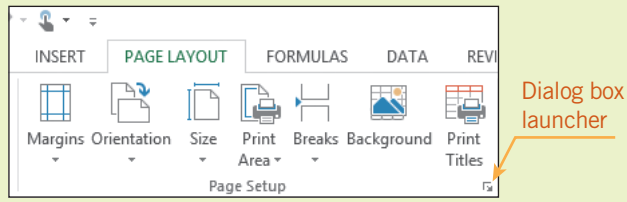
When you change the page setup settings, the new settings apply only to the current worksheet; they do not apply to all the worksheets in the workbook.

Step-by-Step 19.5

IC3
2-1.1.4
2-1.3.6
2-3.1.4

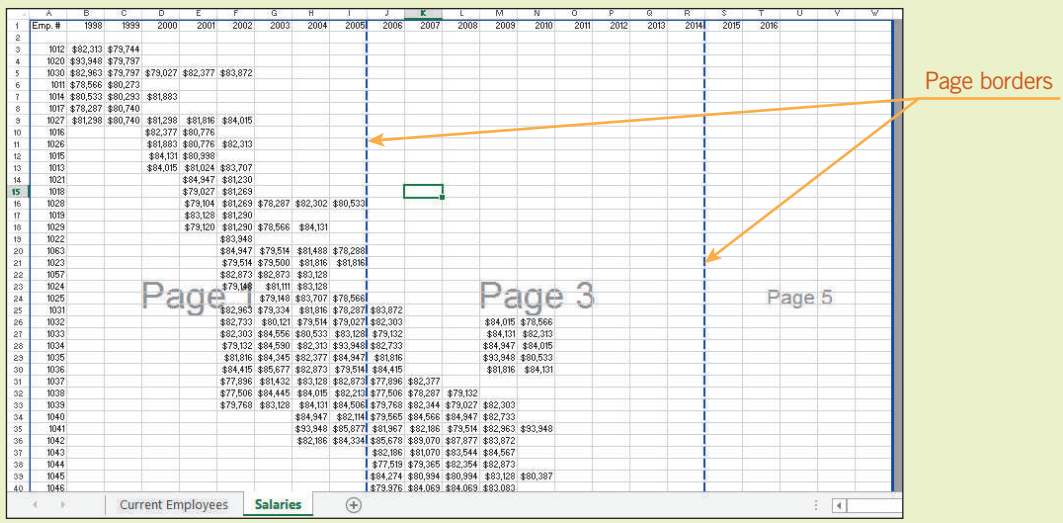
1. If necessary, open the file **Revised Salaries 4** from your solution files. Save the Revised Salaries 4 workbook as **Revised Salaries 5**, followed by your initials. Click the **Salaries** worksheet tab to make it the active worksheet.
2. Click the **PAGE LAYOUT** tab, and then, in the Page Setup group shown in **Figure 19–9**, click the **dialog box launcher** to open the Page Setup dialog box, which provides options similar to those in Word. Under *Scaling*, make sure the **Adjust to** option is enabled and set to **100%**. Click **OK** to accept the settings.

FIGURE 19–9
Page Setup group on the PAGE LAYOUT tab



3. Click the **VIEW** tab. If necessary, in the Workbook Views group click the **Normal** button. Scroll down through the worksheet data and you will see broken gray border lines below rows 47 and 94. You will also see border lines indicating page breaks to the left of column J and to the left of column S.
4. In the Workbook Views group, click the **Page Break Preview** button. Broken blue lines, as shown in **Figure 19–10**, indicate borders for the six pages, and the page borders are the same as those that were displayed in Normal view.

FIGURE 19–10
Page borders in Page Break Preview



5. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **Orientation** button, and then click **Landscape**. Scroll down through the worksheet data. Six pages are still displayed on the screen, but the border lines shift for the new page layout.
6. Scroll back to the top of the worksheet. Point to the *vertical border* between Page 1 and Page 4. When the pointer changes to a double-headed arrow ↔, click and drag the border to the right to include columns N, O, and P on page 1. The adjusted vertical border is now displayed as a solid line because you manually created the page break.
7. Select row **35**. In the Page Setup group, click the **Breaks** button, and then click **Insert Page Break**. Deselect the row. A solid line indicates a manual page break between rows 34 and 35. On the Quick Access Toolbar, click the **Undo** button.
8. Click cell **J39**. Click the **Breaks** button, and then click **Insert Page Break**. Manual breaks are inserted both above and to the left of the active cell.
9. Click the **Breaks** button, and then click **Reset All Page Breaks** to restore the default page break layout.
10. In the Page Setup group on the PAGE LAYOUT tab, click the **dialog box launcher** to open the Page Setup dialog box. Under *Scaling*, click to enable the **Fit to** option. Keep the default setting of *1 page(s) wide by*, and change the *tall* setting to **2**. Click **OK**. Now only one page break is displayed, and the worksheet data fits on two pages.
11. Click the **VIEW** tab. In the Workbook Views group, click the **Page Layout** button. In the Zoom group, click the **Zoom** button, click the **50%** option, and then click **OK**. Scroll down to view the worksheet data on two pages.
12. In the Zoom group, click the **100%** button.
13. Save the changes, and leave the workbook open for the next Step-by-Step.

Creating a Header and a Footer

VOCABULARY
header
footer

Headers and footers are a means of providing useful information on a printed worksheet. A ***header*** is information and/or graphics that are printed in the top margin of a worksheet, and a ***footer*** is information and/or graphics that are printed in the bottom margin of the worksheet.

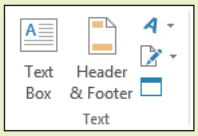
You can manually create a header or footer by entering information in the header or footer pane. Fields can be used to automatically insert dates, times, filenames, the file path, the worksheet name, and page numbers. By using fields instead of manually entering the information, the information is always updated automatically. For example, if you use the date field in the footer, whenever you print the worksheet, the footer will include the current date. You can choose from several built-in headers or footers that are constructed using fields, or you can create your own customized headers and footers by inserting the fields yourself.

Step-by-Step 19.6

2-1.1.4
2-1.3.6

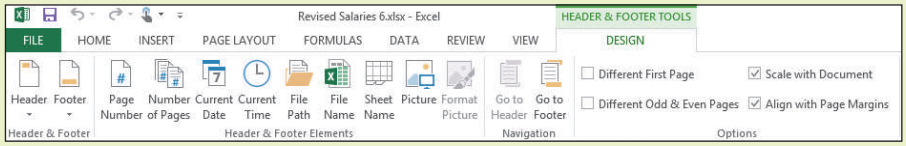
1. If necessary, open the file **Revised Salaries 5** from your solution files. Save the Revised Salaries 5 workbook as **Revised Salaries 6**, followed by your initials. If necessary, click the **Salaries** worksheet tab. The worksheet should already be displayed in Page Layout view.
2. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **dialog box launcher**. Under *Scaling*, click to enable the **Adjust to** option, and change the setting to **100%** normal size. Click **OK**.
3. Click the **INSERT** tab. In the Text group shown in **Figure 19–11**, click the **Header & Footer** button.

FIGURE 19–11
Text group on the INSERT tab



4. The Ribbon changes to show the HEADER & FOOTER TOOLS DESIGN tab shown in **Figure 19–12**. The header pane with three cells (left, middle, right) is displayed at the top of the worksheet. The middle cell of the header pane is already selected.

FIGURE 19–12
HEADER & FOOTER TOOLS DESIGN tab



5. In the Header & Footer group, click the **Footer** button, and then click **Page 1 of ?**. The worksheet view changes to show the bottom of the first worksheet page.
6. At the bottom of the first worksheet, *Page 1 of 6* is displayed in the middle cell of the footer pane. Press the **Page Down** key. The footer for the second page shows *Page 2 of 6*.
7. Scroll to the top of the worksheet, and click in the **header pane** where it says *Click to add header*.
8. If necessary, click the **HEADER & FOOTER TOOLS DESIGN** tab. In the Header & Footer Elements group, click the **Sheet Name** button. The *&[Tab]* field, which is a code that inserts the worksheet name, is displayed in the cell.

9. Click the **cell** on the right side of the header pane. The worksheet name *Salaries* is displayed in the middle cell. In the Header & Footer Elements group, click the **Current Date** button. The *&[Date]* field is displayed in the cell.
10. Click anywhere in the worksheet. Scroll through at least the first two pages to view the header and the footer.
11. Save the changes, and leave the workbook open for the next Step-by-Step.

Customizing Print Options

Before you send a worksheet to the printer, take the time to see what the printed copy will look like. This gives you one more opportunity to review the page setup and confirm that the information you want to print will be included in the printed copy. For example, you might expect the printed worksheet to look like what you see on the screen. You are accustomed to seeing the worksheet gridlines, row numbers, and column letters. However, when using the default print settings, these elements are not printed.

By default, Excel prints the entire worksheet. If you do not want to print all the worksheet data, you can identify the range you want to print before you choose the Print command. When you create a print area, the print setting is saved with the worksheet.

If the worksheet will be printed on multiple pages, you may want to print the row and/or column headings on every page so the user does not need to keep referring back to the first page of the worksheet to identify the cell contents. Also, when printing multiple copies, you can use the collated setting. When printed pages are ***collated***, the printed pages are organized in the proper sequence. For example, if you are printing three copies of a worksheet with six pages, the first set of pages 1 through 6 comes out in the tray, then the second set of six pages is printed, and then the third set of six pages is printed.

VOCABULARY
collated

Before printing a worksheet, you can change the settings for worksheet orientation, page size, the margins, and scaling. You can easily change these settings using commands on the PAGE LAYOUT tab, in the Page Setup dialog box, or in Backstage view.

Step-by-Step 19.7

1. If necessary, open the file **Revised Salaries 6** from your solution files. Save the Revised Salaries 6 workbook as **Revised Salaries 7**, followed by your initials. If necessary, click the **Salaries** worksheet tab to make it the active worksheet.
2. Click the **VIEW** tab, and in the Workbook Views group, click the **Normal** button. Select the range **A1:F15**. Click the **PAGE LAYOUT** tab. In the Page Setup group, click the **Print Area** button, and then click **Set Print Area**.

IC3 2-1.1.4

3. Deselect the cells. The print area is identified with a thin gray line border around the selected range of cells. Select the range **A17:I25**. Click the **Print Area** button, and then click **Add to Print Area**. Additional data is identified for printing, but the data in row 16 (Employee #1028) will not be printed.
4. Select the range **A28:K31**. Click the **Print Area** button, and then click **Add to Print Area**.
5. Click the **FILE** tab, and then click **Print**. Only the content in the first print area is displayed on the first page in the Print Preview pane.
6. At the bottom of the Preview pane, click the **Next Page** arrow to preview the second page. The second print area is displayed on the second page. Click the **Next Page** arrow to preview the third print area on page 3.
7. Note that the gridlines, row numbers, and column letters do not appear in the Print Preview pane. Press **Esc** to close Backstage view. In the Sheet Options group on the PAGE LAYOUT tab, shown in **Figure 19–13**, the check marks indicate that the settings to view the gridlines and headings are enabled. Click to enable the **Print** check boxes under *Gridlines* and also under *Headings* so the gridlines and headings will also appear when the worksheet is printed.

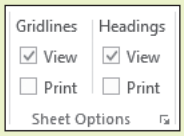


FIGURE 19–13
Sheet Options group on the PAGE LAYOUT tab

8. Click the **FILE** tab, and then click **Print**. Now the gridlines and the row and column headings also appear in the Print Preview pane. Press **Esc** to exit Backstage view.
9. In the Page Setup group, click the **Print Area** button, and then click **Clear Print Area**. The print area borders are removed from the cells, and the default page break borders are displayed.

10. Because all the pages in the worksheet will be printed, you want the column titles to be printed on each page. In the Page Setup group, click the **Print Titles** button . The Page Setup dialog box shown in **Figure 19–14** opens.

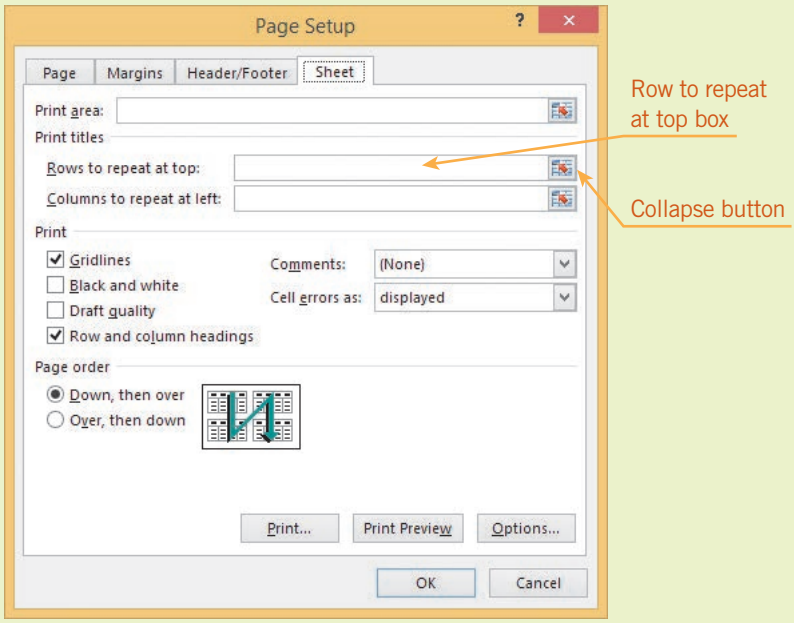


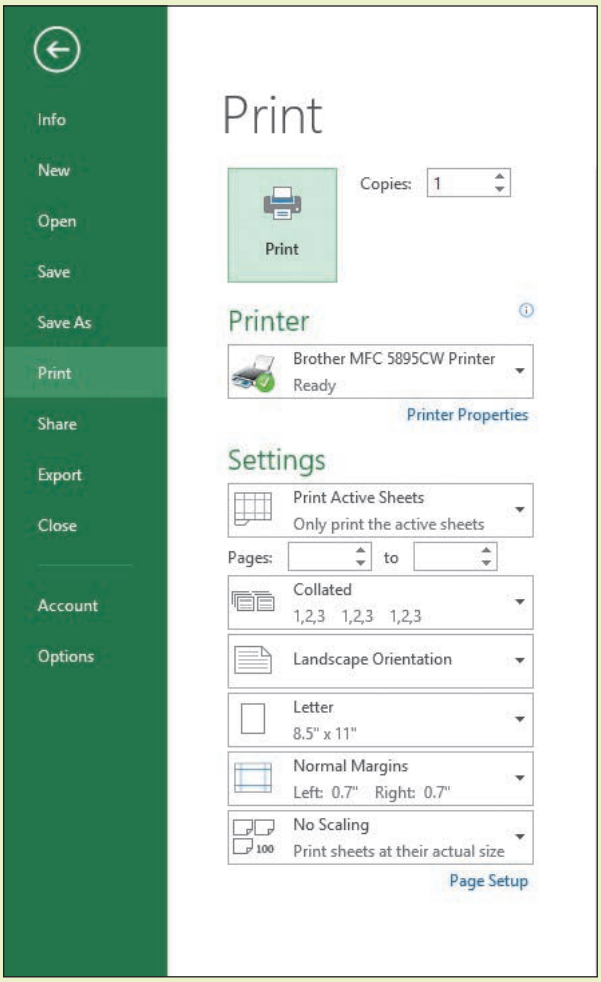
FIGURE 19–14
Page Setup dialog box

11. Click the **Collapse** button in the *Rows to repeat at top* box. The dialog box collapses, and the only option visible is the *Rows to repeat at top* box. In the worksheet window, select row **1**. Note that $1:$1 is displayed in the *Rows to repeat at top* box. In the *Rows to repeat at top* box, click the **Expand** button to expand the dialog box.

12. Make sure that in the *Print* section the **Row and column headings** option is enabled. At the bottom of the dialog box, click **Print Preview**. Backstage view opens. At the bottom of the Preview Pane, click the **Next Page** arrow to view all the pages. The column headings are displayed at the top of each page.

13. In Backstage view, shown in **Figure 19–15**, there are options for changing the settings. Under *Settings*, click **Print Active Sheets**. A menu appears with the options to print the active sheets, the entire workbook, or only the selection. There is even an option to ignore any print areas that have been set. Click **Print Active Sheets** again to close the menu.

FIGURE 19–15
Print options in Backstage view



14. Under *Settings*, click **Collated**. By default, Excel collates the printed pages for you. When you choose the Uncollated option, multiple copies of the first page are printed, then multiple pages of the next page are printed, and so on.

15. Press **Esc** twice to close the Collated menu and the Backstage view. Save the changes, and close the workbook.

Formatting the Cell Contents

2-3.2.4

An effective spreadsheet is well formatted, with consistent formatting of similar elements. Formatting the contents of a cell, like formatting in other Office applications, changes the way it appears. You can control the font styles, sizes, and colors, and you can apply attributes such as bold and italic. Border, color, and fill color formats are useful for highlighting important information.

When you use the Cut and Copy commands to copy and move all the data in a cell, the formats are also moved or copied. However, when you delete the contents of a cell using the Delete key or the Backspace key, the formats for the cell remain in the cell. Therefore, if you enter new data in the cell, the existing formats will apply to the new contents. To remove the contents and the formats, you need to clear the cell. You can clear the contents and the formats from the cell, clear only the contents, or clear only the formats.

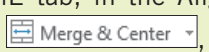
Merging Cells and Changing Font Styles and Sizes

There will be times when you want text to span across several columns. To do this, you can merge cells and combine several cells into a single cell. You can use merged cells to create a title or other informational text for your worksheet.

You learned in Lesson 13 that a font is the design of the typeface. Fonts are available in a variety of styles and sizes, and you can use multiple fonts in one workbook. The font size is a measurement in points that determines the height of the font. When you increase the font size, Excel automatically changes the row height to fit the font size, but you can also manually set the row height. However, Excel does not adjust the cell width when the font size changes. Bold, italic, underline, and color formats can also add emphasis to the contents of a cell. You can use the Format Painter feature to copy formats.

Step-by-Step 19.8

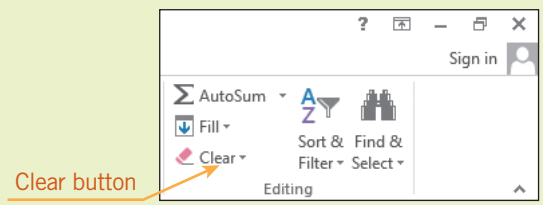
2-3.1.2
2-3.1.4
2-3.1.5
2-3.2.4

1. Open the file **Utilities** from the drive and folder where your Data Files folder is stored. Save the Utilities workbook as **Utilities Expenses 1**, followed by your initials.
2. Right-click the **Energy Use** worksheet tab. In the shortcut menu, click **Insert**. In the Insert dialog box, the Worksheet template is already selected. Click **OK**. Double-click the new **Sheet1** worksheet tab name, type **Bills** and then press **Enter**.
3. In cell A1, type **Utilities Expenses for 2016** and then press **Enter**.
4. Cell A2 is the active cell. Type **End of Billing Cycle**. Press **Tab**, type **Charges**, and press **Enter**.
5. Select columns **A** and **B**, and double-click the **right border** of the column B heading to use the AutoFit feature to automatically fit the column widths to the cell contents.
6. Select the range **A1:C1**. On the HOME tab, in the Alignment group, click the **Merge & Center** button arrow 

, and then click **Merge & Center**. The three cells are combined into a single cell, and the existing text in cell A1 is centered in this modified cell A1.

7. With cell A1 still selected, right-click the cell to show the Mini toolbar. Change the font to **Cambria, 14 point**. Also, apply the **Bold** format. The height of the cell is increased to accommodate the increased font size.
8. Select the range **A2:B2**. Change the font to **Cambria, 12 point**, and apply a **red** font color. The contents in cell B2 now extend beyond column B. Excel does not automatically adjust the column when you change the contents of the column. Use the AutoFit feature for column B.
9. Click cell **B2**, and press **Delete** to remove the contents. With the cell still active, type **Amount Paid** and then press **Enter**. The new text is formatted in red, 12-point Cambria. When you clear the contents of a cell, the formats applied to the contents of that cell are not removed. Apply the AutoFit feature for column B again.
10. Select the range **A2:B2**. In the Editing group shown in **Figure 19–16**, click the **Clear** button and then click **Clear Formats**. Deselect the cells. The font is restored to the default setting of Calibri 11-point font.

FIGURE 19–16
Editing group on the HOME tab



11. Select cell **A2**. Change the font to **Cambria, 12 point**, and apply the italic format.
12. Cell A2 is still selected. In the Clipboard group, click the **Format Painter** button. Then click cell **B2** to copy the font formats to the contents in cell B2.
13. Click anywhere in row **2**. In the Cells group, click the **Format** button, and then click **Row Height**. Type **100** in the *Row height* box, and click **OK**.
14. Save the changes, and leave the workbook open.

Changing Alignment and Wrapping Text in Cells

By default, Excel aligns text at the left of the cell and numbers at the right side of the cell. However, you can also center the cell contents. You can adjust the alignment of the content of a cell vertically as well. Your choices for vertical alignment are top, middle, and bottom. You will find buttons for all of these settings in the Alignment group on the HOME tab. You will also find some other interesting options, such as orientating text at an angle within the cell, and decreasing the margin between the edge of the cell and the cell contents. Also, if the text does not fit on one line, you can enable an option to allow the text to wrap to new lines within a cell.

When you move or copy all the data in a cell, the formats are also moved or copied. When you paste cell content that has been formatted, Live Preview shows you what the content will look like after it is pasted. As you preview the results, you can choose from several options in a menu. These menu options change based on the content you are pasting.

Step-by-Step 19.9

IC3
2-1.1.2
2-3.1.2
2-3.1.3
2-3.2.4

1. If necessary, open the file **Utilities Expenses 1** from your solution files. Save the Utilities Expenses 1 workbook as **Utilities Expenses 2**, followed by your initials. If necessary, select the **Bills** worksheet tab.
2. Select the range **A2:B2**. On the HOME tab, in the Alignment group shown in **Figure 19–17**, click the **Center** button. Then, in the Alignment group, click the **Middle Align** button. White space now appears above and below the headings in the cells.

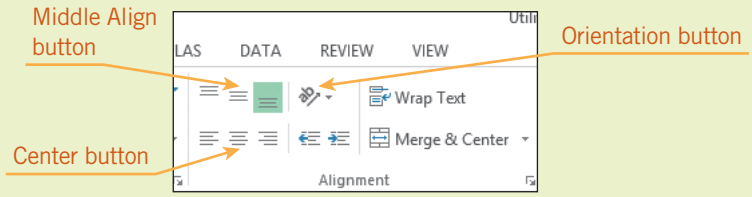


FIGURE 19–17
Alignment group on the HOME tab

3. With the cells still selected, in the Alignment group, click the **Orientation** button and then click **Angle Counterclockwise**. The headings are positioned at an angle within the cells.
4. Explore the other orientation settings by clicking the **Orientation** button and then selecting a new option until you have seen all the orientations in the cell. The last option in the menu opens the Format Cells dialog box where you can change the cell alignment.
5. Click the **Orientation** button, and then click the current highlighted option to toggle the orientation feature off. The cell contents are centered both vertically and horizontally within the cells.
6. Select the range **A2:C2**. In the Cells group, click the **Format** button, click **Row Height**, change the row height to **50**, and then click **OK**. Click cell **C2**, and apply the italic format.
7. With cell C2 selected, in the Alignment group, click the **Wrap Text** button to apply the format. The feature is highlighted on the Ribbon when enabled. Then, type **Increase/Decrease** and press **Enter**. As you enter the text, the contents, with the italic format applied, will wrap to a second line inside the cell.

QUICK TIP

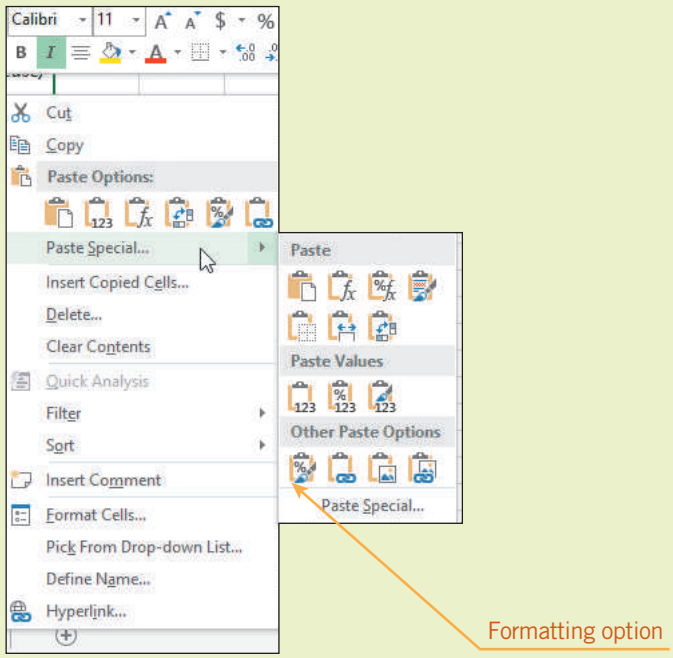
The keyboard shortcut Ctrl+1 opens the Format Cells dialog box. You can also access the Format Cells dialog box by right-clicking an active cell or range and then selecting Format Cells in the shortcut menu.

QUICK TIP

If you change your mind after pasting content, at the lower-right corner of the cell, you can click the Paste button arrow and then select a different Paste option.

8. Select cell **B2**. Copy the contents to the Clipboard. Right-click cell **C2**. In the shortcut menu, under *Paste Options*, point to *Paste Special*. A submenu appears as shown in **Figure 19–18**. Position the mouse pointer over each of the paste options. The results of each paste option are displayed in Live Preview. Under *Other Paste Options*, click the **Formatting** option. The existing text remains, and the formats from cell B2 are applied. Press **Esc** to remove the marquee.

FIGURE 19–18
Paste options



9. The wrap text format was removed from column C. Cell C2 should still be selected. Click the **Wrap Text** button. Because the font size is now 12 point, the text wraps to a third line. You cannot use the AutoFit feature when the wrap text feature is enabled. In the Cells group, click the **Format** button, and then click **Column Width**. Type **10** and then click **OK**.
10. Save the changes, and leave the workbook open for the next Step-by-Step.

Formatting Numbers and Dates

Generally, numbers are displayed with no formatting and are aligned on the right side of a cell. However, dates are automatically formatted in the default style (such as 20-Jan-14). You can easily change the format of number data.

Step-by-Step 19.10

2-3.1.3
2-3.2.3

1. If necessary, open the file **Utilities Expenses 2** from your solution files. Save the Utilities Expenses 2 workbook as **Utilities Expenses 3**, followed by your initials.
2. Click cell **A3**, type **January 20, 2016** and press **Enter**. In spite of how you entered the date, the default setting shows the date as *20-Jan-16*. And, the data is aligned at the right side of the cell.
3. Type **February 20, 2016** and press **Enter**. *20-Feb-16* is displayed in cell A4.
4. Select the range **A3:A4**. In the Number group on the HOME tab, shown in **Figure 19–19**, click the **dialog box launcher**. The Format Cells dialog box opens showing the Number tab.

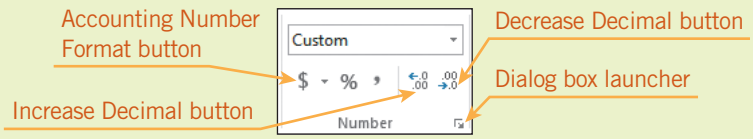


FIGURE 19–19
Number group on the HOME tab

5. In the *Category* list, click **Date** to show the options. In the *Type* list, click ***Wednesday, March 14, 2012**. When your settings match those shown in **Figure 19–20**, click **OK**. The content in cells A3 and A4 changes to the new format for the two dates you entered.

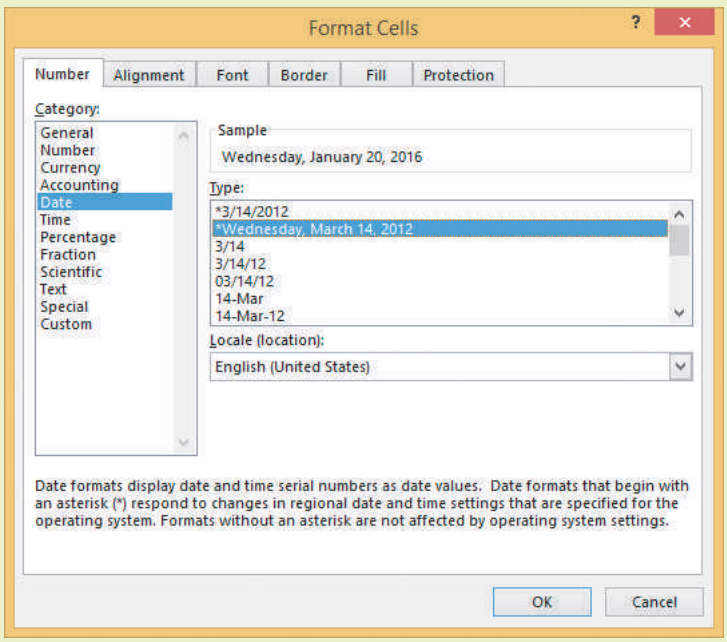


FIGURE 19–20
Format Cells dialog box

6. With the two cells still selected, click the **fill handle** and drag down to cell A14. When you see *Tuesday, December 20, 2016* in the ScreenTip on the side of the fill handle, release the mouse button.
7. Click cell **B3** and enter the following data in column B:

   384.99
   295.44
   228.91
   229.44
   145.59
   128.57
   210.31
   246.76
   190.61
   205.11
   225.40
8. Select the range **B3:B14**. (The last cell in the range should be empty, and cell B13 shows *225.4* instead of *225.40*.) In the Number group, click the **Accounting Number Format** button $. Cell B13 now shows *225.40*. Notice there is extra white space between the dollar sign and the numbers. With the range of cells still selected, in the Number group, click the **dialog box launcher**. In the Category list, click **Currency**. The Decimal places setting should be 2, and the example should show *$384.99*. Click **OK**.
9. Even though there is no content in cell B14, you applied the format. Click cell **B14** and type **297.45**. Press **Enter** (or Tab), and the currency format with two decimals is applied to the contents in the cell.
10. Select the range **C3:C14**. In the Number group, click the **dialog box launcher**. Under *Category*, click **Percentage**. If necessary, change the Decimal places setting to **2**. Click **OK**.

11. Click cell **C3** and type **10.66**. As you enter the numbers, the percent symbol appears in the cell. Press **Enter**, and continue entering the following data in column C:

    9.55
    10.25
    11.06
    –4.51
    6.92
    8.35
    9.12
    –6.85
    8.35
    –1.19
    –1.25

12. Click cell **C3**, and then in the Number group click the **Decrease Decimal** button  . The number changes to *10.7*. The digit was rounded up to the nearest tenth. Click the **Decrease Decimal** button again. The number is rounded up to *11*.
13. With cell C3 still selected, click the **Increase Decimal** button  twice to restore the number to two decimal places so *10.66%* is displayed in the cell. Deselect the cell.
14. Save the changes, and leave the workbook open for the next Step-by-Step.

Applying Conditional Formatting

You can quickly identify exceptions or trends in data and unusual cell values by applying conditional formatting. ***Conditional formatting*** applies designated formats to cells when the cell value meets specified conditions (criteria). You can highlight cell values with borders, fill colors, and font colors. You can also use Data Bars, Color Scales, or Icon Sets to help visualize the data. Several built-in rules are available so you can specify criteria based on a comparison operator or criteria based on a cut-off value.

VOCABULARY
conditional formatting

Step-by-Step 19.11

2-1.2.1
2-3.2.4

1. If necessary, open the file **Utilities Expenses 3** from your solution files. Save the Utilities Expenses 3 workbook as **Utilities Expenses 4**, followed by your initials.
2. Select the range **C3:C14**. On the HOME tab, in the Styles group shown in **Figure 19–21**, click the **Conditional Formatting** button, point to *Highlight Cells Rules*, and in the submenu click **Duplicate Values**.

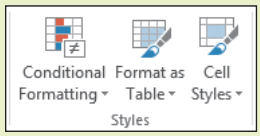


FIGURE 19–21
Styles group on the HOME tab

3. The Duplicate Values dialog box opens. Click the **values with** list arrow, and then click **Green Fill with Dark Green Text**. Click **OK**. Deselect the cells. The duplicate values in cells C9 and C12 are highlighted.
4. Select the range **B3:B14**. Click the **Conditional Formatting** button, point to *Top/Bottom Rules*, and then in the submenu click **Above Average**. The Above Average dialog box opens. Leave the settings as is, and click **OK**. Deselect the cells. Excel calculated the average amount for the selected cells and identified four values above average.
5. Click the **Conditional Formatting** button, point to *Clear Rules*, and then in the submenu, click **Clear Rules from Entire Sheet**. All the conditional formats are removed.
6. If necessary, select the range **B3:B14**. Click the **Conditional Formatting** button, and point to *Data Bars*. In the submenu, position the mouse pointer over the thumbnails to preview the results. Under *Gradient Fill*, click the first option, **Blue Data Bar**. Deselect the cells. The data bars provide a visual for comparing the data in the column.
7. Select the range **A3:A14**. Click the **Conditional Formatting** button, and point to *Color Scales*. In the submenu, position the mouse pointer over the thumbnails to preview the results. Two-color and three-color scales can be used to create a visual of the values, such as the change in seasons. At the bottom of the submenu, click **More Rules** to open the New Formatting Rule dialog box.

ABOVE AND BEYOND

If the built-in rules for conditional formatting do not meet your needs, you can create your own conditional formatting rules. Click the Conditional Formatting button, choose the New Rule command, and set the formats in the New Formatting Rule dialog box, where you can edit the rule description and customize the formats.

8. Click the **Format Style** list arrow, and select **3-Color Scale**. Under *Minimum*, click the **Color** list arrow, and select the standard color **Blue**. If necessary, under *Midpoint*, change the Color setting to the standard color **Yellow**. Under *Maximum*, change the Color setting to the standard color **Orange**. When your settings match those shown in **Figure 19–22**, click **OK**.

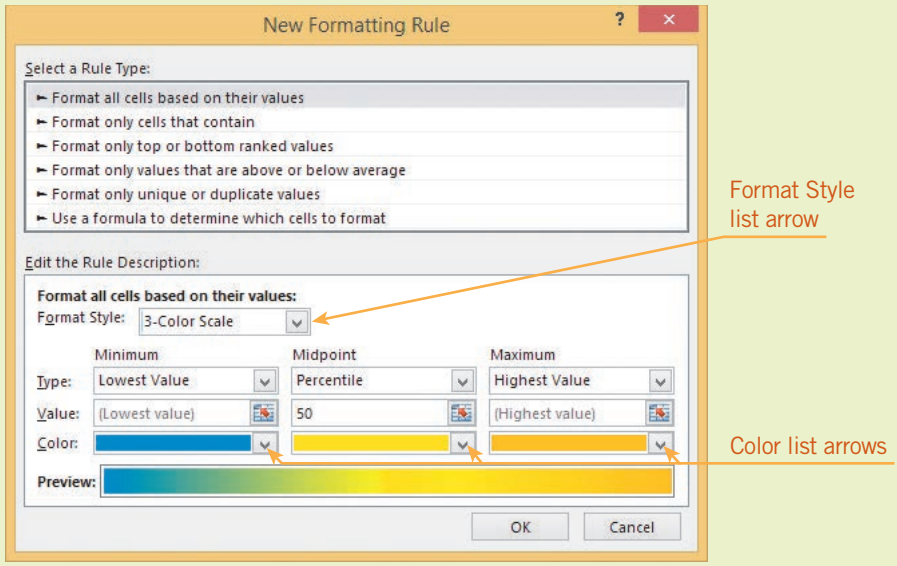


FIGURE 19–22
New Formatting Rule dialog box with custom settings

9. Select the range **C3:C14**. Click the **Conditional Formatting** button, and point to *Icon Sets*. In the submenu shown in **Figure 19–23**, move the mouse pointer over the options to see the Live Preview of the options. Then in the *Directional* category, click the **5 Arrows (Colored)** option. Icons are added to the selected cells to highlight the data.

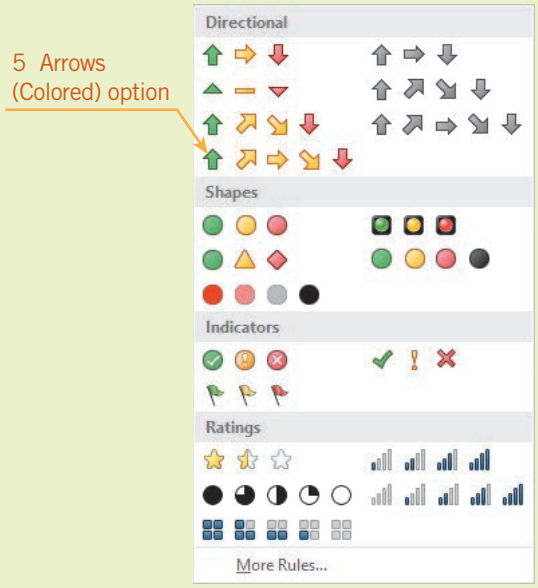


FIGURE 19–23
Icon Sets submenu

10. With the range C3:C14 still selected, click the **Conditional Formatting** button, point to *Highlight Cells Rules*, and in the submenu click **Greater Than**. The Greater Than dialog box opens. Type **10.00%** and then click **OK**. Deselect the cells.
11. Select the range **A3:A14**. Click the **Conditional Formatting** button, point to *Clear Rules*, and in the submenu click **Clear Rules from Selected Cells**.
12. Deselect the cells. Save the changes, and leave the workbook open for the next Step-by-Step.

Adding Fill Colors, Borders, and Styles

You can emphasize important information in a cell, a row of cells, or a column by applying fill colors and/or border formats. You can use the Format Painter to copy the format of a worksheet cell without copying the contents of the cell. For example, after applying a date format in one cell, you may format other cells for dates by painting the format.

VOCABULARY
cell style
table style

A ***cell style*** is a set of predefined formats you can apply to some of the worksheet data, such as a header row, a cell showing a total, or cells showing the date and time. To apply a cell style, you must first select a cell or a range of cells to be formatted. Excel offers more than 40 styles in the Cell Styles gallery that enable you to apply multiple formats quickly and consistently.

A ***table style*** is a set of predefined formats that you can apply to all the worksheet data with a single click. When you apply a table style, the selected cells are converted to an Excel table. When you convert a range of cells to an Excel table, you can easily and quickly format the table data. You can choose from 60 table styles in the Quick Styles gallery. If you do not want to work with the data in a table format, you can convert the table to a regular range and the table style format will remain intact.

ABOVE AND BEYOND

After converting a range of cells to an Excel table, you can manage and calculate the table data independently of any data outside of the table.

The cell styles and table styles may override some or all existing formats that you have applied. If desired, you can modify styles after they are applied, and you can save your own customized styles.

Step-by-Step 19.12

IC3
2-1.2.1
2-3.1.2
2-3.2.4

1. If necessary, open the file **Utilities Expenses 4** from your solution files. Save the Utilities Expenses 4 workbook as **Utilities Expenses 5**, followed by your initials.
2. Click cell **A1**. On the HOME tab, in the Font group, click the **Fill Color** button arrow. Under *Standard Colors*, click the **Yellow** color.
3. Cell A1 should still be the active cell. In the Font group, click the **Border** button arrow, and then under *Draw Borders*, point to *Line Color*. Under *Theme Colors*, in the first row, click **Dark Blue, Text 2** color. The mouse pointer changes to a pencil.

4. Although cell A1 is no longer highlighted, it is still the active cell. Click the **Border** button arrow, and then under *Draw Borders*, point to *Line Style*. In the submenu, click the first **double-line** border style. To apply the defined border, click the **Borders** button arrow, and then click **Bottom Border**. Deselect the cell. A dark blue, double line is added to the bottom of cell A1.
5. Click cell **A1**. In the Styles group, click the **Cell Styles** button. The Cell Styles gallery of predefined styles, shown in **Figure 19–24**, opens. Move the mouse pointer over the options to see the Live Preview of the styles.

QUICK TIP

When you choose a border line format and the mouse pointer changes to a pencil, you can apply the current border format to one or more of the cells in the worksheet by clicking the cell borders.

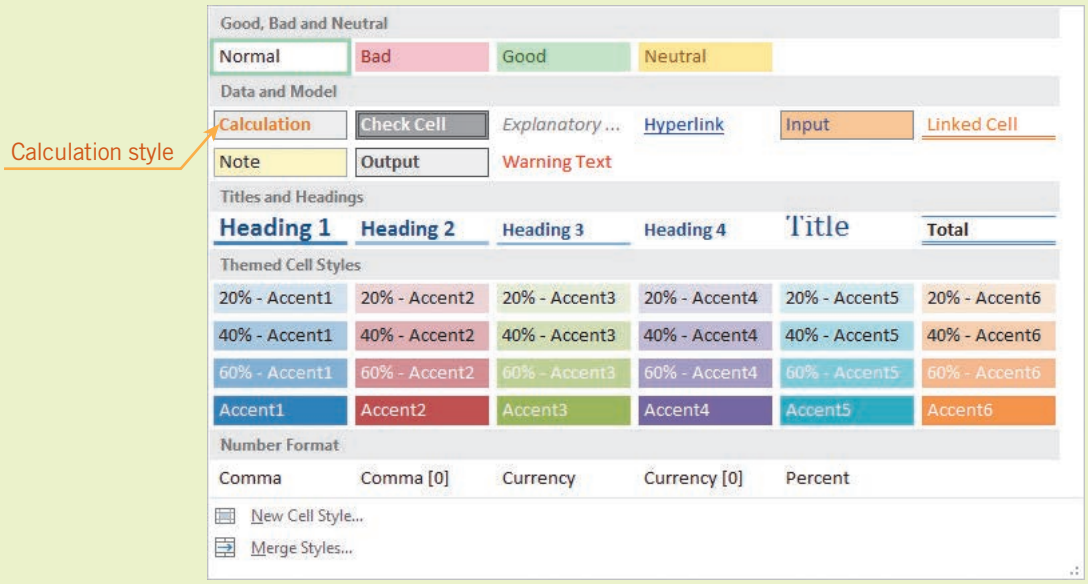
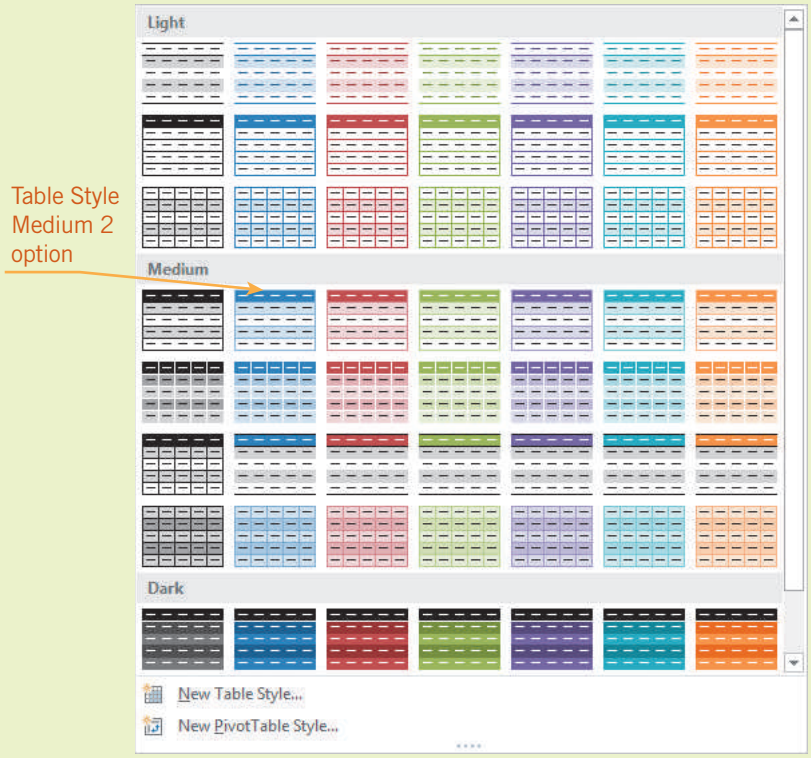


FIGURE 19–24
Cell Styles gallery

6. Click the **Calculation** cell style. Deselect the cell. The border line and fill color you applied is replaced with the Calculation cell style format. Select cell **A1**, and change the font size to **14 point**.
7. Select the range **A2:C2**. Click the **Cell Styles** button, and then click the **Heading 4** cell style. Deselect the row. The style is applied to row 2. Select cell **C2**. In the Formula Bar, position the insertion point between / and D. Press the **spacebar** and then press **Enter** to control where the line of text wraps in the cell.

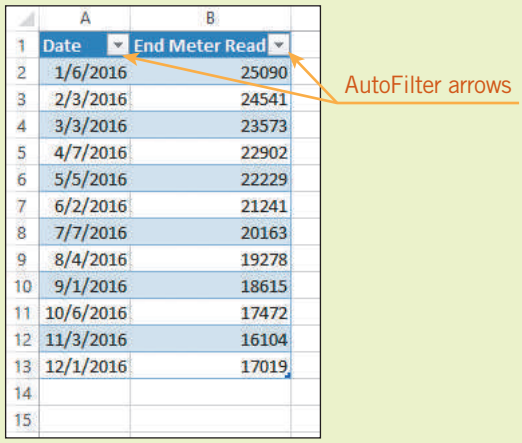
8. Click the **Energy Use** worksheet tab. Select the range **A1:B13**. In the Styles group, click the **Format as Table** button. The Quick Table Styles gallery shown in **Figure 19–25** opens. In the Medium group, in the first row, click the **Table Style Medium 2** table style.

FIGURE 19–25
Quick Table Styles gallery



9. The Format As Table dialog box opens. The dialog box shows the range of the selection. Make sure the **My table has headers** option is enabled so the header rows will show different formats. Click **OK**. The TABLE TOOLS DESIGN tab is now displayed on the Ribbon when the table is selected. You can access the Quick Table Styles gallery by clicking the More button in the Table Styles group.

10. Click outside the table to deselect the cells. As shown in **Figure 19–26**, some fill color is added to the cells, and the font color in the column headings is changed to white. You will see there are arrows in the header row, as indicated in Figure 19–26. You will learn more about using these AutoFilter arrows in the next section.



	A	B
1	Date	End Meter Read
2	1/6/2016	25090
3	2/3/2016	24541
4	3/3/2016	23573
5	4/7/2016	22902
6	5/5/2016	22229
7	6/2/2016	21241
8	7/7/2016	20163
9	8/4/2016	19278
10	9/1/2016	18615
11	10/6/2016	17472
12	11/3/2016	16104
13	12/1/2016	17019
14		
15		

FIGURE 19–26
Worksheet data formatted as a table

11. To convert the table back to a range, click anywhere within the table. If necessary, click the **TABLE TOOLS DESIGN** tab. In the Tools group, shown in **Figure 19–27**, click the **Convert to Range** button. When prompted to convert the table to a normal range, click **Yes**. The arrows in the column headings disappear, but the fill color and font colors remain the same. Also, the TABLE TOOLS DESIGN tab disappears.

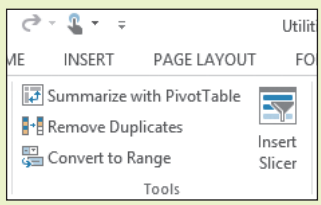


FIGURE 19–27
Tools group on the TABLE TOOLS DESIGN tab

12. Save the changes, and leave the workbook open for the next Step-by-Step.

QUICK TIP

An alternate way to convert table cells back to a normal range is to right-click the table and in the shortcut menu point to Table, and then in the submenu click Convert to Range. Then click Yes to confirm.

Sorting and Filtering Data

Worksheets can function as basic databases. You can sort the data and numbers in the columns based on one criteria or on multiple criteria. To sort worksheet data, you must indicate the column on which you want to base the sort. If the worksheet has multiple columns of data, you can base the sort on data in as many as three different columns. For example, you can sort the worksheet contents first by the column C data, then by column A data, and then by column B data.

In addition to sorting data, you can filter worksheet data. When you ***filter*** data, you screen data that matches specified criteria. The data that does not meet the criteria is hidden, and only the data that meets the criteria is shown.

VOCABULARY
filter

Step-by-Step 19.13

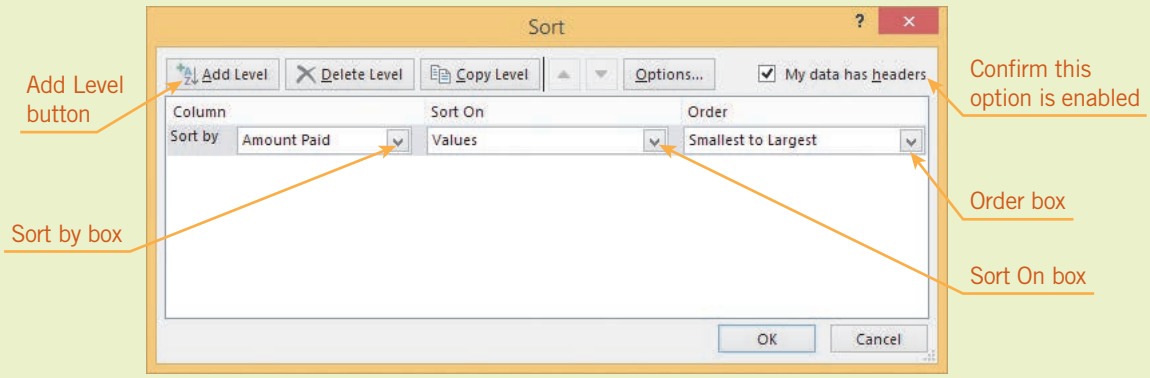
IC3 2-3.2.1

1. Open the file **Utilities Expenses 5** from your solution files. Save the Utilities Expenses 5 workbook as **Utilities Expenses 6**, followed by your initials.
2. Click the **Bills** worksheet tab. Select the range **B3:B14**. On the HOME tab, in the Editing group, click the **Sort & Filter** button. Click **Sort Smallest to Largest** to arrange the data so the lowest amounts paid are at the top of the column. A Sort Warning dialog box opens. Under *What do you want to do?*, click the **Continue with the current selection** option, and then click **Sort**. The selected data is rearranged in the column, but the associated data in columns A and C do not move. Click the **Undo** button.
3. The range B3:B14 should still be selected. Click the **Sort & Filter** button, and then click **Sort Smallest to Largest**. In the Sort Warning dialog box, leave the *Expand the selection* option enabled, and click **Sort**. The data in column B is rearranged, and the associated data in columns A and C move with the data in column B. Deselect the data.
4. To sort by multiple criteria, you must open the Sort dialog box. Click any cell containing a value. Click the **Sort & Filter** button, and then click **Custom Sort**. The Sort dialog box shown in **Figure 19–28** opens. By default the *My data has headers* option is enabled. When this option is enabled, Excel will not include the headers in the sort.

QUICK TIP

If your Sort dialog box shows one or more Then by rows, click Delete Level at the top of the dialog box to remove the levels.

FIGURE 19–28
Sort dialog box



5. Under *Column*, click the **Sort by** list arrow, and then click **Increase/ Decrease**. Under *Sort On*, the box should already show the option *Values*. Under *Order*, click the **list** arrow, and then click **Largest to Smallest** to sort the data with the highest value at the top of the column.
6. At the top of the dialog box, click **Add Level**. A *Then by* box appears under *Column*, as shown in **Figure 19–29**. Click the **Then by** list arrow, and click **Amount Paid**. The *Sort On* option should be set to *Values*. Under *Order*, click the **list** arrow, and then click **Largest to Smallest**. With these settings, if two percentages are the same, the order will be determined by the amount paid shown in column B.

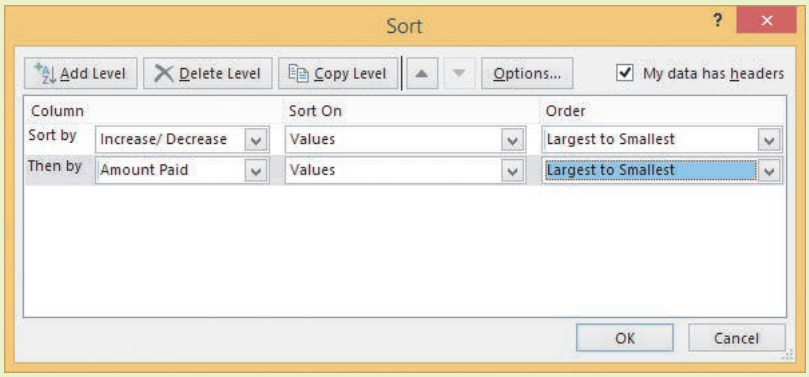
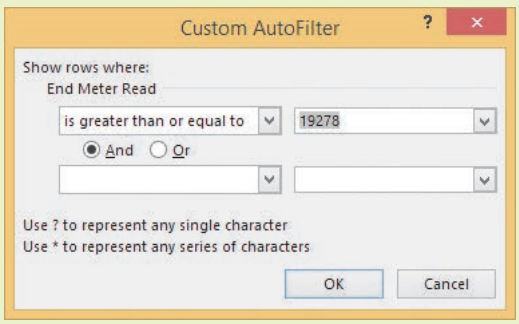


FIGURE 19–29
Sort settings for multiple columns

7. When your settings match those in Figure 19–29, click **OK** to accept the settings. Look at rows 8 and 9. Both rows show *8.35%* in column C, so the order is based on the data in column B. The row with the amount *$210.31* was placed above the row with the amount *$205.11* because the data is arranged from largest to smallest.
8. Click the **Energy Use** worksheet tab. If necessary, click any one of the cells containing data. On the HOME tab, in the Editing group, click the **Sort & Filter** button, and then click **Filter**. The AutoFilter arrows are displayed in the column heading cells.
9. Click the **AutoFilter** arrow in column A and a submenu opens. Under *Date Filters*, click the **(Select All)** check box to deselect all the options. Click the **March** check box to filter out all entries that were not in March, and then click **OK**. Only one entry matches the criteria. Notice the row numbers at the left. Rows 2 and 3 and rows 5–13 are hidden because they do not contain data that meets the criteria.

10. Click the **Sort & Filter** button, and then click **Filter** to toggle the AutoFilter feature off. All the rows appear again.
11. Click the **Sort & Filter** button, and click **Filter**. Click the **AutoFilter** arrow in column B, and then point to *Number Filters*. In the submenu, click **Greater Than Or Equal To**. The Custom AutoFilter dialog box opens.
12. The insertion point is positioned in the first blank box. Click the **list** arrow in the box, and then scroll down the list of all the values in the column. Click **19278**. Your dialog box should look like the one shown in **Figure 19–30**.

FIGURE 19–30
Custom AutoFilter dialog box



13. Click **OK**. Only those rows with an end meter reading equal to or higher than *19278* appear in the worksheet.
14. Save the changes, and leave the workbook open for the next Step-by-Step.

Sharing Workbooks

In a team effort to create and maintain a workbook, it is common for multiple users to access and edit the workbook. It is also common to share workbook data without allowing edits. Excel offers several options for sharing workbooks.

ABOVE AND BEYOND

To share a workbook, you can make the file available by uploading it to a network location or a SkyDrive folder. Multiple users can make changes, and then you merge the data from their copies back into the original file. To prevent people from opening your workbooks, you can apply a password.

Tracking Changes and Adding Comments

When you track changes in Excel, cells are highlighted and details about the change can be viewed in a ScreenTip. Then you can either accept or reject those changes. You can view a history of all the detailed changes in a separate worksheet both before and after the changes are accepted or rejected. By default, the change history is saved for 30 days. When you enable the setting to track changes in a workbook, the workbook automatically becomes a shared workbook. When you toggle off the change tracking feature, or when you stop sharing the workbook, all change history is permanently deleted.

You can also add comments to selected cells. The annotations display in a ScreenTip, but they do not appear on the history worksheet.

Step-by-Step 19.14

1. If necessary, open the file **Utilities Expenses 6** from your solution files. Save the Utilities Expenses 6 workbook as **Utilities Expenses 7**, followed by your initials.
2. Click the **eServices** worksheet tab. Click the **REVIEW** tab. In the Changes group shown in **Figure 19–31**, click the **Track Changes** button and then click **Highlight Changes**.

IC3
2-1.2.1
2-1.3.2
2-6.1.1
2-6.1.2
2-6.1.3

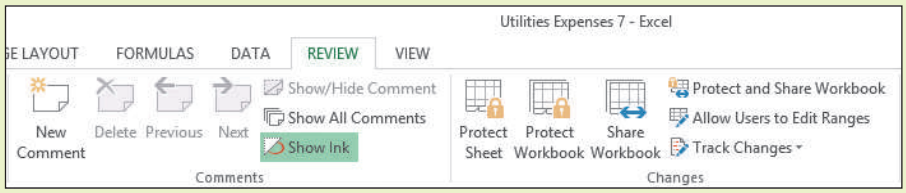


FIGURE 19–31
Comments and Changes groups on the REVIEW tab

3. The Highlight Changes dialog box shown in **Figure 19–32** opens. Click the **Track changes while editing. This also shares your workbook.** check box. Click the **Collapse Dialog Box** button and then in the worksheet window select the range **A1:B4**. After selecting the range, press **Enter**. The selected range is entered in the *Where* box. When your dialog box matches Figure 19–32, click **OK**. When prompted to save the workbook, click **OK**.

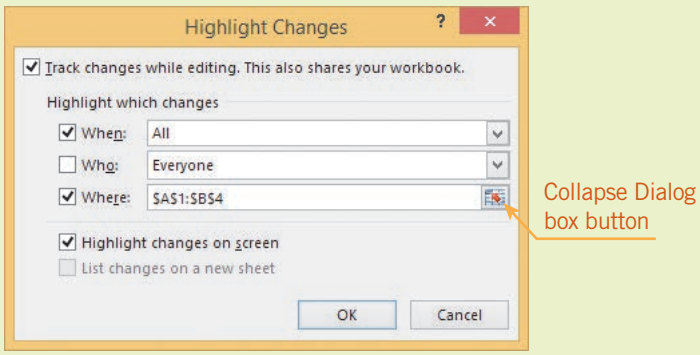


FIGURE 19–32
Highlight Changes dialog box

4. Click cell **B3**, type **EP342** and press **Enter**. Cell B4 is the active cell. Type **EP!1*3#** and press **Enter**. The labels for rows 3 and 4 are formatted red, and a dark blue triangle shape displays in the upper-left corner of cells B3 and B4, indicating that changes were made.
5. Click cell **B3**. In the Comments group, click the **New Comment** button. A comment box opens. Type **Monthly update**. Then click anywhere outside the comment box to close the comment box. The column B label is formatted red, and a red triangle shape displays in the upper-right corner of the active cell, indicating a comment exists. The highlights provide a quick glance at where changes and comments are made.

6. Point to cell *B3*. A ScreenTip displays the user name, a description of the edit, and the comment added to the cell. Point to cell *B4*. A description of the change displays in a ScreenTip.
7. Save the changes to the workbook.
8. Click the **Track Changes** button and then click **Highlight Changes**. Click the **List changes on a new sheet** checkbox to enable the option. Click **OK**. A new *History* worksheet tab is added to the workbook providing details about all of the changes. You can see who made the changes, the type of change, where and when the changes were made, and what data was added or deleted.
9. Save the workbook as **Utilities Expenses 8**, followed by your initials.
10. Click the **eServices** worksheet tab. In the Changes group, click the **Track Changes** button and then click **Accept/Reject Changes**. The Select Changes to Accept or Reject dialog box opens. Click **OK**. Then the Accept or Reject dialog box opens, showing the first of the two changes. Click **Accept All**.
11. Click cell **B3**. The comment displays. In the Comments group, click the **Delete** button. The comment is removed from the worksheet.
12. Save the changes and close the workbook. Reopen the file **Utilities Expenses 8** from your Solutions folder. Click the **eServices** worksheet tab. Note that the highlights for tracked changes no longer display.
13. If necessary, click the **REVIEW** tab. In the Changes group, click the **Track Changes** button and then click **Highlight Changes**. Click the **When** box arrow and then click **All**. Click the **List changes on a new sheet** checkbox and then click **OK**. Click the **History** worksheet, if necessary. Note that even though you accepted the changes, the history is maintained.
14. Close the workbook, and when prompted to save changes, click **Don't Save**.

QUICK TIP

When the workbook is protected, you cannot remove the history entries.

Saving a Workbook to Share

When sharing workbooks with others, you need to consider that not all users will be using Excel 2013. Before distributing the soft copy of a workbook, you may need to save it in a format that enables those working with different applications, platforms, and operating systems to access the file. For example, you can save a workbook in a file format for an earlier version of Excel, but in order to make the file compatible with the earlier software version, you may lose some functionality.

A convenient way to share a workbook is to upload the workbook to a network where files are uploaded to a library on the Internet. When signed into your Microsoft Account, you can use SkyDrive to store and share your files. You can also share a workbook by attaching the workbook to an e-mail message. You can choose to save the attached workbook in either a PDF or an XPS file format. Both PDF and XPS formats are designed to preserve the visual appearance and layout of each page, and they enable fast viewing and printing. By default, when you save a workbook in the PDF/XPS format, only the active worksheet is saved in the new file. To include multiple worksheets in the PDF or XPS file, you must select the additional worksheets. Each worksheet begins on a new page in the PDF/XPS file.

Step-by-Step 19.15

IC3
2-1.3.1
2-1.3.2
2-6.2.1
2-6.2.2
2-6.2.3

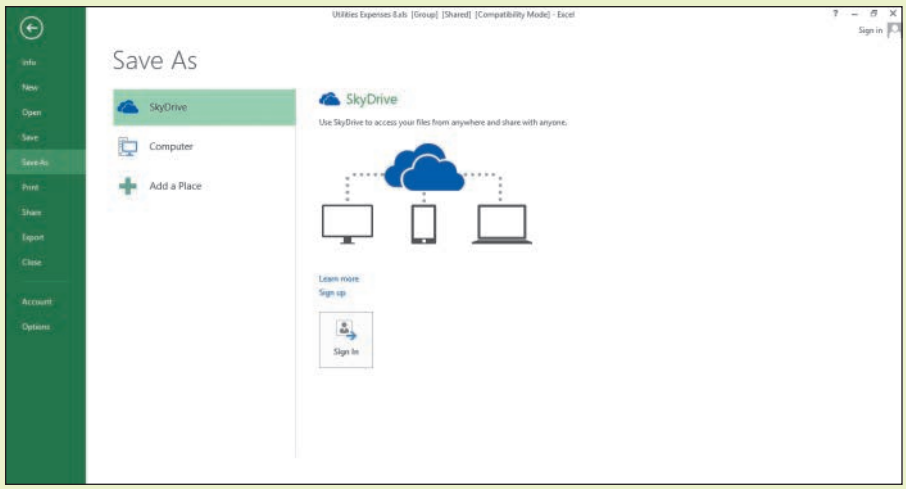
1. Open the file **Utilities Expenses 8** from your solution files. Click the **FILE** tab and then click **Save As**. Navigate to the drive and folder where you save your solution files. Click the **Save as type** box arrow and then click **Excel 97-2003 Workbook (*.xsl)**. Leave the file name as is. Click the **Save** button in the dialog box.
2. The Microsoft Excel – Compatibility Checker dialog box opens explaining loss of function. Click **Continue**. When prompted to save the workbook in an earlier version of Excel, click **OK**. Note that the title bar now shows the filename *Utilities Expenses 8 [Shared] [Compatibility Mode] - Excel*.
3. If necessary, click the **Bills** worksheet tab. Press and hold **Shift**, and then click the **Energy Use** worksheet tab. You do not want to include the *eServices* worksheet tab in the selection, because that worksheet contains confidential information that you do not want to share.
4. Note that the title bar for the Excel window now displays *Utilities Expenses 8 [Group] [Shared] [Compatibility Mode] - Excel*. Also, the selected worksheet tabs have green underlines.
5. Click the **FILE** tab, and then click **Save As**. Navigate to the drive and folder where you save your solution files. In the Save as type box, select the **XPS Document (*.xps)** format. Leave the file name as is. Click **Save**.
6. The workbook opens in the XPS Viewer. Note that the document has two pages. The *Bills* worksheet data appears on the first page. Scroll down to the second page. The filtered data is displayed on a separate page because it is stored in a separate worksheet. Press **Alt+F4** to close the XPS Viewer window. If necessary, click the **Desktop** tile on the Windows Start screen.

QUICK TIP

To select two or more nonadjacent worksheets, click the worksheet tab for the first worksheet, press and hold Ctrl, and then click the worksheet tabs of the other worksheets. To select all sheets in a workbook, right-click a worksheet tab and then click Select All Sheets.

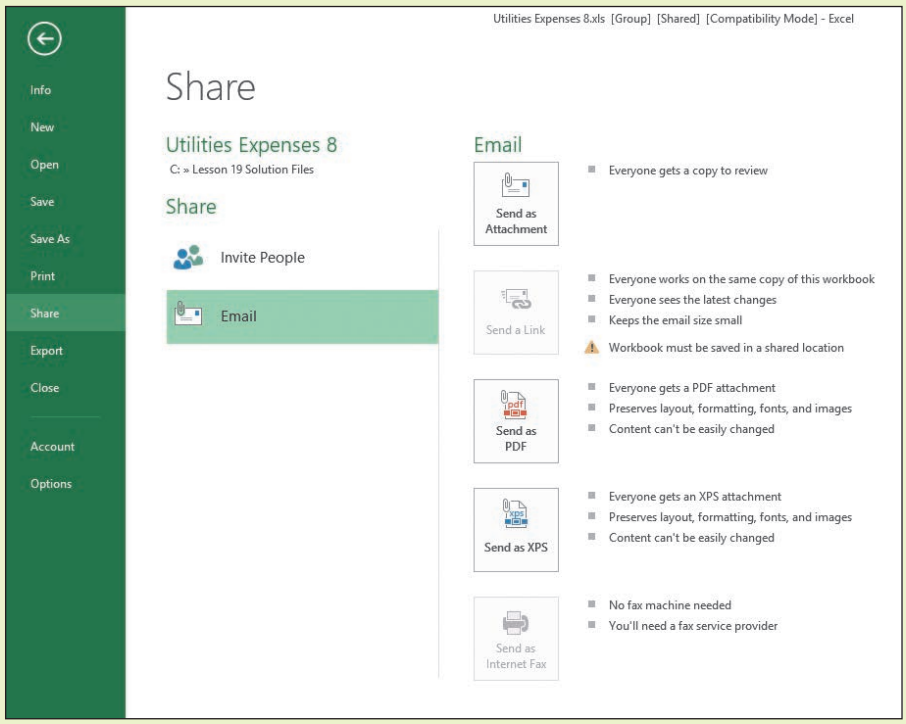
7. The **Utilities Expenses 8** workbook should still be open. Click the **FILE** tab, and then click **Share**. In the middle pane, *Invite People* is already selected. At this point you would click the Save To Cloud button. If it is the first time you have uploaded a document to the Cloud, you would be prompted to sign into your Windows Live account as shown in **Figure 19–33**. Once you are signed in to SkyDrive, a Save As dialog box opens and you have access to folders in your personal library in the Cloud. You can then select the folder where you want to save the workbook and then complete the process to save the file.

FIGURE 19–33
Sign in to the Cloud



8. In the Navigation pane, under *Share* click **Email**. Several options are displayed, as shown in **Figure 19–34**.

FIGURE 19–34
Share using Email



9. In the right pane, click the **Send as Attachment** button  . If Microsoft Outlook is your default e-mail application, the Outlook application will open and a new message window opens. If Outlook is not your default e-mail application, most likely your e-mail application will open with a new message form. (If a prompt displays that an e-mail account is not set up or that mail could not be sent, click OK.) If a message window opened, the Utilities 8 workbook is already attached to the e-mail message and the subject line displays the workbook filename. Close the message window without saving any changes.
10. Close the workbook and Excel. If prompted to save changes to the workbook, click **Don't Save**.

TECHNOLOGY CAREERS

Computer Software

Have you ever seen a community theater musical, attended a concert, or enjoyed a touring company's production of a popular show? The performers on stage could not entertain you without the help of a talented group of stage technicians who depend on computer technology to do their jobs. The lighting, sound, and stage sets of a theatrical production all use specialized computer programs to create the special effects. But stage technicians also use more common types of computer software to do their jobs. For example, the property manager, who tracks the props used in a show, can keep track of hundreds of small items using a spreadsheet program such as Excel that identifies which actor uses a prop in which scene, as well as where the prop is stored. The stage manager depends on a note-taking program to keep track of the director's staging instructions. Long-distance collaboration is common and a designer may work online with technicians across the country to view designs and exchange e-mails to quickly contact coworkers.

SUMMARY

In this lesson, you learned:

- To keep the header row in view when navigating through a large worksheet, you can change the zoom setting. If that does not work because the worksheet is too large, you can hide some of the rows and columns so you can focus on a particular range of data, or you can freeze some rows and columns.
- You can delete or add one or several worksheets to a workbook, and you can rename each worksheet.
- Headers and footers can be added to worksheets to provide information such as the source and date of the data.
- You can change the page orientation or use the Fit to feature to fit all the data on a specified number of pages.
- You can control the print output by inserting page breaks manually or creating a print area for the worksheet. With the default settings, the gridlines and row and column headings appear on the screen in worksheets but they do not appear when the worksheets are printed. You can change the settings to hide these elements on the screen and/or include them in printed worksheets.
- Before you print, you can preview the worksheet to see what it will look like when it is printed. You can choose to print the active worksheet only, or you can choose to print all worksheets in the workbook.
- There are many options available for formatting cell contents, including merging cells, changing font styles and sizes, changing the alignment within the cells, and applying number and date formats. Conditional formatting enables you to quickly identify exceptions or trends in data as well as unusual cell values.
- To enhance the appearance and highlight data within the worksheet, you can add borders and fill colors to cells. There are also many predefined styles available that you can quickly apply to give the worksheet a professional look and make reading the data easier.
- To organize worksheet data numerically or alphabetically, you can sort the data based on a single column, or you can sort the data based on multiple criteria. To screen for data that meets certain criteria, you can filter the data.
- You can track changes and add comments to worksheets. To preserve the visual appearance and layout of each worksheet, you can save all the workbook data in a PDF or an XPS file format.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. When the workbook has multiple worksheets with data, each worksheet begins on a new page in the PDF/XPS file.

T F 2. If you do not want to print all the worksheet data, you can identify the range you want to print before you choose the Print command.

T F 3. Excel automatically adjusts the cell width when the font size changes.

T F 4. When you use the Cut and Copy commands to copy and move all the data in a cell, the formats are also moved or copied.

T F 5. When you delete the contents of a cell using the Delete key or the Backspace key, the formats for the cell are also removed.

T F 6. When you increase the font size for cell content, Excel automatically adjusts the row height to fit the font size.

T F 7. If the worksheet has multiple columns of data, you can base the sort on data in as many as three different columns.

T F 8. When you apply a table style, the selected cells are converted to an Excel table.

T F 9. When you change the page setup settings in a worksheet, the new settings apply to all the other worksheets in the workbook.

T F 10. Conditional formatting helps you quickly identify exceptions or trends in data as well as unusual cell values.

MULTIPLE CHOICE

Select the best response for the following statements.

1. To span text across multiple columns, _____.
   A. create a header
   B. split multiple cells
   C. insert a header row
   D. merge multiple cells
2. You can insert fields in headers and footers to automatically print a _____.
   A. date
   B. filename
   C. file path
   D. all of the above
3. To sort worksheet data, you must indicate the _____ on which you want to base the sort.
   A. column(s)
   B. row(s)
   C. heading(s)
   D. criteria
4. Using default settings, _____ will be printed.
   A. gridlines
   B. column letters
   C. row numbers
   D. none of the above
5. When you _____ data, only the data that meets the criteria will be shown.
   A. freeze
   B. conditionally format
   C. filter
   D. sort
6. To keep a row and/or column visible as you scroll through a worksheet, you can _____ the row and/or column.
   A. split
   B. freeze
   C. lock
   D. all of the above
7. The _____ command scales the percentage of magnification of the worksheet.
   A. Zoom
   B. Size
   C. Page Width
   D. View Page
8. To switch to a different worksheet in a workbook, click the _____ at the bottom of the worksheet window.
   A. New sheet button
   B. worksheet tab
   C. worksheet button
   D. Next worksheet button
9. _____ orientation is the default page setting in Excel.
   A. Portrait
   B. Landscape
   C. Fit to command
   D. Normal
10. You can easily change the print settings using commands in the _____.
    A. Backstage view
    B. Page Setup dialog box
    C. Page Setup group on the PAGE LAYOUT tab
    D. all of the above

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What are some common uses of spreadsheets?

2. What are the advantages of working with electronic spreadsheets, such as Microsoft Excel?

3. What is the purpose of splitting a worksheet?

4. What are the advantages of converting a range of cells to a table?

5. What is the advantage to using fields instead of manually entering information in headers and footers for dates, times, filenames, and paths?

PROJECTS

PROJECT 19–1

2-1.1.4
2-1.2.1
2-1.2.2
2-1.3.1
2-1.3.2
2-3.1.2
2-3.1.3
2-3.1.5
2-3.2.3
2-3.2.4

1. Open **Courses** from the drive and folder where your Data Files folder is stored. Save the Courses workbook as **Revised Courses**, followed by your initials.
2. Someone has mistakenly formatted the class numbers with 1000s separators. Use the Clear command to clear formats only from cells B2:B7. Then center all the numbers in the column.
3. Insert a new column to the left of column B. The new column will be very wide since it defaults to the width of the column before it. Do not be concerned. You will adjust the width later. In cell B1, type the column heading **Fee**.
4. In cell B2, type **120**. Format this number for **Currency** with no decimal places, and center the number in the cell.
5. Fill down to cell B7 with the number and format in cell B2. Use AutoFit on the column width.
6. Select the range **D2:G7**, and format the cells so the contents align at the right.
7. Insert a new row above the header row. Merge and center cells A1:H1, and type the heading **Language Courses**.
8. Change the new heading text to Arial 16-point font. Apply a light olive green fill color to the new heading cell.
9. Select the range **A2:H2**. Apply the **italic** format, and increase the font size to **14 point**. Use AutoFit on all column widths.
10. Select the range **A1:H8**. Set the border line color to a dark olive green and the border line style to a single line. Then apply the **All Borders** format to the range A1:H8.
11. Change the page orientation to landscape.
12. Change the settings so the worksheet row numbers and column letters will be printed.
13. In Backstage view, preview how the worksheet will look when it is printed to make sure it will be printed correctly on the page. Close Backstage view, and make any necessary changes.
14. Save the changes, and close the workbook.

PROJECT 19–2

2-1.1.2
2-1.1.3
2-1.1.4
2-1.2.1
2-1.3.1
2-1.3.2
2-1.3.6
2-3.2.1
2-3.2.3

1. Open **Support** from the drive and folder where your Data Files folder is stored. Save the Support workbook as **Revised Support 1**, followed by your initials.
2. Click cell **A3**, and copy the cell contents to the Clipboard. Select the cell range **A4:A8**, and paste the values and number formatting of the copied cell. Then click cell **A9**, and copy and paste the cell value and formatting in the range A10:A11. Continue to copy the dates to complete the data in column A.
3. Change the format for the range A3:A47 to the 3/14 date format.
4. To make it easier to find information about the students, select the range **A2:H47**, and sort the data in the worksheet. Create a custom sort using the **My data has headers** option, and specify a sort by last name, from A to Z, and then by date, from oldest to newest.
5. Add a custom header to the worksheet that includes fields for the current date at left, the filename in the middle, and the number of pages at the right.
6. Select the cell range **A3:H47**. Apply the **Table Style Medium 11** table style from the Quick Table Styles gallery. Because you did not select the header row cells, there are no headers in the table.
7. Convert the table to a normal range. Use Format Painter to copy the format in cell A3 to the range A2:H2. Then hide row 3.
8. Scale the page layout so the worksheet fits on one page wide by one page tall. Confirm in Print Preview the worksheet data fits on one page in Print Preview.
9. Save the changes to the workbook. Then save the workbook as **Revised Support 2**, followed by your initials.
10. Change the page layout to landscape orientation. Change the scaling to **120%** of the normal size.
11. Insert a manual page break after row 25.
12. Format the worksheet so the column headings in row 2 are printed on the second page. In Backstage view, preview how the worksheet will look when printed.
13. Save the changes, and close the workbook.

PROJECT 19–3

1. Open **Tall Structures** from the drive and folder where your Data Files folder is stored. Save the Tall Structures workbook as **Revised Tall Structures**, followed by your initials.
2. Rename *Sheet1* in the workbook as **Towers**. Rename *Sheet2* in the workbook as **Buildings**.
3. In the *Towers* worksheet, sort the data based on the tower name from **A to Z**. Expand the selection to include all the columns.
4. Sort the data on the *Buildings* worksheet based on the number of stories from largest to smallest and then based on the year completed from largest to smallest.
5. Insert a new worksheet, and rename the worksheet **Structures**. Arrange the worksheets so they appear in this order: *Structures, Buildings, Towers*.
6. Copy all the data in the *Buildings* worksheet. Paste the copied data into cell A1 of the *Structures* worksheet, using the paste option to keep the source column widths.
7. In the *Towers* worksheet, copy all the data in the range **A3:E22**. Paste the copied data into cell **A17** in the *Structures* worksheet, keeping the source column widths.
8. In the *Structures* worksheet, sort the data based on the height in feet, from largest to smallest.
9. In the *Structures* worksheet, AutoFit the column C width, set the column D width to **7.00** and set the column E width to **12.00**. Format cells D1 and E1 so the text wraps in the cells.
10. In the *Structures* worksheet, freeze the top row. Hide column F. Then set the print area for the range A1:E36.
11. In the *Buildings* worksheet, change the page layout to landscape orientation. Apply conditional formatting to highlight the values for all buildings completed after the year 2000, using a color of your choice. Format the gridlines and headings to be printed.
12. In the *Towers* worksheet, filter the data in column C by showing all the text equal to **China**.
13. In the *Structures* worksheet, format the data as a table, using a table style of your choice.
14. Save the changes. Then save all three worksheets in the XPS format.
15. Close the XPS Viewer window, and then close the workbook.

IC3 2-1.1.2 2-1.1.3 2-1.1.4 2-1.2.1 2-1.3.1 2-1.3.2 2-3.1.2 2-3.1.4 2-3.2.1

PROJECT 19–4

1. Open the file **Expense Report** from the drive and folder where your Data Files folder is stored. Save the Expense Report workbook as **Updated Expense Report**, followed by your initials.
2. Merge and center the range A1:E1.
3. Apply an appropriate cell style to the headings in rows 1 and 2.
4. Format the range B3:D8 using the Accounting format for $ English (U.S.). Remove the decimal places. Then copy the format to cells E3:E8.
5. Enter the following data in column E:

   662.16
   530.02
   329.67
   172.41
   145.97
   11.88
6. In cell C10, type **5/1/16**. Change the date to the **14-Mar-12** format.
7. Select the range **A10:C10**, and format a double-line top border using a color that complements the colors in the cell styles applied in rows 1 and 2.
8. Save the changes, and close the workbook.

IC3 2-1.2.1 2-1.3.1 2-1.3.2 2-3.1.5 2-3.2.3 2-3.2.4

PROJECT 19–5

1. Open the file **Updated Expense Report** from the drive and folder where your Data Files folder is stored. Save the Expense Report workbook as **Revised Updated Expense Report**, followed by your initials.
2. Toggle on the track changes feature and identify the range A1:E10 to show the highlights on the screen.
3. Go to cell C3 and change the amount to **620**.
4. In cell C3 add the comment **I forgot to include taxes.**.
5. Go to C10 and change the date to **May 5** in the current year.
6. Review your tracked changes and comments in the ScreenTips to make sure they are correct.
7. Create a list of all the tracked changes in a new worksheet.
8. Save the changes, and close the workbook.

IC3 2-1.3.1 2-1.3.2 2-6.1.1 2-6.1.2 3.6.1.3

TEAMWORK PROJECT

Worksheets are excellent tools to organize information so you can make easy comparisons between sets of data. For this project, assume you need to set up a home office with new communications equipment. You have a tight budget, so you need several price options for each piece of equipment. With two or three teammates, gather and organize information as follows:

1. As a team, identify a list of six to eight pieces of equipment that a state-of-the-art home office needs. Some of these may be a desktop or laptop computer; an all-in-one printer that includes scanning, copying, printing, and faxing functions; a wireless phone; and so on.
2. Divide the list of equipment among the team members so each teammate is responsible for finding information on at least two items. Using computer catalogs or Web resources, find low-end, moderate, and high-end options for each item. For example, low-end options for a copier would include 10 pages per minute, black and white copies, and automatic document feeder. Moderate options for a copier would include 20 pages per minute, color printing, scanning, and faxing. High-end options would include 30+ pages per minute, sorting, collating, and stapling.
3. Designate a team member to create a worksheet, using the directions below, to organize the list of equipment the team members identify.

   A. Create a header row with the column headings **Item**, **Low End**, **Moderate**, and **High End** so you can enter descriptions and prices for each equipment item.

   B. Enter the research results in one worksheet. Format the worksheet so you can clearly see all data you have entered. Highlight cells, rows, or columns with color fill, fill color, or borders to indicate the items you think are most important.

   C. Enable the track changes feature.

   D. Save the workbook as **TP 19–1**, followed by the initials of the team member who created the workbook.
4. After the team member creates a draft of the workbook, share the workbook with each of the team members, via e-mail, a network, or the Cloud. Each team member should make edits they feel are necessary and provide feedback using comments.
5. Designate one of the team members to review the comments, accept or reject the edits, delete the comments, and make any other necessary changes.
6. As a team, compare your worksheet with other teams in the class to see what equipment items each team considered most important for a home office.

IC3 2-3.2.4 2-6.1.1 2-6.1.2 2-6.1.3 2-6.2.1 2-6.2.2 6-6.2.3

CRITICAL THINKING

CRITICAL THINKING 19–1

IC3 2-3.2.4

Worksheets are commonly used to organize and manage expenses. When the data is organized and labeled and formatted effectively, you can identify trends, draw conclusions, and compare and rank data.

1. Open the file **Expense Report** from the drive and folder where your Data Files folder is stored. Review the data in the worksheet.
2. Open a new Word document, and save the document as **CT 19–1**, followed by your initials.
3. Write a brief paragraph explaining how you can use the conditional formatting feature to help you draw conclusions about the values in the worksheet.
4. Save the changes to the Word document, and then close the document. Close the workbook file without saving any changes.

CRITICAL THINKING 19–2

Worksheet data can be very useful, but only if the data is comprehensive and accurate.

1. Open the file **Courses** from the drive and folder where your Data Files folder is stored. Review the data in the worksheet, which provides information about the current number of registrations for each term.
2. Open a new Word document, and save the document as **CT 19–2**, followed by your initials.
3. Write a brief paragraph explaining what additional information could be added to the worksheet to make the data more useful.
4. Save the changes to the Word document, and then close the document. Close the workbook without saving any changes.

ONLINE DISCOVERY

There are many Web sites that provide unit converters so you can convert measurements, weights, currency, temperatures, speed, and much more.

1. Search the Internet for *convert feet to meters* to find a site where you can convert feet to meters. Then complete the following steps:
2. If you completed Project 19–3, open your solution file **Revised Tall Structures**. If you did not complete Project 19–3, open the file **Tall Structures** from the drive and folder where your Data Files folder is stored. Save the workbook as **OD 19–1**, followed by your initials.
3. In the *Towers* worksheet (Sheet3), add a new column and label the new column with the heading **Height in Meters**. Adjust the column width as needed.

IC3 2-3.1.2 2-3.2.3

4. Use the online unit converter to convert the data in the *Height in Feet* column from feet to meters. Enter the conversion results in the new column. Format the cells to show three decimal places.
5. Cite the Web source by typing or copying and pasting the URL in a blank cell below the last row of data, and then in the cell below the URL, enter the current date.
6. Save the changes, and close the workbook.

JOB SKILLS

Your supervisor in the Education Department asks you to revise a worksheet that contains data for academic support sessions. The data is already entered in a worksheet, but it needs to be organized and formatted so the data is easier to read and access.

1. Open the file **Support** from the drive and folder where your Data Files folder is stored. Save the Support workbook as **JS 19–1**, followed by your initials.
2. Reorganize the data so that it's easier to read and access. Apply formats as desired.
3. Save the changes to the workbook.

IC3 2-3.2.4

EXPLORE AND SOLVE

Just as you add comments in Word documents, you can also add comments to worksheets. However, by default, comments that are added to worksheets are not printed. Explore how to print comments in a worksheet.

1. Create a new Word document, and save the document as **ES 19–1**, followed by your initials.
2. Describe how to print comments that are added to worksheets.
3. Save the changes to the document, and then close the document.

IC3 2-1.1.4 2-6.1.1



Estimated Time:
2 hours

LESSON 20

Creating Formulas and Charting Data

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Understand and create formulas in a worksheet.
- Understand and use relative and absolute cell references.
- Understand and use function formulas to calculate sums, the number of occurrences, averages, and the smallest and largest numbers in a range.
- Use formulas with cell references to connect a worksheet to other worksheets.
- Identify and correct formula errors.
- Create a chart from worksheet data, and interpret data from worksheets and charts.
- Edit chart data, and change chart formats and options.
- Use sparklines to create a visual representation of worksheet data.
- Use Quick Analysis for quick access data analysis.

DATA FILES

To complete this lesson, you will need these data files:

City Data.xlsx
Invoice.xlsx
Meal Orders.xlsx
Media Data.xlsx
Media Survey.docx
MPG Data.xlsx
Oakland Sales.xlsx
Q2 Mileage.xlsx
QC Results.xlsx
Regional Profits.xlsx
Regional Sales.xlsx
Utility Summary.xlsx
Weather Data.xlsx

WORDS TO KNOW

absolute cell reference
argument
chart
complex formulas
embedded chart
formula
function formula
mathematical function
mixed cell reference
operand
operator
order of evaluation
relative cell reference
sparkline
statistical function

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One of the primary uses of a spreadsheet is to manipulate numbers. Excel provides several tools that enable you to complete complex and repetitious calculations accurately, quickly, and easily. And, there are several more tools available to create graphics to represent the data.

Working with Formulas

VOCABULARY
formula
operand
operator
complex formulas
order of evaluation

Instead of using a calculator to perform mathematical calculations, you can use Excel tools to perform the tasks. The equation used to calculate values in a cell is known as a ***formula***. A formula uses numbers and cell references to perform calculations such as addition, subtraction, multiplication, and division. A formula consists of two components: an operand and an operator. The ***operand*** is a number or cell reference. The ***operator*** is a symbol that indicates the mathematical operation to perform with the operands. For example, in the formula =B5+6, the operands are B5 and 6; the operator is the plus sign. **Table 20–1** lists some of the mathematical operators used in Excel.

QUICK TIP

To create a minus sign in a formula, use the hyphen key in the number row on the keyboard or on the number keypad. You can find all the mathematical operator symbols except percent (%) on the number keypad.

TABLE 20–1 Operators used in Excel

OPERATOR	SYMBOL
Addition	+ (plus sign)
Subtraction	– (minus sign)
Multiplication	* (asterisk)
Division	/ (forward slash)
Percent	% (percent sign)

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All Excel formulas begin with the equal sign. This tells Excel that you are entering a formula instead of a numeric value. A formula can be as simple as a single cell reference. For example, if you enter the formula =B3 in cell C4, then cell C4 will show the same contents as cell B3. If you then change the value in cell B3, cell C4 is automatically updated to reflect the change.

QUICK TIP

When creating formulas, there must be a closing parenthesis for every opening parenthesis. Otherwise, an error message appears when you enter the formula.

Formulas containing more than one operator are called ***complex formulas***. For example, the formula =A4*B5+10 will perform both multiplication and addition. The sequence used to calculate the value of a formula is called the ***order of evaluation***. Multiplication and division are performed before addition or subtraction, and then calculations are performed from the left side of the formula to the right side. You can change the order of evaluation by using parentheses; calculations enclosed in parentheses are performed first. Be sure you position the parentheses correctly when you structure a formula. For example, =8/(4–2) equals 4, while =(8/4)–2 equals 0.

Table 20–2 provides examples to demonstrate the order of evaluation.

TABLE 20–2 Examples of order of evaluation

FORMULA	RESULT
=8+4*4	8 + 16 = 24
=8*4+4	32 + 4 = 36
=(8+4)*4	12 * 4 = 48
=8–4/4	8 – 1 = 7
=8/4-4	2 – 4 = –2
=(8*4)–(4/4)	32 – 1 = 31

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Computer users often make the mistake of assuming the formula will always deliver correct results. However, computers do not evaluate or assess the worksheet values. The information is simply processed, and the worksheet results are only as good as the data and formulas that are entered. If you input an incorrect formula, or if you input invalid data, the formula produces a false result—often referred to as "Garbage In, Garbage Out" (GIGO).

Creating and Editing a Formula

Generally, cell references are used in formulas rather than the actual value in a cell. If the value in the cell changes, the formula does not need to be updated. There are two ways to enter a cell reference into a formula: you can enter the cell reference, or you can click the cell. When entering the cell reference, the column letter can be entered in either uppercase or lowercase. In the Step-by-Steps in this text, the column letters you will enter are shown in lowercase, while those you click are shown in uppercase.

You can edit a formula the same way you edit text and data in cells.

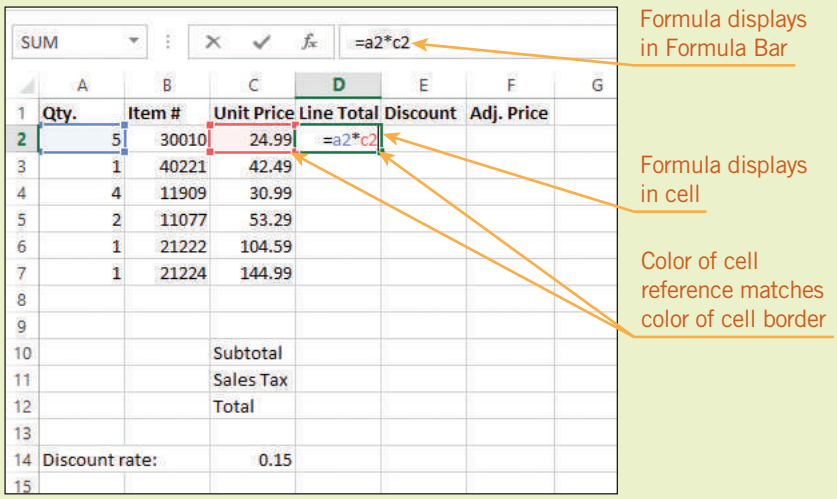
Step-by-Step 20.1

IC3
2-3.1.4
2-3.2.2

1. Start **Excel**, and open the file **Invoice** from the drive and folder where your Data Files folder is stored. Save the Invoice workbook as **Revised Invoice 1**, followed by your initials.
2. Click cell **D2**. Type **124.95**, which is the value of the quantity (5) times the unit price (24.99), and then press **Enter**.
3. Click cell **A2**, type **6**, and press **Enter**. Because the quantity changed, you need to update the line total. Click cell **D2**, type **149.94**, and press **Enter**.
4. The original quantity was correct. Click cell **A2**, type **5**, and then press **Enter**.

5. Instead of updating the line total manually, you can insert a formula that calculates the results and automatically adjusts to changes in the data. Click cell **D2**. Type **=a2*c2**. Compare your screen to **Figure 20–1**. Note that cell A2 has a blue border and cell C2 has a red border. The color of each of those cell borders matches the color of the cell reference in the formula. Also, note that the formula is displayed in both the cell and the Formula Bar.

FIGURE 20–1
Entering a formula in a cell



6. Press **Enter**. The result of the formula, *124.95*, is displayed in cell D2. Click cell **D2**. To display the formula in the Formula Bar, the cell must be active.
7. Click cell **D3**. Type **=**, and then click cell **A3**. The cell reference *A3* is now displayed following the equal sign in both cell D3 and the Formula Bar.
8. Type *, and then click cell **C3**. Both the cell and the Formula Bar now show the formula *=A3*C3*.
9. Press **Enter**. The result, *42.49*, is displayed in cell D3. Click cell **D3**. The formula is displayed in the Formula Bar.
10. Click cell **A3**, and type **10**. Then press **Enter** to change the quantity value. The result in cell D4 changes to *424.90* to reflect the increase in quantity.
11. Click cell **D4**. Type the formula **=a3*c3**, and then press **Enter**. The result *424.90* is displayed in cell D4. This is the same result that is displayed in cell D3 because even though the formula is in row 4, the cell references are for cells in row 3.
12. Click cell **D4**, and press **F2**. Change the 3s to 4s in the formula so the formula is *A4*C4*, and press **Enter**. (You can edit the formula either in the cell or in the Formula Bar.) The result *123.96* is displayed in cell D4.
13. Save the changes, and leave the workbook open for the next Step-by-Step.

Using Relative and Absolute Cell References

By default, when you create formulas, the cell references are formatted as ***relative cell references***, which means when the formula is copied to another cell, the cell references will be adjusted relative to the formula's new location. This automatic adjustment is helpful when you need to repeat the same formula for several columns or rows.

There are times, though, when you do not want the cell reference to change when the formula is moved or copied to a new cell. For example, you may be calculating a discount rate on a purchase order. To calculate the discount, the prices should always be multiplied by a fixed amount. To create this formula, you format an ***absolute cell reference*** that does not change when the formula is copied or moved to a new location. To create an absolute cell reference, you insert a dollar sign ($) before the column letter and/or the row number of the cell reference you want to stay the same. For example, =A1 is a formula with an absolute reference to cell A1.

A cell reference that contains both relative and absolute references is called a ***mixed cell reference***. For example, you can have an absolute column reference and a relative row reference. Or, you can have a relative column reference and an absolute row reference. To illustrate, =$A1 is a formula with a mixed cell reference. The column reference is absolute, and the row reference is relative. When formulas with mixed cell references are copied or moved, the row or column references that are preceded by a dollar sign will not change. However, the row or column references that are not preceded by a dollar sign will adjust relative to the cell to which they are moved.

VOCABULARY

relative cell reference

absolute cell reference

mixed cell reference

ABOVE AND BEYOND

You can toggle a cell reference from relative to absolute to mixed. Position the insertion point in or next to the desired cell reference in the Formula Bar. Each time you press F4, the cell reference will change. For example, the cell reference A1 toggles to A1, then to A$1, then to $A1, and then back to A1.

Step-by-Step 20.2

IC3
2-3.1.4
2-3.2.2

1. If necessary, open the file **Revised Invoice 1** from your solution files. Save the Revised Invoice 1 workbook as **Revised Invoice 2**, followed by your initials.
2. Click cell **D4**. Drag the **fill handle** down to cell **D7**. When you release the mouse button, results are displayed in each of the selected cells. Using the AutoFill feature, you copied the formula in cell D4 to cells D5, D6, and D7.
3. Click cell **D4**. The Formula Bar shows *=A4*C4*. *A4* and *C4* are relative cell references.
4. Click cell **D5**. The Formula Bar shows *=A5*C5*. When you filled the formula down, Excel automatically changed the cell references from A4 and C4 to A5 and C5. Click cells **D6** and **D7** to view the relative references in the formulas in each of those cells.
5. Click cell **E2**. Type **=d2*c14**. The cell reference C14 is an absolute cell reference. Note that cell C14 is formatted with a red border and displays the value *0.15* for the discount rate. Press **Enter**. The result *18.74* is displayed in the cell.

6. Click cell **E2**, and the drag the **fill handle** down to cell **E7** to fill down the formula. Then click cell **E3**. The Formula Bar shows *=D3*C14*. The relative cell reference changed from D2 to D3 to show the new row number, but the absolute cell reference to cell C14 did not change.
7. Click cell **C14**, and type **0.10** to change the value. As you press **Enter**, watch the values in column E change when the new discount rate is entered.
8. Click cell **F2**, type the formula **=d2–e2**, and then press **Enter**. Fill the formula down through cell **F7**.
9. Click the row **4 heading** to select the entire row, and then in the Cells group, click the top of the **Delete** button. Click cell **D6**. The formula has been updated, and the cell references that were for row 7 are now for row 6. Click cell **E6** and note that the absolute reference to cell C14 has been updated to cell C13.
10. Select row **6**, and then in the Cells group, click the top of the **Insert** button to insert a new row above row 6.
11. Click cell **D7**. The formula has been updated, and the cell references are now for row 7. Click the **Undo** button to remove the blank row.
12. Deselect the cells. Save the changes, and leave the workbook open for the next Step-by-Step.

QUICK TIP

When you insert or delete a new row or column that affects a range of cells identified in a formula, Excel will automatically update the range in the formula to reflect the change(s) in the range.

Using Function Formulas

VOCABULARY

function formula

mathematical function

statistical function

Obviously a worksheet can contain a great deal of data. The tools within Excel allow you to easily obtain commonly used information from data. For example, if you want to know the average of a set of values, you could use a function formula to perform the calculation. A ***function formula*** is a special formula that names a function instead of using operators to calculate a result. Excel has more than 400 built-in functions for performing calculations. ***Mathematical functions*** perform calculations that you could perform using a scientific calculator. ***Statistical functions*** are functions that describe large quantities of data. For example, a statistical function can determine the average of a range of data. Excel provides other types of functions, including trigonometric and logical functions, which are beyond the scope of this book. **Table 20–3** describes some of the most common mathematical and statistical functions available in Excel. There are several methods for entering functions in the worksheet. You can enter an equal sign, the function name, and the argument. Or, if you want help entering the formula, you can use the buttons on the Ribbon.

TABLE 20–3 Common Excel functions

MATHEMATICAL FUNCTIONS	DESCRIPTION
=PRODUCT	Multiplies values in the specified cells
=ROUND	Rounds the value to the nearest value in one of two ways: with the specified number of decimal places or to the nearest whole number
=ROUNDUP	Rounds the value up to the next higher-positive value (or the next negative value away from zero) with the number of specified decimal places
=ROUNDDOWN	Rounds the value down to the next lower-positive value (or to the next negative value toward zero) with the number of specified decimal places
=SUM	Adds the values in the specified range of cells
STATISTICAL FUNCTIONS	**DESCRIPTION**
=AVERAGE	Totals the range of cells, and then divides the total by the number of entries in the specified range
=COUNT	Counts the number of cells with values in the specified range
=MAX	Shows the maximum value within the specified range of cells
=MEDIAN	Shows the middle value within the specified range of cells
=MIN	Shows the minimum value within the specified range of cells

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Using the SUM Function

Although it is easy to enter a formula, if the formula consists of several cells, it could take you a long time to enter all the cell references. A shortcut for entering cell references is to name a range of cells. The AutoSum feature enables you to quickly identify a range and enter a formula. When you use the AutoSum feature, Excel scans the worksheet and identifies the most logical column or row of adjacent cells containing numbers to sum.

After identifying the range of cells, the AutoSum feature creates a function formula to calculate the sum of the range. In this case, the function is SUM. The SUM function formula is the most frequently used type of function formula. There are three components of a function formula: the equal sign, the function name, and the arguments. The equal sign tells Excel that a formula follows. The function name tells Excel what to do with the data. The ***argument*** is a value, a cell reference, a range, or text that acts as an operand in a function formula, and it is enclosed in parentheses after the function name. You will learn about other function formulas in the next section of this lesson. **Figure 20–2** illustrates an example of a formula containing the SUM function. The equal sign indicates that a formula follows. The function name SUM designates that the values of the five cells included in the argument (B4:B8) will be added.

VOCABULARY
argument

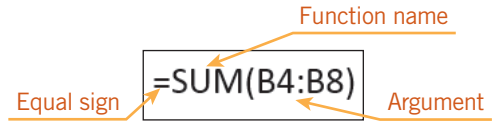


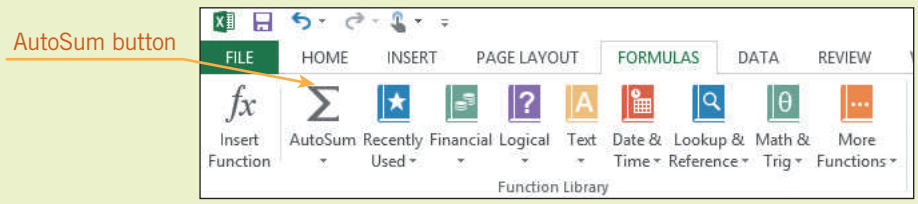
FIGURE 20–2 Parts of a function formula

Step-by-Step 20.3

IC3
2-1.1.2
2-3.2.2
2-3.2.3

1. If necessary, open the file **Revised Invoice 2** from your solution files. Save the Revised Invoice 2 workbook as **Revised Invoice 3**, followed by your initials.
2. Click cell **F9**. Click the **FORMULAS** tab. In the Function Library group, click the top part of the **AutoSum** button Σ shown in **Figure 20–3**.

FIGURE 20–3
Function Library group on the FORMULAS tab



3. As shown in **Figure 20–4**, a marquee is displayed around the cell range F2:F8, and in cell F9 the formula *=SUM(F2:F8)* is proposed. A ScreenTip also appears showing that the formula involves adding numbers. Press **Enter** to accept the formula.

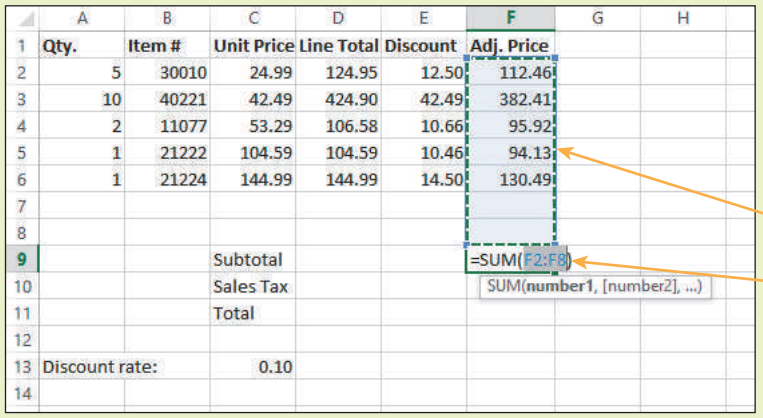


FIGURE 20–4
A proposed SUM function formula

4. The result *815.41* is displayed in cell F9. Click cell **F9** to show the formula in the Formula Bar. Note that the formula is the same as the proposed formula. The cell references in parentheses are relative cell references.
5. Click cell **F10**, type **=f9*(.07)**, and press **Enter**. The result *57.08* is displayed in cell F10.
6. The active cell is F11. Click the top of the **AutoSum** button to add the subtotal and the sales tax. Note the marquee only surrounds cell F10.
7. Point to the *sizing handle* on either the upper-left or upper-right corner of the marquee, and drag the **top border** of the marquee up to include cell F9 in the selection. When the marquee on your screen matches the marquee shown in **Figure 20–5**, press **Enter**. The result *872.49* is displayed in cell F11.

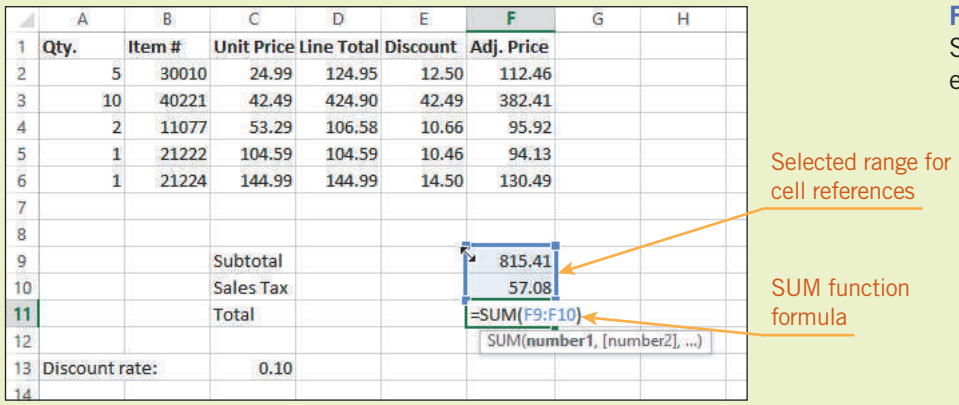


FIGURE 20–5
SUM function formula with extended marquee

8. Click cell **F10**. In the Formula Bar, position the insertion point after the number *7* in the formula, and type **5**. The Formula Bar should now show *=F9*(0.075)*. Press **Enter**. The result in cell F10 changes to *61.16*, and the result in cell F11 changes to *876.56*.
9. Cell F11 is the active cell. Click the **HOME** tab, and open the **Clipboard** pane. If necessary, clear the contents of the Clipboard.

10. In the Clipboard group, click the **Copy** button. Click cell **A17**, and then in the Clipboard group, click the top of the **Paste** button. The result *0.00* is displayed in cell A17, and the formula *=SUM(A15:A16)* is displayed in the Formula Bar. This is because you pasted the formula and not the cell value, and the cells referenced in the formula are empty.
11. Click cell **A18**. Click the **Paste** button arrow, and then under *Paste Values*, click the **Values** button. The result *876.5647* is displayed in cell A18.
12. With cell A18 still active, in the Number group on the HOME tab, click the **Decrease Decimal** button two times so the result that is displayed is *876.56*.
13. Close the Clipboard pane. Save the changes, and then close the workbook.

Using the COUNT Function

The COUNT function is a statistical function that determines the number of cells in the argument range that contain numerical values. It is important to distinguish the difference between the COUNT function and the SUM function. The COUNT function tallies the number of occurrences of numerical data, and the SUM function totals all the numerical data.

Like the SUM function, and several other commonly used functions, you can enter the COUNT function by clicking a button on the Ribbon. Another alternative is to open the Function Arguments dialog box, which is very useful when you use functions that are not as common. The Function Arguments dialog box is useful in the process of building a formula that contains a function. The intent of the Function Arguments dialog box is to guide you in creating formulas, but sometimes the dialog box can get in the way when you are creating the formula. The collapse and expand features in the Function Arguments dialog box allow you to minimize and maximize the dialog box as you work with it. Step-by-Step 20.4 will show you how to access this dialog box and the hundreds of built-in functions that Excel offers.

Step-by-Step 20.4

IC3
2-1.1.8
2-3.2.2

1. Open the file **Meal Orders** from the drive and folder where your Data Files folder is stored. Save the Meal Orders workbook as **Revised Meal Orders**, followed by your initials.
2. Click cell **B39**, and then click the **FORMULAS** tab.
3. To calculate the number of Chicken orders, click the **AutoSum** button arrow and then click **Count Numbers**. The marquee indicates the B36:B38 range.
4. Click cell **B38**, and then drag up to cell **B5** to select the range **B5:B38**. Press **Enter**, and the result *10* is displayed in cell B39.

5. Click cell **C39**. In the Function Library group, click the **More Functions** button. Point to *Statistical*, and a complete list of statistical functions is displayed in a submenu. In the submenu, click **COUNT**. The Function Arguments dialog box shown in **Figure 20–6** opens. A brief explanation of the COUNT function is provided in the dialog box. A proposed range *B39* is displayed in the *Value1* text box, which is obviously not correct.

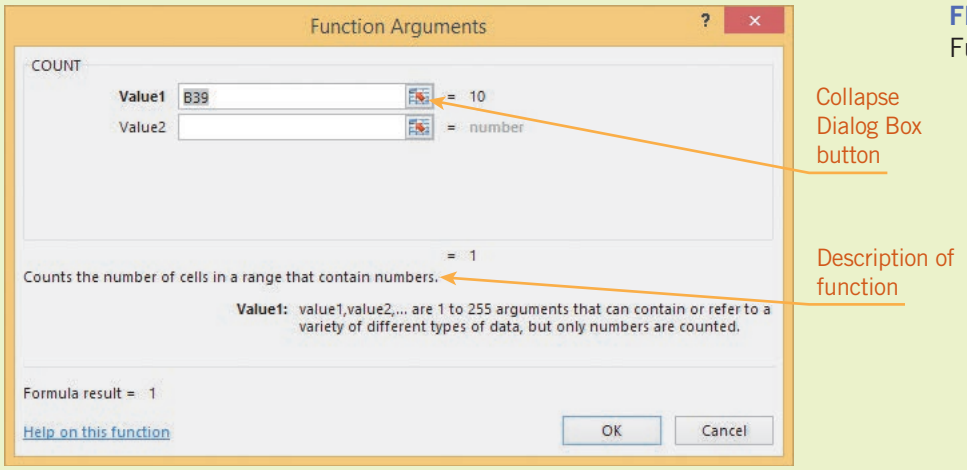


FIGURE 20–6
Function Arguments dialog box

6. If you do not have an Internet connection, go to Step 7. If you do have an Internet connection, in the lower-left corner of the dialog box, click the **Help on this function** link. The Help window opens and provides a worksheet with examples to further explain how the function works. Scroll through the information to learn more about the COUNT function, and then close the Help window.
7. Click the **Collapse Dialog Box** button at the right side of the *Value1* text box. The dialog box minimizes so you can see the worksheet cells, but you can also still see the dialog box title bar and the range of cells for Value1. The proposed formula is also displayed in the Formula Bar. (If necessary, drag the dialog box title bar to reposition the dialog box on the screen so you can see the Formula Bar.)
8. Scroll to the top of the worksheet, and then select the range **C5:C38**. The formula in the dialog box is updated and now shows the new range you selected. The formula in the Formula Bar is also updated and shows *=COUNT(C5:C38)*.
9. Click the **Expand Dialog Box** button next to the *Value1* text box (or press **Enter**). The dialog box is maximized. Click **OK**. The dialog box closes, and the result *18* is displayed in cell C39.
10. With cell C39 still active, drag the **fill handle** into column **D** to fill the function formula across the column. The result *4* is displayed in cell D39. Click cell **D39**. The formula in the Formula Bar shows =COUNT(D5:D38).
11. Save the changes, and then close the workbook.

Using the AVERAGE, MIN, and MAX Functions

The AVERAGE function is also a statistical function. It calculates the average of the range identified in the argument. For example, the function =AVERAGE(B2,G2) calculates the average of the values contained in cells B2 and G2. Note that in this example, the cell references are separated by a comma instead of a colon. That is because these cells are not adjacent, and only two cells are identified in the range. The comma is used to distinguish the two cell references.

The MIN (minimum) and MAX (maximum) functions are two more statistical functions. The MIN function shows the smallest number contained in the range identified in the argument. The MAX function shows the largest number contained in the range identified in the argument.

Step-by-Step 20.5

IC3
2-1.1.2
2-3.2.2

1. Open the file **Weather Data** from the drive and folder where your Data Files folder is stored. Save the Weather Data workbook as **Revised Weather Data**, followed by your initials.
2. Click cell **B11**, and if necessary click the **FORMULAS** tab.
3. To calculate the average low temperature for the week, click the **AutoSum** button arrow, and then click **Average**. The formula *=AVERAGE(B10)* is proposed. Click the **Formula Bar**, and edit the formula so the argument shows the range **B2:B8**. The revised formula should be displayed as *=AVERAGE(B2:B8)*.
4. Press **Enter** (or click the Enter button on the Formula Bar). The result *9* is displayed in cell B11.
5. To calculate the average high temperature for the week, click cell **B11**. Drag the **fill handle** to the right to select cell **C11**. The formula is copied to cell C11, and the result *24* is displayed.
6. Click cell **B12**. Click the **AutoSum** button arrow, and then click **Min**. Select the range **B2:B8**, and press **Enter**. The result *-2* is displayed in cell B12.
7. Click cell **C12**. Click the **AutoSum** button arrow, and then click **Max**. Select the range **C2:C8**, and press **Enter**. The result *31* appears in cell C12.
8. You realize you entered the formula in the wrong cell. Click cell **C12**, and then click the **HOME** tab. In the Clipboard group, click the **Cut** button. Click cell **C13**, and then click the top of the **Paste** button. The formula is moved to cell C13.

9. Click cell **D14**. In the Editing group on the HOME tab, click the **AutoSum** button arrow  , and click **Max**. Press **Enter** to accept the proposed range D2:D13. The result *4.9* is displayed in cell D14.
10. Select the range **B2:B8**. A preview of the Average, Count, and Sum results for the selected range is displayed in the status bar at the bottom of the screen.
11. Click cell **B16**. Click the **AutoSum** button arrow, and then click **Count Numbers**. Select the range **B2:B8**, and press **Enter**. The result *7* is displayed in cell B16.
12. Save the changes, and then close the workbook.

Creating Formulas that Reference Cells in Multiple Worksheets

As you already know, Excel features enable you to work with multiple worksheets (pages) in three dimensions (3D). The 3D reference enables you to access data from three different dimensions in the workbook: length, width, and depth. Length and width refer to the worksheet rows and columns. Depth refers to the ability to connect the worksheets by creating formulas that reference the same cell or range in multiple worksheets. These 3D references are often used in summary worksheets to condense and total data from other worksheets.

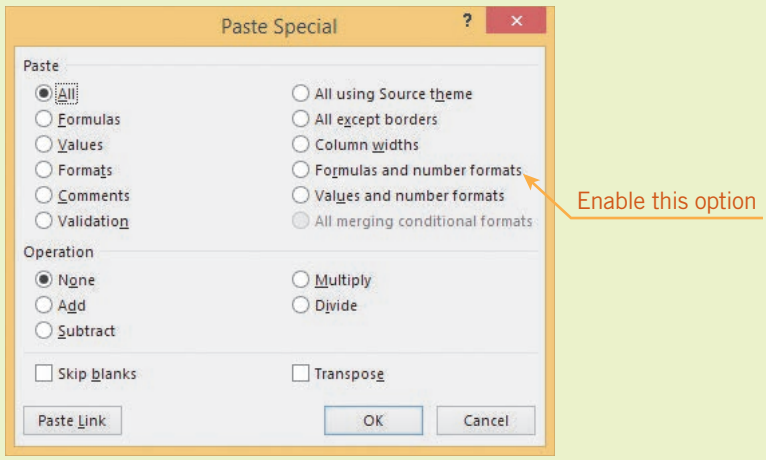
Step-by-Step 20.6

IC3
2-1.1.2
2-3.1.4
2-3.2.3

1. Open the file **Regional Sales** from the drive and folder where your Data Files folder is stored. Save the Regional Sales workbook as **Revised Regional Sales**, followed by your initials.
2. Click each worksheet tab to view all five worksheets. You will see that the Western worksheet is not complete. The cell contents for the numbers have not been formatted, and the values in the *Difference* column have not been calculated. Also, the Summary worksheet needs to be updated with the Western region data.
3. Click the **Central** worksheet tab, and then click anywhere in the cell range **B3:D14**, where the content is formatted for currency. With a formatted cell selected, double-click the **Format Painter** button in the Clipboard group.

4. Click the **Western** worksheet tab to switch to that worksheet. Drag the mouse pointer to select the cell range **B3:C14** to apply the copied number format. Deselect the cells.
5. Click the **Central** worksheet tab, and press **Esc** to toggle off the Format Painter.
6. Click cell **D3**. In the Clipboard group on the HOME tab, click the **Copy** button. Click the **Western** worksheet tab, and select the cell range **D3:D14**. Click the **Paste** button arrow, and at the bottom of the menu click **Paste Special** to open the Paste Special dialog box shown in **Figure 20–7**.

FIGURE 20–7
Paste Special dialog box



7. Under *Paste*, enable the option **Formulas and number formats**, and click **OK**. The formula is pasted, and the number formatting is applied to the results.
8. Click cell **B16**. In the Editing group, click the **AutoSum** button. The range B3:B15 should be selected. Press **Enter** to calculate the total goal for the year. Then click cell **B16**, and drag the **fill handle** across cells **C16** and **D16** to copy the formula. With the range B16:D16 still selected, in the Number group click the **Accounting Number Format** button $ and then click the **Decrease Decimal** button twice to remove the decimal places.
9. Click the **Summary** worksheet tab. Click cell **B5**. The Formula Bar shows the formula *=Southern!B16*. The cell reference Southern!B16 refers to cell B16 on the *Southern* worksheet.

10. Click cell **B6**. Type **=**. Click the **Western** worksheet tab, and then click cell **B16**. A marquee surrounds the active cell. Press **Enter**. The value *$654,000* is displayed in cell B6 in the *Summary* worksheet.
11. Click cell **C6**. Type **=western!c6**. Press **Enter**. The value *$53,879* is displayed in cell C6. You realize you made an error in the formula. Click cell **C6**. In the Formula Bar, position the insertion point between *C* and *6*, and type **1** so the modified formula is displayed as *=Western!C16*. Press **Enter**. The calculation is updated, and the value *$657,242* is displayed in cell C6.
12. Click cell **D6**. Type **=western!d16**. Press **Enter**. The value *$3,242* is displayed in cell D6.
13. Note that the value in cell C5 is *$623,692* and the value in cell D5 is *$10,692*. Click the **Southern** worksheet tab, and then click cell **C8**. Type **52199**, and press **Enter**. The cell value is replaced, and cells C16 and D16 are updated. Click the **Summary** worksheet tab. The values in cells C5 and D5 have automatically been updated to reflect the edits made on the Southern worksheet. Cell C5 now displays *$623,982*, and cell D5 displays *$10,982*.
14. Save the changes, and then close the workbook.

Troubleshooting Common Formula Errors

When Excel cannot properly perform a calculation, an error value appears in the cell where you entered the formula. The error may exist because the cell contains text instead of a numeric value. An error value appears if the cell referenced in the formula contains an error or if a formula tries to divide by zero. An error value also appears if the cell is not wide enough to show the result. There are a number of common errors that occur—and common causes for those errors. **Table 20–4** lists these common errors, their typical causes, and some possible solutions. Fortunately, Excel provides help to solve formula errors.

QUICK TIP

Excel has an AutoCorrect feature that automatically checks a formula for common keyboarding mistakes. Sometimes Excel is able to identify the error. If so, a suggested correction appears in an alert box.

TABLE 20–4 Common errors, their causes, and solutions

ERROR	TYPICAL CAUSE/SOLUTION
#####	**Cause:** Occurs when the column is not wide enough or if a negative date is entered **Solution:** If the column is not wide enough, AutoFit the column or change the number format so the number will fit within the column; negative dates usually occur when there is an incorrect formula calculating a date, so check and correct your date formula
#VALUE!	**Cause:** Occurs when the wrong type of argument or operand is used, which could result from a formula referencing cells with text when the formula requires a number **Solution:** Trace the error to determine the cause and correct it **Cause:** Occurs when a cell reference in the formula refers back to its own cell, either directly or indirectly, creating a circular reference **Solution:** Remove the circular reference or enable repeated recalculations
#DIV/0!	**Cause:** Occurs when a number is divided by zero, which is most often caused by using a cell reference to a blank cell or to a cell that contains a zero **Solution:** Trace the error and correct the reference
#N/A	**Cause:** Occurs when a value is not available to a function or formula, often caused by missing data or by referencing a cell that contains #N/A instead of data (which you can use as a placeholder for data that is not yet available) **Solution:** Trace the error and replace the missing data with a real value **Cause:** Can be caused by giving an inappropriate value for a lookup **Solution:** To resolve, make sure the lookup value argument is the correct type of value—for example, a value or a cell reference, but not a range reference
#REF!	**Cause:** Occurs when a cell reference is not valid, often caused by deleting cells referred to by other formulas or pasting moved cells over cells referred to by other formulas **Solution:** To correct this error, trace the error and then change the formulas; if you notice the error right after deleting or pasting cells, restore the cells on the worksheet by clicking Undo immediately after you delete or paste the cells which caused the error **Cause:** This can also be caused by a link to an application that is not running **Solution:** To resolve the error in this case, start the application the worksheet is trying to link to
#NUM!	**Cause:** Occurs with invalid numeric values in a formula or function, often caused by using an unacceptable argument in a function that requires a numeric argument **Solution:** To correct this, make sure the arguments used in the function are numbers—for example, even if the value you want to enter is $1,000, enter 1000 in the formula **Cause:** This error can also be caused by using a worksheet function that iterates, such as IRR or RATE, and the function cannot find a result **Solution:** To resolve the error in this case, use a different starting value for the worksheet function or change the number of times Excel iterates formulas
#NULL!	**Cause:** Occurs when using a space where it is not appropriate **Solution:** Check for inappropriate spaces in the formula; for example, when referencing two ranges, make sure a comma separates the ranges: =SUM(C1:C5,D4:D5)

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Step-by-Step 20.7

2-3.1.4
2-3.2.2
2-3.2.3

1. Open the file **QC Results** from the drive and folder where your Data Files folder is stored. Save the QC Results workbook as **Revised QC Results**, followed by your initials.
2. Click cell **E4**. Type **=d4/c4**, and press **Enter**. The characters *####* are displayed in cell E4 as shown in **Figure 20–8**.

	A	B	C	D	E	F
1	QUALITY CONTROL RESULTS					
2	Item	Processed	Tested	Flawed		Est. Flawless
3				#	%	
4	8 oz. jars		2,000	26	####	
5	12 oz. jars		4,500	55		
6	24 oz. jars		3,100	36		
7	32 oz. jars		2,500	16		
8	64 oz. jars		2,750	12		
9						

FIGURE 20–8
Error notification of insufficient space

3. Double-click the **right border** of the column E label to use the AutoFit feature on the width of column E. Cell E4 now displays *1.30%*. Click cell **E4**, and drag the **fill handle** down to **E8**.
4. Click cell **F4**. Type **=a4/c4**, and press **Enter**. As shown in **Figure 20–9**, *#VALUE!* is displayed in the cell and there is a small green triangle in the upper-left corner of the cell.

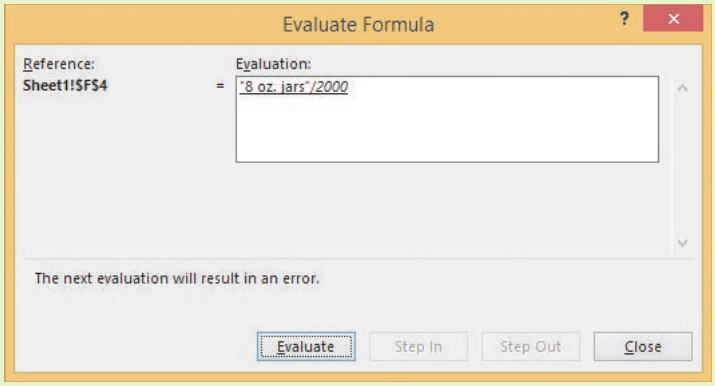
	A	B	C	D	E	F
1	QUALITY CONTROL RESULTS					
2	Item	Processed	Tested	Flawed		Est. Flawless
3				#	%	
4	8 oz. jars		2,000	26	1.30%	#VALUE!
5	12 oz. jars		4,500	55	1.22%	
6	24 oz. jars		3,100	36	1.16%	
7	32 oz. jars		2,500	16	0.64%	
8	64 oz. jars		2,750	12	0.44%	

FIGURE 20–9
A formula error notification

5. Click cell **F4**. The Error Checking button, an exclamation point within a diamond shape, is displayed to the left of the active cell. The Error Checking button is displayed when a cell may contain a formula error. Point to the *Error Checking* button to display a ScreenTip that describes the error.

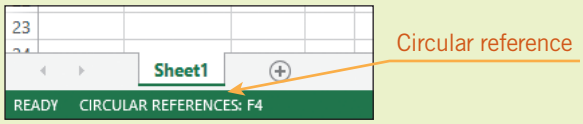
6. Click the **Error Checking** button. In the menu, click **Show Calculation Steps**. The Evaluate Formula dialog box shown in **Figure 20–10** opens. Under *Evaluation*, the formula is displayed with the cell values. Now you can clearly see the problem: you are trying to divide text *(8 oz. jars)* by numbers.

FIGURE 20–10
Evaluate Formula dialog box



7. Close the dialog box. In the Formula Bar, change A4 to **F4** so the revised formula is *=F4/C4*.
8. Press **Enter**. An Excel dialog box opens with a Circular Reference Warning and explains that a cell reference in the formula (in this case F4) refers to the cell's own value. Click **OK**. The value *0* is displayed in cell F4. As shown in **Figure 20–11**, in the lower-left corner of the screen, the status bar indicates that the circular reference is the cell reference F4.

FIGURE 20–11
Circular reference on the status bar



9. Click cell **F4**. Type **=(100%–e4)*b4**, and press **Enter**. The value *0* is displayed in cell F4 because cell B4 has no value. Click cell **F4**, and then fill down the formula to cell **F8**.
10. Click cell **B4**. Type **200000**, and press **Enter**. The value *197,400* is now displayed in cell F4.
11. Click cell **B4**. In the Number group on the HOME tab, click the **Comma Style** button, and then click the **Decrease Decimal** button twice. Click the cell **B4 fill handle**, and fill down to cell B8. The value *200,000* is now displayed in all the selected cells. In the lower-right corner of cell B8, click the **AutoFill Options** button. The menu shown in **Figure 20–12** is displayed.

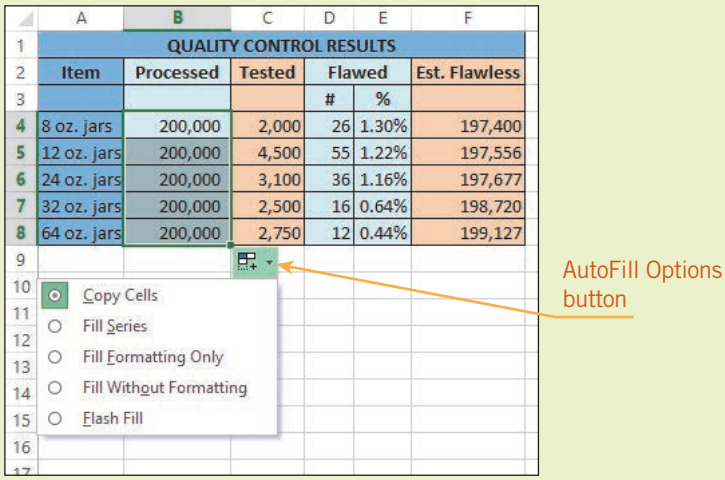


FIGURE 20–12
AutoFill Options menu

12. Select the option **Fill Formatting Only**. The values are removed from the range B5:B8, but the cell format remains in the range of cells.
13. Enter the following values in cells B5:B8. As you enter the values, the calculations are performed, the cell format is applied, and the values in column F are updated.

    450000

    310000

    350000

    275000
14. Save the changes, and then close the workbook.

Using Graphics to Represent Data

Obviously a worksheet can contain a great deal of information. The results of a worksheet are only accurate if correct data and formulas have been entered. If you are certain of the accuracy of the content of the worksheet, then the next questions are: What does the data in this worksheet tell me? What logical conclusions can I draw from it?

As you analyze worksheet data, you may notice in a column that the values are continually increasing. If this column is a chronological listing of your company's sales, you could conclude that there is a trend—that your company's sales are increasing each year. On the other hand, if this same column is not a chronological listing of sales, but rather a listing of sales by region, it is not logical to interpret a trend, but you can compare the data for each region.

To draw conclusions from the worksheet data, you can translate the data to a ***chart***, which is a graphic representation of your worksheet data. Charts are an excellent means of conveying information, and they are extremely useful for summarizing, clarifying, or highlighting data. In a business, management at all levels must understand the data generated on a daily basis, but upper-level management relies on charts to look for trends and oddities.

ABOVE AND BEYOND

Excel offers several other options for adding graphic representations to a worksheet. On the INSERT tab, click a button in the Illustrations group to insert pictures, online pictures, shapes, SmartArt, and screenshots.

VOCABULARY

chart

When the values and their representation are correct, a chart can help you gain an understanding that would perhaps not be clear when looking at the worksheet data. However, if a chart is not set up correctly, the representation can be confusing or misleading. The first step in creating a chart is to decide what type of chart you want to create. Excel provides several options for chart types. The chart type you select will depend on the data you want to represent. **Table 20–5** lists some of the Excel chart types and a description of the types of data you can illustrate with each chart.

TABLE 20–5 Chart types

CHART TYPE	DESCRIPTION
Column chart	Useful in showing changes over a period of time, or for making comparisons among individual items
Line chart	Illustrates trends in data at equal intervals
Pie chart	Compares the sizes of portions as they relate to a whole unit, and illustrates that the parts total 100 percent; effective for one data series, such as one column or row of data with one column or row of column and row headings
Bar chart	Helpful when you want to make comparisons among individual items
Area chart	Effective for emphasizing trends because it illustrates the magnitude of change over time
Scatter chart	Illustrates scientific data, and it specifically shows uneven intervals—or clusters—of data
Other charts	Stock, Surface, Doughnut, Bubble, and Radar

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Excel 2013 provides a new feature to help you choose a chart type. For the best outcome, use, the Recommended Charts command in the Charts group on the INSERT tab. Excel will suggest a list of different chart types generated by an algorithm based on your selected data. Live previews with your selected data will make it easier for you to choose a chart type.

An attractive chart will grab attention and Excel provides many predesigned chart layouts and styles that make it easy for you to create professional-looking charts. But to convey meaning, the values represented in the charts must be correctly labeled. After you decide which chart type to create, the next step is to decide which chart options you want to use. To do this, you must first understand the elements in a chart. **Figure 20–13** identifies the chart elements. Take time to review and become familiar with the various parts. Customizing the table elements helps identify and clarify the chart contents.

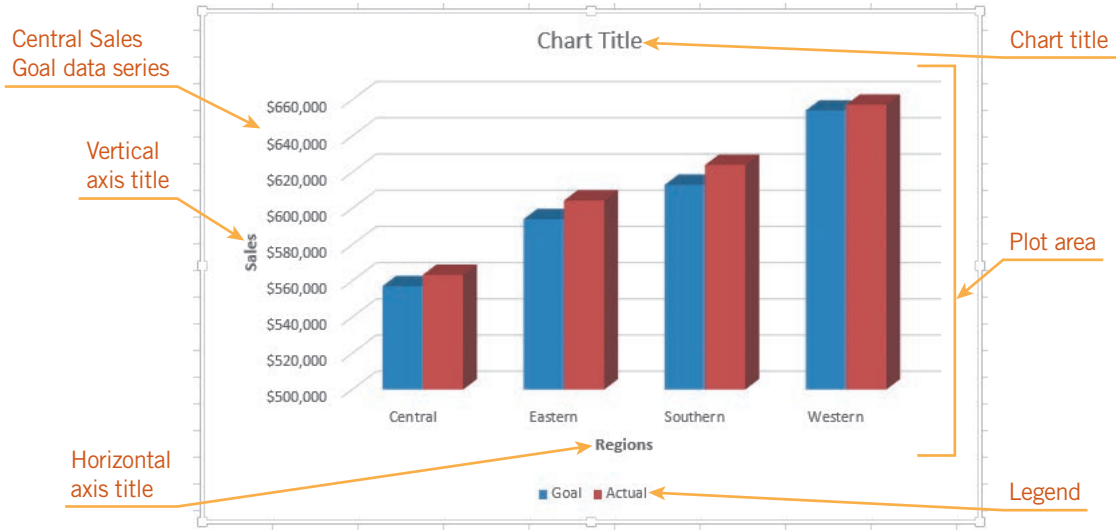


FIGURE 20–13 Chart elements

Creating a Chart

When creating a chart, you define specific data to be included in the analysis. As a result, you frequently need to select nonadjacent cells. To select nonadjacent cells, click the first cell, press and hold Ctrl, and then click the next cell. Once the data is identified, you choose a chart type and the chart is inserted in the worksheet.

When the chart is selected, the Chart Elements button displays outside the upper-right corner of the canvas. The Chart Elements button provides a menu for selecting the elements that can add more value to the chart such as titles, data labels, and legends.

There may be occasions when the data used to create the chart changes after the chart has been created. Fortunately, you do not need to create a new chart. When you edit the data in the worksheet, the chart is automatically updated to reflect the changes. And, if you decide the chart type is not effective, you can choose a new chart type without starting over.

Step-by-Step 20.8

IC3
2-1.1.9
2-1.4.2
2-3.2.5

1. Open the file **Media Data** from the drive and folder where your Data Files folder is stored. Save the Media Data workbook as **Revised Media Data 1**, followed by your initials.
2. Select the range **A5:A9**, and then press and hold **Ctrl** as you select the range **C5:C9**. Two ranges of data are selected. Click the **INSERT** tab. In the Charts group shown in **Figure 20–14**, click the **Recommended Charts** button.

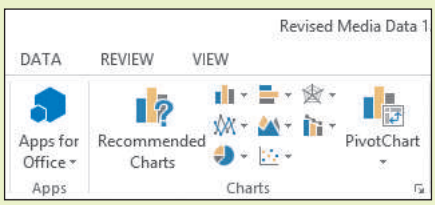


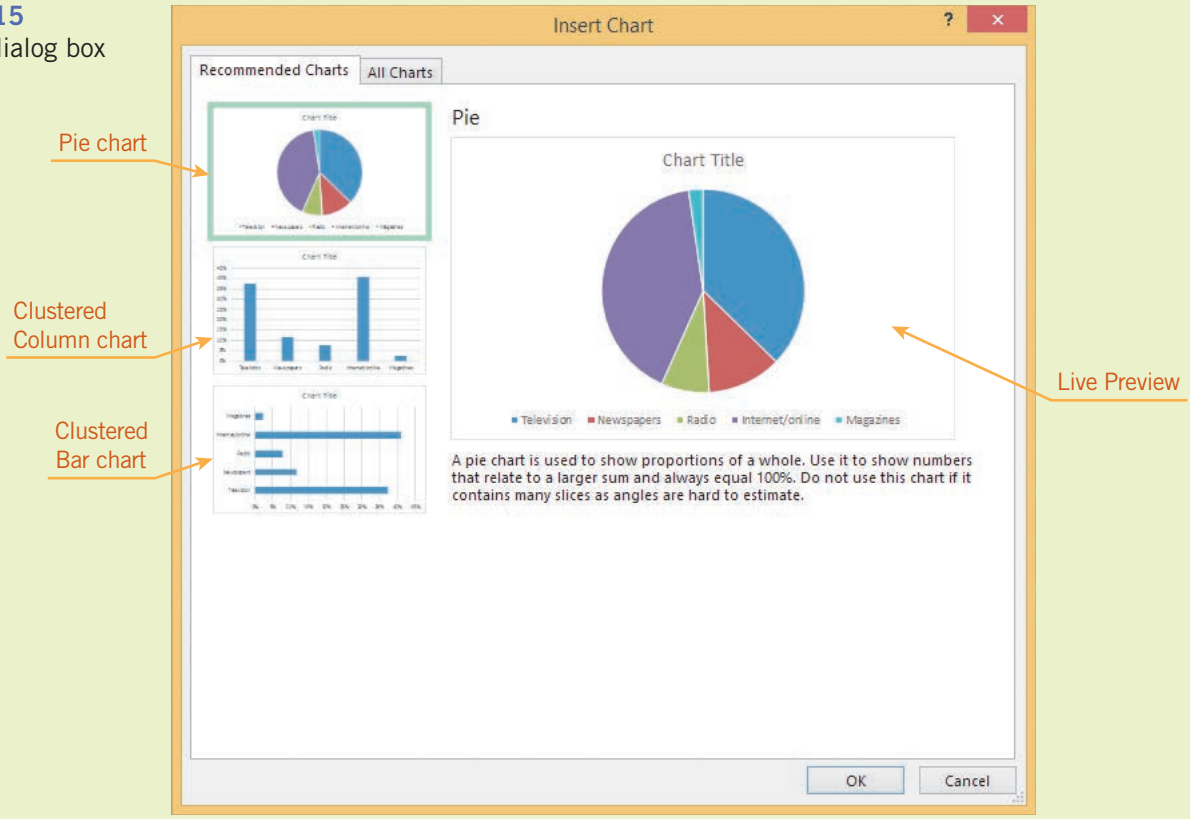
FIGURE 20–14
Charts group on the INSERT tab

QUICK TIP

If you are confident to choose a chart type without looking at the recommendations for chart types, you can click any of the chart type buttons in the Charts group.

3. The Insert Chart dialog box shown in **Figure 20–15** opens. In the left pane, the first recommended chart is the Pie chart. A live preview of the selected data converted to a pie chart displays in the right pane. Below the live preview is a description of when and how to use a pie chart to illustrate data.

FIGURE 20–15
Insert Chart dialog box



ABOVE AND BEYOND

You can create an instant chart by selecting the data you want to chart and then pressing F11. A two-dimensional column chart is created.

4. In the left pane, click the second recommended chart, a **Clustered Column** chart. Then click **OK**. The chart is inserted in a canvas on the active worksheet, as shown in **Figure 20–16**. Also, the Ribbon adapts to show the CHART TOOLS DESIGN tab.

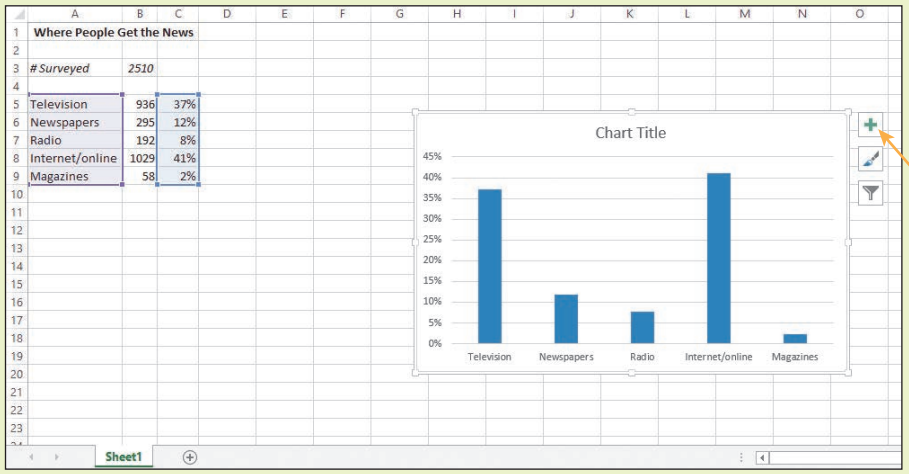


FIGURE 20–16
Chart inserted in worksheet

5. Outside the upper-right corner of the chart canvas, click the **Chart Elements** button. In the CHART ELEMENTS menu, point to *Chart Title* and then click the **Chart Title right arrow** to show the submenu shown in **Figure 20–17**. Then click **Centered Overlay**. The text box, which is a placeholder for the chart title, is selected.

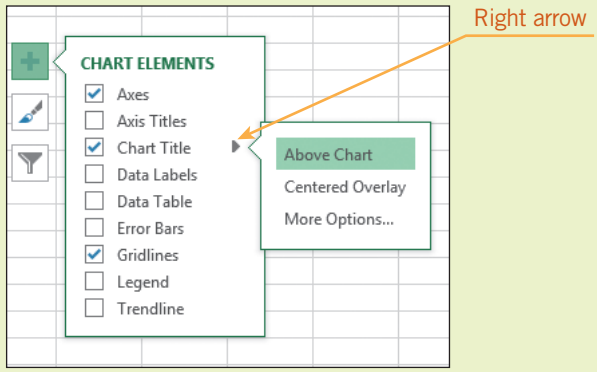
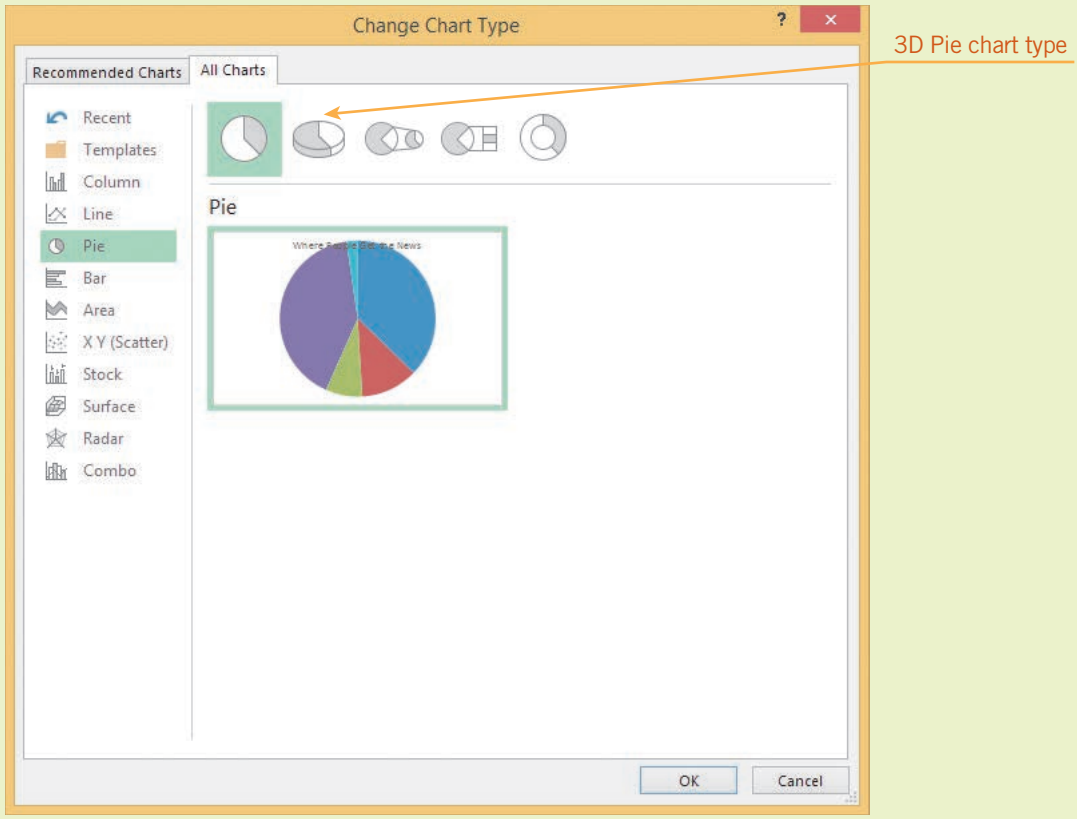


FIGURE 20–17
CHART ELEMENTS menu and submenu

6. Click inside the text box, and then select all of the text in the text box. Type **Where People Get the News**. Click a blank area on the canvas to deselect the text box.
7. Click the **Chart Elements** button and then click **Axis Titles** to enable the option. Point to *Axis Titles* and then click the **Axis Titles right arrow**. Both the Primary Horizontal and the Primary Vertical options should be enabled. Click a blank area on the worksheet to close the menus.
8. Two new text boxes (*Axis Title*) are positioned on the left side of the chart and at the bottom of the chart. Select the text in the text box on the left and type **Percentage**. Select the text in the text box at the bottom and type **Media**. Click a blank area on the canvas to deselect the text box.

9. You decide a pie chart will communicate the data more effectively. In the Type group on the CHART TOOLS DESIGN tab, click the **Change Chart Type** button. The Change Chart Type dialog box opens. In the left pane, click **Pie** to show the options shown in **Figure 20–18**. The chart options available are based on the selected worksheet data.

FIGURE 20–18
Change Chart Type dialog box



10. In the bar at the top of the right pane, click the second option **3-D Pie**, and then click **OK**.
11. Click the **Chart Elements** button. Point to *Legend* and then click the **Legend right arrow**. Use Live Preview to preview the options. Then click **Left** to move the legend to the left side of the canvas.
12. The CHART ELEMENTS menu is still open. Click **Data Labels** to enable the option. Click the **Data Labels right arrow** and then click **Outside End**. The placement of the labels on the chart changes.
13. You learn that your data for Television and Internet/online are reversed. Click cell **B5**, and type **1029**. Click cell **B8**, type **936**, and press **Enter**. As you enter the new data, the values in cells C5 and C8 are updated and the chart is also updated.
14. Save the changes, and leave the workbook open for the next Step-by-Step.

Changing Chart Formats

Many of the parts of the chart such as the chart title and the axis titles are positioned on the chart in a text box. When you click the part of the chart you want to change, the object boundaries will appear, and then you can change the formats.

You can choose whether to keep the chart in the same worksheet as the data on which the chart is based, or you can move the chart to a different worksheet. An ***embedded chart*** is a chart created on the same worksheet as the data used in the chart. One advantage of embedding a chart on the same page as the data is that the data and the chart can be viewed at the same time. If the chart will not fit on the same worksheet with the data, or if you want to create more than one chart from the same data, you will probably want to move the chart to a separate worksheet.

VOCABULARY
embedded chart

Step-by-Step 20.9

IC3
2.1.1.2
2-1.2.1
2-1.4.1
2-1.4.2
2-3.2.5

1. If necessary, open **Revised Media Data 1** from your solution files. Save the Revised Media Data 1 workbook as **Revised Media Data 2**, followed by your initials.
2. Point to any white area above the legend area. When the mouse pointer changes to a four-headed arrow, click and drag the **chart** to reposition it on the worksheet, aligned at the left margin under row 15.
3. The canvas is already selected. Position the mouse pointer over the upper-right corner of the canvas. When the pointer changes to a two-headed arrow, drag the **corner** of the canvas upward and to the right to increase the size of the canvas. Stop when the upper-right corner of the canvas is the width of column J.
4. With the canvas still selected, click the **CHART TOOLS DESIGN** tab. In the Chart Styles group shown in **Figure 20–19**, click the **More** button. Use Live Preview to explore the various chart styles. Click the **Style 7** chart style (first row, seventh column).

QUICK TIP
The chart is an object, just like a clip-art image or a photo. When the chart is selected, sizing handles are displayed on the canvas. You can resize the chart by dragging a sizing handle on the canvas. Be sure to drag a corner handle if you want to resize the chart proportionally.

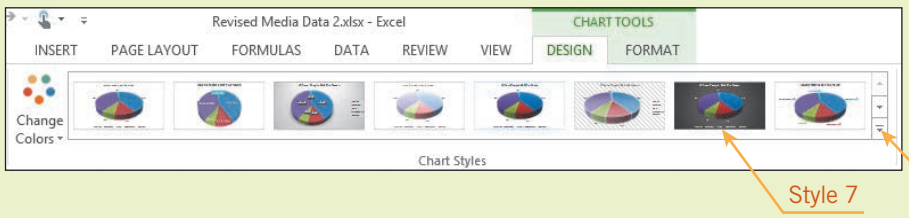


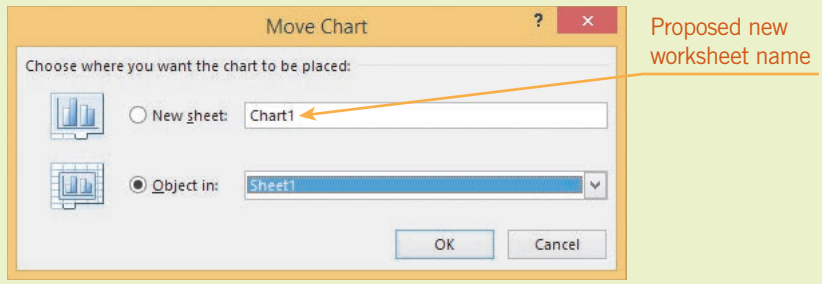
FIGURE 20–19
Chart Styles group on the CHART TOOLS DESIGN tab

5. Click the **Chart Elements** button. Point to *Legend* and then click the **Legend right arrow** and then click **Right**. Click the **legend** object to select it. Click the **HOME** tab and change the font size to **12** point.
6. Click the **41%** label on the pie chart. All the labels on the chart are selected. Change the font size to **12** point.
7. With all the labels on the chart still selected, right-click one of the **labels**. On the Mini toolbar, click the **Outline** button arrow, and then under *Standard Colors*, click a **red** color. Click a blank area in the canvas to deselect the labels.

QUICK TIP
To remove a chart element, such as the legend, select the element and then press Delete.

8. Click the **CHART TOOLS DESIGN** tab. In the Location group, click the **Move Chart** button. The Move Chart dialog box shown in **Figure 20–20** opens. The current setting shows the chart is placed as an object in Sheet1.

FIGURE 20–20
Move Chart dialog box



9. Enable the option **New sheet**. In the New sheet textbox, type **Data Chart**, and then click **OK**. A new worksheet is created with the tab name *Data Chart*. The chart is moved to the new worksheet, and the chart fills the worksheet window.
10. Save the changes to the workbook, and leave the workbook open.
11. Start **Word**, and open the file **Media Survey.docx** from the drive and folder where your Data Files folder is stored. Save the Media Survey document as **Revised Media Survey**, followed by your initials.
12. In the taskbar, click the **Revised Media Data 2** workbook button, and, if necessary, make Data Chart the active worksheet. Right-click in the blank area under the legend, and in the shortcut menu click **Copy** to copy the chart to the Clipboard.
13. Click the **Revised Media Survey** document button on the taskbar. Position the insertion point at the end of the document. Right-click to display the shortcut menu. Under *Paste Options*, click the first option **Use Destination Theme & Embed Workbook**.
14. Save the changes to the Word document, and then exit Word. Close the Revised Media Data 2 workbook, and leave Excel open for the next Step-by-Step.

Using Sparklines to Show Data Trends

VOCABULARY
sparkline

Another option for using graphics to represent data is to add a sparkline to the data. A ***sparkline*** is a tiny chart embedded in a cell. The sparkline provides a snapshot of data in a row or column, such as a trend or an increase or decrease in values. They are especially useful when you want to present and summarize data in a small amount of space.

You can insert a single sparkline for a set of data, or you can create multiple sparklines at the same time. After inserting a sparkline, you can use built-in formats to apply a color scheme, or you can customize the graphic by using commands to choose a color for high, low, first, and last values. When the data in the correlated cells change, the sparklines are immediately updated.

Step-by-Step 20.10

IC3
2-1.2.1
2-3.2.5

1. Open the file **Regional Profits** from the drive and folder where your Data Files folder is stored. Save the Regional Profits workbook as **Revised Regional Profits 1**, followed by your initials.
2. Click cell **F3**. Click the **INSERT** tab. In the Sparklines group shown in **Figure 20–21**, click the **Line** button.

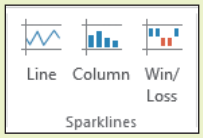


FIGURE 20–21
Sparklines group on the INSERT tab

3. The Create Sparklines dialog box opens. Drag the mouse pointer over the worksheet cells to select the range **B3:E3**. A marquee appears around the selected cells, and the range is displayed in the *Data Range* text box in the dialog box. When your settings match those shown in **Figure 20–22**, click **OK**.

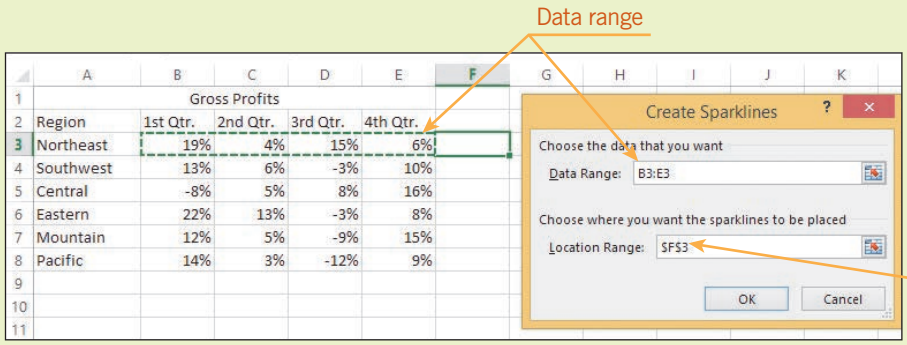


FIGURE 20–22
Selected range for sparkline

4. A tiny line graphic displays in cell F3. Drag the **F3 fill handle** and fill down to cell **F8**. The tiny graphics now display in each of the selected cells, as shown in **Figure 20–23**.

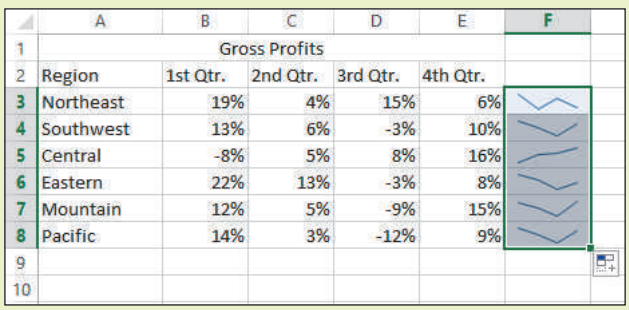


FIGURE 20–23
Line sparklines added to worksheet

5. Select the range **G3:G8**. Click the **INSERT** tab. In the Sparklines group, click the **Column** button. The Create Sparklines dialog box opens. In the worksheet, select the range **B3:E8**. Click **OK**. Tiny column graphics are now displayed in column G.

6. Select the range **H3:H8**. Click the **INSERT** tab. In the Sparklines group, click the **Win/Loss** button. In the worksheet, select the range **B3:E8**, and then click **OK**.
7. Deselect the cells. Compare your worksheet to **Figure 20–24**. Columns F, G, and H display the three different types of sparklines. The sparklines in column F show the trends, the sparklines in column G compare the values, and the sparklines in column H highlight the positive and negative values.

FIGURE 20–24
Line, Column, and Win/Loss sparklines added to worksheet

	A	B	C	D	E	F	G	H	I
1	Gross Profits								
2	Region	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.				
3	Northeast	19%	4%	15%	6%				
4	Southwest	13%	6%	-3%	10%				
5	Central	-8%	5%	8%	16%				
6	Eastern	22%	13%	-3%	8%				
7	Mountain	12%	5%	-9%	15%				
8	Pacific	14%	3%	-12%	9%				
9									

8. Click cell **D8**. Type **12**. As you press **Enter**, watch the sparklines change in cells F8:H8.
9. Select the range **F3:F8**. Click the **SPARKLINE TOOLS DESIGN** tab. In the Style group shown in **Figure 20–25**, click the **More** button to show all the color schemes. In the bottom row, select the last style, **Sparkline Style Colorful #6**. The markers are shown in black.

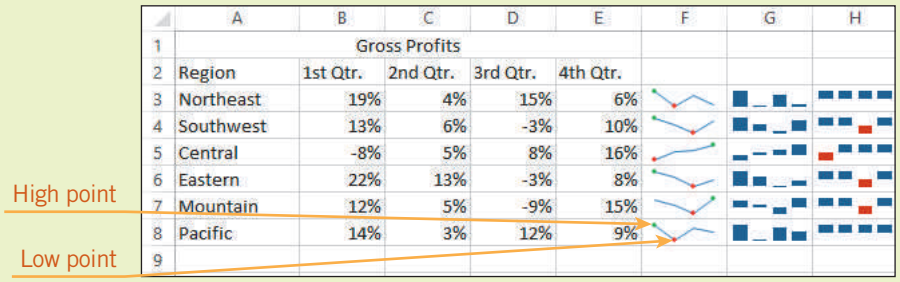
FIGURE 20–25
Style group on the SPARKLINE TOOLS DESIGN tab



10. The range F3:F8 should still be selected. In the Style group, click the **Sparkline Color** button arrow to show the color grid. In the first row under *Theme Colors*, click the **Blue, Accent 1** color. Note the color change for the markers in column F.
11. The range F3:F8 should still be selected. In the Style group, click the **Marker Color** button, and then point to *High Point*. Under *Standard Colors*, click the **Green** color. Click the **Marker Color** button, and then point to *Low Point*. Under *Standard Colors*, click the **Red** color. Deselect the cells. As shown in **Figure 20–26**, the green high points and red low points in each graphic are easily identified.

ABOVE AND BEYOND

Because a sparkline is a graphic embedded in a cell, you can enter text in the same cell, and then the sparkline will be displayed as a background image in the cell.



	A	B	C	D	E
1	Gross Profits				
2	Region	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
3	Northeast	19%	4%	15%	6%
4	Southwest	13%	6%	-3%	10%
5	Central	-8%	5%	8%	16%
6	Eastern	22%	13%	-3%	8%
7	Mountain	12%	5%	-9%	15%
8	Pacific	14%	3%	12%	9%
9					

FIGURE 20–26
Marker colors for high points and low points

12. To remove a range of sparklines in column H, select the range **H3:H8**. In the Editing group, click the **Clear** button and then in the menu click **Clear All**.
13. To remove a selected sparkline, click cell **G3**. Note that cells G4:G8 are also highlighted. Right-click the **selected cell**, and in the shortcut menu point to *Sparklines*. In the submenu, click **Clear Selected Sparklines**. To remove a group of sparklines, click cell **G4**. Right-click the selected cell, point to *Sparklines*, and then click **Clear Selected Sparkline Groups**. All the sparklines in column G are removed.
14. Save the changes, and leave the workbook open for the next Step-by-Step.

QUICK TIP

You can also access the Sparklines tool by clicking the Quick Analysis button.

Using Quick Analysis Tools to Preview Data

The Quick Analysis feature provides quick access to data-analysis tools to quickly preview worksheet data converted into visual forms including color formatting, tables, charts, and sparklines. You can also use the Quick Analysis feature to calculate totals in a worksheet.

You may have noticed the Quick Analysis button at the lower-right corner of a selected range of cells. When you click the Quick Analysis button, the Quick Analysis toolbar displays. By default, the Formatting tool gallery displays on the toolbar. You can choose from four other tools on the toolbar. As you explore the galleries for each tool, you can see live previews of the available options for converting the data. The gallery options vary depending on the type of data selected in the range.

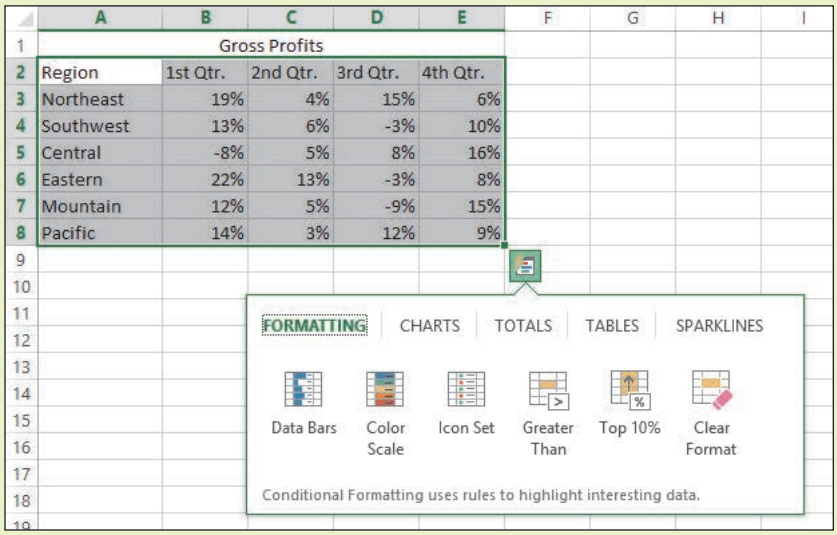
Step-By-Step 20.11

1. If necessary, open **Revised Regional Profits 1** from your solution files. Save the Revised Regional Profits 1 workbook as **Revised Regional Profits 2**, followed by your initials.
2. Select the range **F3:F8**. In the Editing group on the HOME tab, click the **Clear** button and then click **Clear All**. Deselect the cells.

IC3
2-1.2.1
2-3.2.5

3. Select the range **A2:E8**. At the lower-right corner of the selected range, click the **Quick Analysis** button. Five tools display on the Quick Analysis toolbar shown in **Figure 20–27**. The Formatting gallery options display below the five tool names.

FIGURE 20–27
Formatting gallery on the Quick Analysis toolbar



4. Hover the mouse pointer over each of the Formatting options for Live Previews for highlighting the selected data.
5. On the Quick Analysis toolbar, click the **CHARTS** tab. Hover the mouse pointer over the chart types to preview how the selected data will appear in the various chart types.
6. Click the **More Charts** button. Then click the **All Charts** tab. Here you can choose from a full range of chart types and see Live Previews of charts showing the data in the selected range. The chart options vary depending on the type of data selected.
7. Click the **Recommended Charts** tab. In the left pane, click the first recommended chart type, the **Clustered Column** chart type, and then click **OK**. The clustered chart is inserted in the worksheet. Deselect the cells.
8. Select the range **B3:E8**. Click the **Quick Analysis** button. Click the **TOTALS** tool and then click the **Average** button. The average percentages for columns B, C, D, and E are added to cells B9:E9.

9. Click cell **A9**. Type **Averages** and then press **Enter**.
10. Select the range **A2:E9**. Click the **Quick Analysis** button. Click the **TABLES** tool on the toolbar and then click the **Table** button. A table style is applied to the selected range. To change the table style, you would simply click a new style in the Table Styles group on the TABLE TOOLS DESIGN tab.
11. The A2:E9 range should still be selected. If necessary, position the mouse pointer near the lower-right corner of the selected range to show the Quick Analysis button. Click the **Quick Analysis** button. Click the **SPARKLINES** tool on the toolbar and then click the **Column** button. The mini charts are inserted in cells F3:F9. Deselect the cells.
12. Save the changes and close the workbook.

TECHNOLOGY TIMELINE

Killer Apps

Did you know that early electronic spreadsheet applications were the "killer apps" for personal computers? Killer applications are computer applications that are so necessary or desirable that they prove the core value of some larger technology, and as a result, they substantially increase the sales of the platform they run on.

VisiCalc is considered to be one of the earliest examples of a "killer app." VisiCalc, originally developed in 1978 for the Apple II computer, was one of the early electronic spreadsheet applications, and it spurred the sale of thousands of Apple II platform computers. In 1983, the Lotus Development Corporation released Lotus 1-2-3, a spreadsheet application that also offered charts and basic database operations. Shortly after Lotus 1-2-3 was released, the IBM PC became the number-one selling computer. Then in 1985, Microsoft released the first version of Excel for the Mac. Two years later, Microsoft released a new version of Excel to run in the Windows environments. This new version of Excel was one of the first applications that Microsoft introduced to run on the Windows operating system, and therefore, it was also one of the first applications developed for a graphical user interface.



SUMMARY

In this lesson, you learned:

- If you do not want the cell reference to change when the formula is moved or copied to a new location, the cell reference must be formatted as an absolute cell reference.
- Functions are special formulas that do not require operators. Excel provides more than 400 built-in functions to help you perform mathematical, statistical, and other functions.
- The AutoSum feature enables you to quickly identify a range of cells and enter a formula. For a range of cells specified in the argument, the AVERAGE function finds the average, the SUM function totals the values, and the COUNT function shows the number of cells with numerical values.
- You can use the MIN and MAX functions to find the smallest or largest number in a range.
- Formulas can reference cells in multiple worksheets, and 3D references are often used to condense and total data from other worksheets.
- If Excel cannot perform a calculation, an error value and an Error Checking button will appear to alert you and help you fix the error. Then, you can edit the formula directly in the cell or in the Formula Bar.
- A chart shows the worksheet data visually and often helps the audience understand and interpret the information more clearly. To draw logical conclusions from the data and make a correct assessment, you must ensure that the data is accurate and that you know what the values represent.
- When the worksheet data is changed, the chart is automatically updated to reflect those changes. Chart types, formats, and options can be changed at any time, even after the chart has been created.
- Instead of using charts, you can use sparklines to provide a visual representation of the data.
- The Quick Analysis tool provides a quick preview of worksheet data converted into visual forms.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. If the value in the cell changes, the formula must also be updated.

T F 2. The chart type you select will depend on the data you want to represent.

T F 3. In the order of evaluation, addition and subtraction are performed before multiplication or division.

T F 4. The COUNT function is a mathematical function.

T F 5. A formula can be as simple as a single cell reference.

MULTIPLE CHOICE

Select the best response for the following statements.

1. The result for the formula =32–(5+3)/2 is _____.
   A. 28
   C. 12
   B. 15
   D. none of the above
2. In a function formula, the _____ tells Excel what to do with the data.
   A. equal sign
   C. the argument
   B. function name
   D. none of the above
3. A _____ chart illustrates scientific data, and it specifically shows uneven intervals—or clusters—of data.
   A. line
   C. scatter
   B. pie
   D. bar
4. The _____ is a number or cell reference.
   A. operand
   C. operative
   B. operator
   D. function
5. A(n) _____cell reference is adjusted when the formula is copied or moved to a new location.
   A. embedded
   C. absolute
   B. relative
   D. fixed
6. _____ functions perform calculations that you could perform using a scientific calculator.
   A. Logical
   C. Statistical
   B. Mathematical
   D. Mass
7. To enter a cell reference into a formula, you can _____.
   A. type the cell reference in uppercase
   B. type the cell reference in lowercase
   C. click the cell you want to reference
   D. all of the above
8. A(n) _____ is a symbol that indicates the mathematical operation to perform with the operands.
   A. operator
   C. function
   B. operand
   D. operative
9. When you create a(n) _____ cell reference, the cell reference does not change when the formula is copied or moved to a new location.
   A. relative
   C. mixed
   B. absolute
   D. complex
10. The _____ function is a statistical function.
    A. COUNT
    C. MAX
    B. AVERAGE
    D. all of the above

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is the advantage of embedding a chart on the same page as the data?

2. How do you create an absolute cell reference?

3. What does Garbage In, Garbage Out (GIGO) refer to?

4. What is the purpose of a sparkline?

5. Why do many people find charts useful?

PROJECTS

PROJECT 20–1

1. Open the file **MPG Data** from the drive and folder where your Data Files folder is stored. Save the MPG Data workbook as **Revised MPG Data**, followed by your initials.
2. Enter a formula in cell C2 that will subtract the *Odometer Start* value from the *Odometer End* value.
3. Copy the formula to the range C3:C11.
4. Enter a formula in cell E2 to calculate the miles per gallon by dividing *Total Miles* by *# Gallons*.
5. Copy the formula to the range E3:E11.
6. Enter a formula in cell E13 to calculate the average miles per gallon for the range E2:E11.
7. Save the changes, and then close the workbook.

IC³
2-1.1.2
2-3.1.4
2-3.2.2

PROJECT 20–2

2-1.1.2
2-3.1.4
2-3.2.2
2-3.2.3

1. Open the file **Q2 Mileage** from the drive and folder where your Data Files folder is stored. Save the Q2 Mileage workbook as **Revised Q2 Mileage**, followed by your initials.
2. In the *April* worksheet, in cell D3, enter a formula to calculate the number of miles driven by subtracting the *Odometer Start* values from the *Odometer End* values. Fill the formula down to cover all the days of travel.
3. In the *April* worksheet, in cell E3, enter a formula to calculate the cost by multiplying the daily miles by the cost per mile (cell C26). Be sure to create an absolute reference for the cost per mile cell reference. Fill the formula down to cover all the days of travel in the worksheet.
4. Copy the formulas and the format in cells D3 and E3, and paste them to the same cells in the *May* and *June* worksheets, keeping the source formatting. Then fill the formulas down to cover all the days of travel in the *May* and *June* worksheets.
5. In the *April* worksheet, in cell D18, enter a function formula to total all the daily miles in the column. Fill the function formula to cell E18 to total all the expenses in that column. In cell E18 apply the Currency number format with two decimal places. Then copy the formulas, with the formats, to calculate the daily miles and expenses in row 18 of the *May* worksheet and row 23 of the *June* worksheet. Adjust column widths as needed.
6. In the *April* worksheet, in cell C28, enter a function formula using the values in the *Date* column to count the number of days of travel. In cells C29, C30, and C31, enter function formulas using the values in the *Daily Miles* column to calculate the minimum, maximum, and average daily miles driven during the month.
7. Copy these function formulas to the same cells in the *May* and *June* worksheets to perform the same calculations and keep the source formatting. After pasting the formulas in the *June* worksheet, edit the ranges to include all the days of travel.
8. You just learned that the cost per mile increased to $0.58 in *June*. Make this change in the *June* worksheet only.
9. Open the *2nd Qtr.* worksheet, and enter cell references for the total miles and expenses from the *April*, *May*, and *June* worksheets.
10. In the *2nd Qtr.* worksheet, in row 6, calculate the total miles and the total expenses for the 3 months.
11. Save the changes, and then close the workbook.

PROJECT 20–3

2-1.1.2
2-1.4.1
2-1.4.2
2-3.2.2
2-3.2.5

1. Open the file **Oakland Sales** from the drive and folder where your Data Files folder is stored. Save the Oakland Sales workbook as **Revised Oakland Sales**, followed by your initials.
2. In the *Eastland Store* worksheet, select the range **A5:E12**, and create a chart that you think would be most effective for this data.
3. Add the chart title **Fall Tree Sale** above the chart.
4. Add the title **Trees** for the horizontal axis and the title **Sales** for the vertical axis. Change the font sizes for the axis labels to 12 pt.
5. Move the chart so it is positioned at the left side of the worksheet and below row 15. Resize the chart so that the width of the chart does not expand beyond column C.
6. In the *Westland Store* worksheet, create a chart as described in Steps 2 through 5 using the Westland Store data.
7. In the *Eastland Store* worksheet, copy the values in the range F6:F12 to the Clipboard. Switch to the Summary worksheet, click cell **B5**, and paste the copied values so the values are pasted with the source formatting.
8. In the *Westland Store* worksheet, copy the values in the range F6:F12 to the Clipboard. Switch to the Summary worksheet, click cell **C5**, and paste the copied values so the values are pasted with the source formatting.
9. In all three worksheets, add formulas to calculate the total revenues for all columns. Adjust column widths as necessary. In the Summary worksheet, use the Format Painter to apply the same font format to the new values.
10. In the *Summary* worksheet, select the range **A4:C11**, and create an appropriate chart. Add the chart title **Fall Tree Sale**, centered and overlaid on the chart. Add titles for the vertical axis and the horizontal axis.
11. Move the chart so it is positioned on a new worksheet titled **Total Sales**. Increase the font size for the chart title label to 24 point, and increase the font size for the axis labels to 16 point.
12. Save the changes, and then close the workbook.

PROJECT 20–4

2-1.1.9
2-1.4.1
2-1.4.2
2-3.1.4
2-3.2.2
2-3.2.3
2-3.2.5

1. Open the file **City Data** from the drive and folder where your Data Files folder is stored. Save the City Data workbook as **Revised City Data**, followed by your initials.
2. Select the range **A2:B7**, and create a column chart of your choice. Change the chart title to **Population Growth**. Reposition the chart below the data, at the left side of the worksheet.
3. Change the 1990 population value to **71,436**. Change the 2000 population value to **72,818**.
4. Click cell **F2**, and enter the column heading **Population Density**. Format the heading text to wrap in the cell, and adjust the width of the column so the word *Population* is displayed on one line.
5. Click cell **F3**, and enter a formula to calculate the population divided by the area. Use the Comma style format and decrease the number of decimal places to zero. Fill the formula down for the range F4:F7.
6. Select the cell ranges **A2:A7** and **F2:F7**, and create a column chart of your choice. Add the horizontal axis title **Population per Square Mile**. Reposition the new chart below the Population Growth chart.
7. Select the ranges **A2:A7** and **D2:E7**, and create a column chart of your choice. Reposition the new chart below the Population Density chart.
8. Select the range **A2:B7**, and create a line chart of your choice. Position the new chart to the right of the Population Growth chart.
9. Select the ranges **A2:A7** and **F2:F7**, and create a line chart of your choice. Apply a style that complements the style(s) you applied to the first three charts. Position the new chart next to the Population Density chart.
10. Select the ranges **A2:A7** and **D2:E7**, and create a line chart of your choice. Reposition the chart next to the third chart.
11. Apply chart styles to all six charts to add some color to the charts. You can use one or more chart styles. Choose chart styles that complement each other and also make the data easy to read.
12. Save the changes, and close the workbook.

PROJECT 20–5

2-1.2.1
2-3.1.4
2-3.2.2
2-3.2.4
2-3.2.5

1. Open the file **Utility Summary** from the drive and folder where your Data Files folder is stored. Save the Utility Summary workbook as **Revised Utility Summary**, followed by your initials.
2. Use function formulas to calculate the following:
   a. In cell G2, calculate the total value for the range B2:F2. Then fill the formula in the cell range G3:G13.
   b. In cell B14, calculate the total value for the range B2:B13. Then fill the formula in the cell range C14:G14.
   c. In cell B16, calculate the minimum value for the range B2:B13. Then fill the formula in the cell range C16:G16.
   d. In cell B17, calculate the maximum value for the range B2:B13. Then fill the formula in the cell range C17:G17.
   e. In cell B18, calculate the average value for the range B2:B13. Then fill the formula in the cell range C18:G18.
3. In cell B20, enter an arithmetic formula to perform the following calculation: subtract the previous year average from the current year average, and then divide the results by the previous year average. Then fill the formula in the cell range C20:G20.
4. In cell H2, create a column sparkline to compare the five utility expenses in the range B2:F2. Then fill the formula in the cell range H3:H14. Change the color scheme as desired.
5. In cell B15, create a line sparkline to show the trend of the Electric expenses in the range B2:B13. Then fill the formula in the cell range C15:G15. Change the sparkline color and the marker colors for the high point and low point.
6. In the cell range B21:G21, create a Win/Loss sparkline to provide a visual aid of the positive and negative values in the range B20:G20.
7. Save the changes, and close the workbook.

TEAMWORK PROJECT

As you have learned in this lesson, functions can help you analyze data in a number of ways. Excel includes hundreds of functions to help you with financial, statistical, mathematical, and other problems. In this project, explore two functions of your choice with a partner to learn how the functions can be applied to specific data analysis situations. Make sure your functions are not covered in this lesson. Follow these steps:

2-1.1.8
2-3.2.2

1. In a blank Excel worksheet, show the FORMULAS tab. Review the functions in the Function Library group to choose two functions you are interested in exploring with your teammate. (Your functions should come from two different categories.)
2. Read the Excel Help files and visit the Microsoft.com Web site to learn about the functions you have chosen. Gather information about the kind of data the function can analyze and what kinds of information you must supply as arguments for the functions. Consider where this type of data might occur, such as the type of job where you would encounter it.
3. Save the worksheet as **TP 20–1**, followed by your initials.
4. Construct the worksheet(s) containing data appropriate for each function, and then use the functions to calculate the data.
5. After you are sure you are using the functions correctly, save the changes to the workbook.
6. Make a team presentation to share what you have learned about the functions you explored.

CRITICAL THINKING

CRITICAL THINKING 20–1

2-3.2.5

To complete this activity, you must first complete Project 20–4.

1. Open the file **Revised City Data** from your solution files.
2. Create a new Word document, and save the document as **CT 20–1**, followed by your initials. Analyze the charts in the Revised City Data workbook to answer the following questions:
   a. How does the Population Growth chart differ from the Population Density chart?
   b. What, if anything, can we learn from the charts comparing houses and vehicles?
   c. Compare the charts on Sheet1 that show the data for Housing Units and Vehicle Registration. Why does the comparison of the combined data look different from the data in the line charts?
   d. What other questions can be answered with this data?
3. Save the changes, and close the Word document. Close the Revised City Data workbook without saving any changes.

CRITICAL THINKING 20–2

2-3.2.5

To complete this activity, you must first complete Project 20–5.

1. Open the file **Revised Utility Summary** from your solution files.
2. Create a new Word document, and save the document as **CT 20–2**, followed by your initials.
3. Using the sparklines in column H to analyze the data, identify the two most expensive utilities, and comment on the seasonality of the two.
4. Using the sparklines in row 15 to analyze the data, describe the trends for each of the utilities.
5. Save the changes, and close the Word document. Close the Revised Utility Summary workbook without saving any changes.

ONLINE DISCOVERY

There are many online Web sites available to help you find current gasoline prices.

1. Choose four locations around the country (the East coast, the West coast, the Gulf coast, and the Midwest).
2. Create a new workbook, and save the workbook as **OD 20–1**, followed by your initials.
3. Track the gas prices daily for all four locations for at least 7 to 10 days. Also, track the price of a barrel of oil for each of those days.
4. Create a chart to illustrate the data.
5. Save the changes to the workbook.

2-3.2.5

JOB SKILLS

In this lesson, you learned about using charts and sparklines to create graphics to represent data. Now that you are familiar with Excel and its features, consider how you can use Excel charts and/or sparklines on the job or for personal use to help you organize and maintain data.

1. Create a new Word document, and save the document as **JS 20–1**, followed by your initials.
2. List how you can use Excel charts and sparklines.
3. Save the changes, and close the document.

2-3.2.5

EXPLORE AND SOLVE

In this lesson, you learned how to track changes in documents, which is especially useful when you share a document with others. Explore the Excel features and then follow the steps, highlight changes in an Excel worksheet.

1. Open the file **Meal Orders.xlsx** from the drive and folder where your Data Files folder is stored. Save the Meal Orders workbook as **ES 20–1**, followed by your initials.
2. Enable the feature to track changes while editing. Choose the following settings for highlighting:
   a. All changes
   b. From everyone
   c. For the entire range of cells A1:D39
3. The first two orders in the worksheet are incorrect. Castillo ordered vegetarian entrée for $35.50 and Schmidt ordered the chicken entrée for $37.50. Make the necessary edits.
4. Save the changes to the workbook and then close the workbook.
5. To confirm that the changes were tracked, reopen the **ES 20–1** workbook. To view the tracked changes, you will need to change the default settings to show all the highlighted changes.
6. Close the workbook and exit Excel.

2-3.2.5



Estimated Time:
1.5 hours

LESSON 21

Getting Started with PowerPoint Essentials

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Identify the parts of the PowerPoint screen and navigate through a presentation.
- Change the slide view and magnification.
- Manage slides by adding, deleting, duplicating, and reordering them.
- Create a new presentation with effective planning.
- Apply a theme for consistent formatting and styles.
- Edit slide content by moving text and modifying placeholders.
- Work with a Slide Master to add universal elements for all slides in the presentation.
- Preview a presentation using Slide Show view.
- Hide slides and create custom slide shows.

WORDS TO KNOW

Outline tab
presentation
slide
slide layout
Slide Master
slide pane
Slides tab

DATA FILES

To complete this lesson, you will need these data files:

3Rs.pptx
International Students.pptx
Logo.jpg
Search Tips.pptx

Microsoft product screenshots used with permission from Microsoft Corporation.

PowerPoint helps you create, edit, and manipulate professional-looking slide shows that you can use to facilitate meetings, supplement classroom learning, and share information using a wide variety of media including graphics, pictures, and audio and video clips. Creating a slide show may seem like an overwhelming task, but PowerPoint provides many features that make that task easy and fun.

Identifying the Parts of the PowerPoint Screen

VOCABULARY

presentation

slide

Slides tab

slide pane

In PowerPoint, the document file is called a presentation. A ***presentation*** is a collection of individual slides for an onscreen display of information and graphics. A ***slide*** is a single page of a presentation.

When you first start PowerPoint, you can choose to open an existing presentation or create a new blank presentation. As in other Office applications, you can quickly access the most recently opened presentations. You can search for additional presentations by using the Open Other Presentations command.

The PowerPoint application window shows many familiar parts, including the Ribbon, Quick Access Toolbar, title bar, sizing buttons, Close button, and status bar. Scroll bars are displayed when the presentation includes more than one slide. After the application has started, you can also use Backstage view to open existing presentations and save revised or new presentations.

The ***Slides tab*** shows a thumbnail for each slide in the presentation file. The ***slide pane*** in the presentation window contains the slide content. The dotted borders in the slide pane identify placeholders where you can insert text and graphics on the slide.

Touchscreen Users

The instructions in the PowerPoint lessons generally provide directions for using a mouse to access commands and features. For example, the instructions may refer to actions such as *point, click, double-click*, or *right-click*. If you are using a touch screen, you can use gestures such as *press, tap, slide, swipe*, and *drag* instead of following the directions for using the mouse.

Step-by-Step 21.1

1. To start the application, open the Start screen. If necessary, scroll through the Start screen tiles, and then click the **PowerPoint 2013** application tile. Recently accessed presentations appear in the pane on the left, and templates for creating new presentations appear in the template gallery on the right. You can search for more templates and themes online.
2. In the template gallery, click the **Blank Presentation** thumbnail. A new presentation titled *Presentation1* is opened. Compare your screen with **Figure 21–1** to identify the various components of the PowerPoint presentation window and their names.

IC3
2-1.3.1
2-1.3.2
2-1.3.3
2-1.3.4

QUICK TIP

If you are using Windows 7 or Vista, click the Start button, click All Programs, click Microsoft Office 2013, and then click PowerPoint 2013.

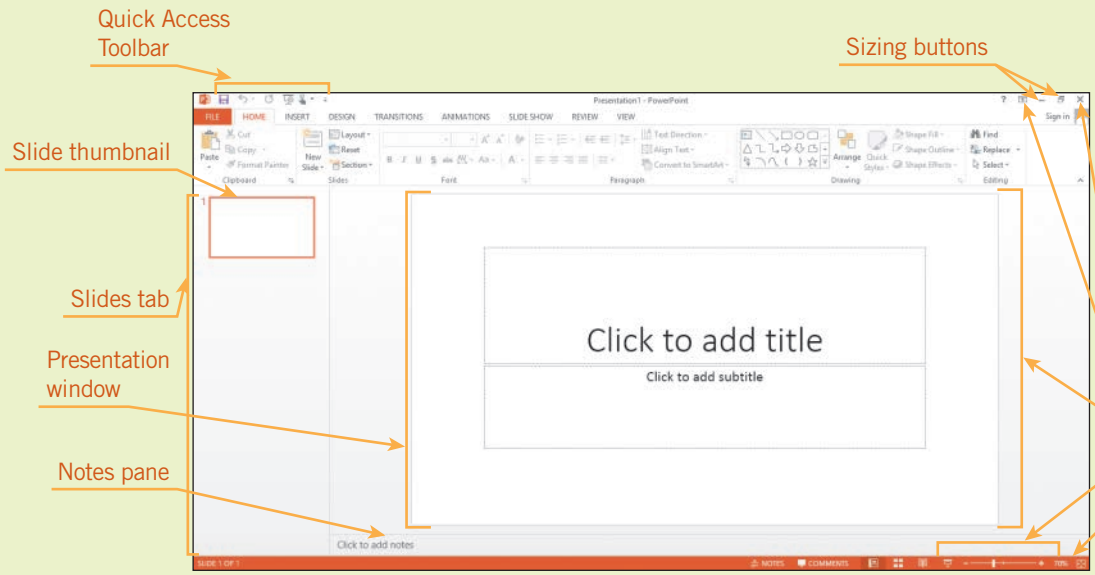


FIGURE 21–1
PowerPoint application window

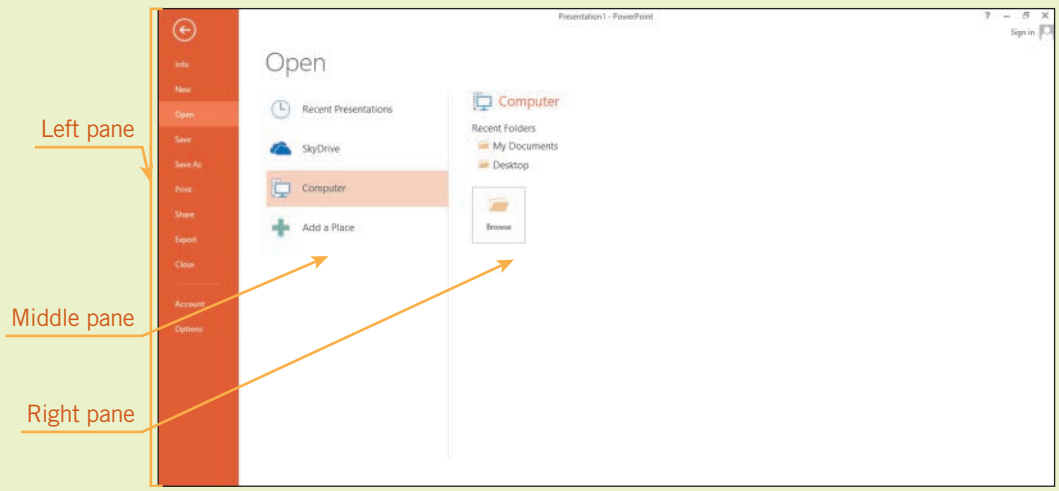
3. Move the mouse pointer around the application window. When you position the mouse pointer over the Slides tab and the Ribbon, the mouse pointer is displayed as an arrow. When you position the pointer within the slide pane, it is still displayed as an arrow, but when you position the pointer over a placeholder in the slide pane, the pointer changes to an I-beam, which indicates you can add text inside the placeholder.
4. If necessary, click the **Maximize** button to change the size of the window to fill the screen. If the Restore button is displayed instead of the Maximize button in the upper-right corner of the screen, the application window is already maximized.
5. Click the **Minimize** button in the row of sizing buttons. The application window is minimized. Click the **Presentation1 - PowerPoint** button in the taskbar to restore the application window.

6. Click the **Restore Down** button to reduce the application window size. The Ribbon, the Slides tab, and the slide pane adapt to a smaller size.
7. Click and drag the **title bar** downward to move the application window around on the screen. Then point to a corner of the window's border, and when the pointer changes to a double-headed arrow, click and drag the **border** to resize the width of the window.
8. Click the **Maximize** button to restore the window to its full size.
9. Click the **FILE** tab to open Backstage view. In the left pane, click **Open**, and then in the middle pane, click **Computer**, as shown in **Figure 21–2**. In the right pane, click the **Browse** button. The Open dialog box opens.

QUICK TIP

You can also maximize the application window by dragging the window to the top of the screen.

FIGURE 21–2
Backstage view



10. Navigate to the drive and folder where your Data Files folder is stored. Select the filename **3Rs.pptx**, and then click **Open**.
11. Click the **FILE** tab, and then click **Save As**. If necessary, click **Computer** in the middle pane. In the right pane, click the **Browse** button. The Save As dialog box opens.
12. In the Save As dialog box, navigate to the drive and folder where you save your solution files. In the *File name* box, type the new filename **Revised 3Rs 1**, followed by your initials, and then click **Save**.
13. Leave the presentation open for the next Step-by-Step.

Navigating Through a Presentation

You can move to a different slide in a presentation using the keyboard by clicking the thumbnail on the Slides tab. You can also use the vertical scroll bar or the keyboard to navigate through slides in the Slides tab. The Help feature is useful for finding alternative ways to navigate, such as keyboard shortcuts.

Step-by-Step 21.2

1. If necessary, open the file **Revised 3Rs 1** from your solution files. Compare your screen to **Figure 21–3**. Slide thumbnails are displayed in the Slides tab on the left, and the status bar shows *SLIDE 1 of 8*. A vertical scroll bar is displayed next to the thumbnails, and there is also a vertical scroll bar on the right side of the presentation window.

IC3
2-1.1.3
2-1.1.8
2-1.1.9



FIGURE 21–3
Revised 3Rs 1 presentation window

2. Press the **down arrow** key. The application window changes to show the second slide in the slide pane. Notice that the second slide is now selected on the Slides tab, indicating that it is the active slide.
3. Press the **Page Up** key to move to the previous slide, and then press the **Page Down** key to move to the next slide. The second slide is the active slide. If the Page Up and Page Down keys do not work, press the **NumLock** key and then try again.
4. On the Slides tab, click the **slide 3** thumbnail. Again, the slide pane adapts, and the selected thumbnail shows the active slide.
5. Use the vertical scroll bar on the Slides tab to scroll down and show the thumbnail for the last slide in the presentation. Then click the **slide 8** thumbnail.

QUICK TIP

If your mouse includes a scroll wheel, you can use the wheel to navigate through the slides both forward and backward in Normal view.

6. On the right side of the presentation window, drag the **scroll box** up the vertical scroll bar. As you drag the box, a ScreenTip to the left of the scroll bar shows the title and number of the slide. When you see *Slide: 2 of 8 Copyright on the Internet*, as shown in **Figure 21–4**, release the mouse button. The second slide of the presentation is displayed in the slide pane, and the slide 2 thumbnail is selected on the Slides tab.

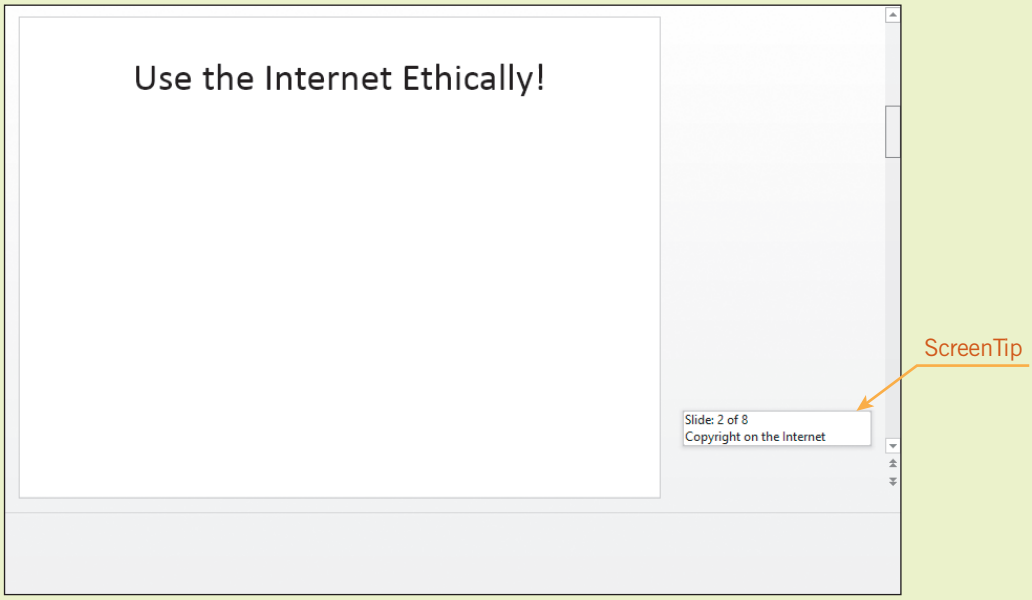


FIGURE 21–4
Dragging the scroll box to navigate the slides

7. At the bottom of the vertical scroll bar on the right side of the presentation window, click the **Next Slide** button three times. Each time you click the Next Slide button, you move to the next slide in the presentation. The fifth slide should be active.
8. At the bottom of the vertical scroll bar, click the **Previous Slide** button. Each time you click the Previous Slide button, you move to the previous slide in the presentation. The fourth slide should be active.
9. Press **Ctrl+Home**. The first slide becomes the active slide. Press **Ctrl+End** to move to the last slide.
10. If you do not have an Internet connection, go to Step 14. If you have an Internet connection, go to Step 11.
11. In the upper-right corner of the PowerPoint window, click the **Help** button to open the PowerPoint Help dialog box. Click the **Search online help** box. Type **keyboard shortcuts** and then press **Enter**.
12. Click the link **Keyboard shortcuts for use while creating a presentation in PowerPoint 2013**.

13. Scroll down to the heading *Common tasks in PowerPoint*. Under that heading, click the link **Move between Panes**. Review the three tips for keyboard shortcuts, and then close the Help dialog box.
14. Leave the presentation open for the next Step-by-Step. If you must close the presentation, do not save any changes.

Changing the Slide View

PowerPoint offers five different ways to view your presentation. **Table 21–1** describes each of the views. Normal is the default view and the view you have used so far in PowerPoint. You will explore the Outline, Slide Sorter, and Reading views in the next Step-by-Step. You will learn more about the Notes Page and Slide Show views later in this lesson.

When active, the ***Outline tab*** shows the text on each slide, and it enables you to edit the text and navigate and organize the slides in the presentation.

VOCABULARY
Outline tab

Like other Office applications, you can change the magnification of the content on the screen by using the Zoom button in the Zoom group on the VIEW tab, or by using the zoom controls in the status bar at the bottom of the window. Before changing the zoom setting, you must click the Slides tab, the Outline tab, or the slide pane to indicate where you want to change the zoom level. You can use the Fit to Window command to automatically fit the slide pane in the available space in the application window.

TABLE 21–1 Presentation Views

VIEW	DESCRIPTION
Normal	Default view; enables you to edit slides and navigate through slides using thumbnails
Outline	Enables you to navigate through slides and organize the slides
Slide Sorter	Provides thumbnails of each slide for an overall picture of the presentation; enables you to easily add and delete slides, copy slides, and rearrange the order of the slides
Notes Page	Enables you to view and edit notes and see how the notes will look when printed
Reading	Enables user to view slides without switching to a full-screen slide show
Slide Show	The current slide fills the whole screen; use this view when you present the show to your audience

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Step-by-Step 21.3

2-1.1.3
2-1.1.9
2-1.3.6

1. If necessary, open the file **Revised 3Rs 1** from your solution files.
2. Click the **VIEW** tab. In the Presentation Views group, shown in **Figure 21–5**, click the **Outline View** button. The Outline tab displays on the left. All of the text contained on each of the eight slides in the presentation is displayed in outline form as shown in **Figure 21–6**.

FIGURE 21–5
Presentation Views group on the VIEW tab

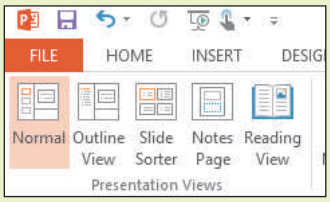
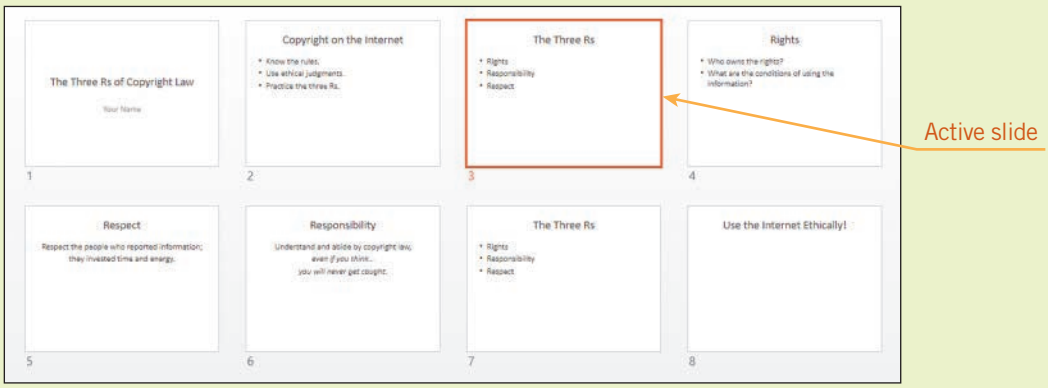


FIGURE 21–6
Outline tab for Revised 3Rs 1 presentation



3. On the Outline tab, click the slide 3 title, **The Three Rs**. The slide pane changes to show the content for the third slide.
4. In the Presentation Views group, click the **Slide Sorter** button. The window changes to show small images (but bigger than thumbnails) of the slides in the presentation. All the slides are displayed in the window, as shown in **Figure 21–7**. The active slide is selected. (The layout on your screen may differ somewhat.) Note that the Slides/Outline tab is no longer displayed.

FIGURE 21–7
Slides shown in Slide Sorter view



5. Double-click **slide 6**. The view changes back to Outline view. In the Presentation Views group, click the **Normal** button.
6. Scroll up the Slides tab, and then click the **slide 3** thumbnail. Clicking inside the Slides tab indicates you want to change the magnification of the Slides tab. In the Zoom group shown in **Figure 21–8**, click the **Zoom** button to show the zoom level options. In the Zoom dialog box, click to enable the **33%** option, and then click **OK**. The magnification of the thumbnails on the Slides tab is decreased. The width of the presentation window increases, but the magnification of the slide pane remains the same.

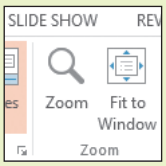


FIGURE 21–8
Zoom group on the VIEW tab

7. Click anywhere in the slide pane to indicate you want to change the magnification of the slide pane. Click the **Zoom** button, change the magnification to **100%**, and then click **OK**. The magnification for the slide pane changes but the magnification remains the same on the Slides tab.
8. In the Zoom group, click the **Fit to Window** button. The slide pane is adjusted to fit within the available space.
9. On the Slides tab, click the **slide 4** thumbnail. Click the **Zoom** button, change the zoom level to **66%**, and click **OK**. The width of the Slides tab is increased, and the width of the presentation window is adjusted to fit in the available space. The magnification for the slide pane remains the same.
10. In the status bar at the lower-right corner of the window, click the **Slide Sorter** button shown in **Figure 21–9**. Then click the **Reading View** button on the status bar.

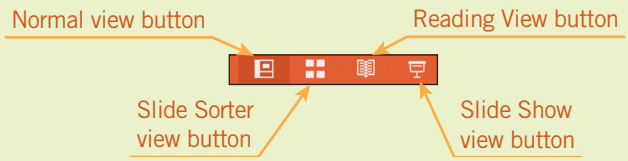


FIGURE 21–9
View buttons on status bar

QUICK TIP

If your mouse has a scroll wheel, you can use the wheel to navigate through both forward and backward in Reading view.

11. To navigate through the slides in Reading view, you can use the buttons on the status bar in the lower-right corner of the screen. See **Figure 21–10**. Click the **Next** button three times to review some of the slides, and then click the **Previous** button twice.

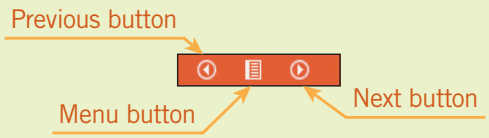


FIGURE 21–10
Reading view buttons on the status bar

12. On the status bar, click the **Menu** button to display a menu of commonly used commands. In the menu, point to *Go to Slide*. In the submenu shown in **Figure 21–11**, click **1 The Three Rs of Copyright Law**. The first slide in the presentation is now displayed.

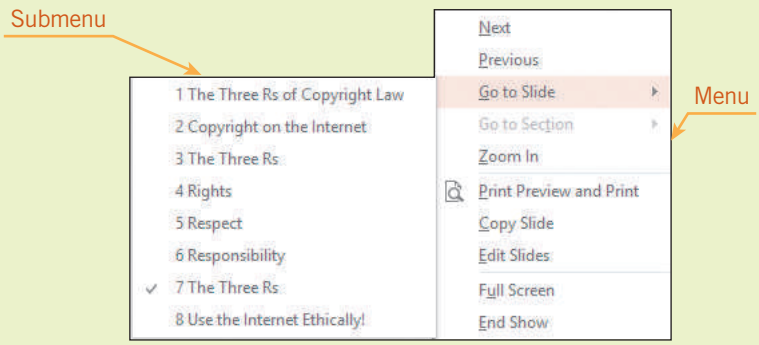


FIGURE 21–11
Menu and submenu in Reading view

13. Right-click anywhere in the slide to display the shortcut menu. At the bottom of the menu, click **End Show**. The presentation is displayed in the previous view, which in this case is Slide Sorter view. On the status bar, click the **Normal** view button to return to the default view.
14. Save the changes, and leave the presentation open for the next Step-by-Step.

Managing Slides

As you prepare a presentation, it is common to add new slides, copy slides, and delete slides. It is also common to rearrange the sequence of the slides. You can easily manage the slides in Normal view and in Slide Sorter view.

You can use the Cut, Copy, and Paste commands to copy or move slides. The slide content, layouts, and formats are stored on the Clipboard. Remember that the Clipboard is a temporary storage place in the computer's memory. You can paste Clipboard items as many times as you want.

You can change the order of the slides by using drag-and-drop editing as well as by using the cut-and-paste method. It may be a little easier to use drag-and-drop editing in Slide Sorter view, where all the slides are arranged in rows in one screen, but you can also rearrange slides in the Slides tab in Normal view and in the Outline tab in Outline view.

Step-by-Step 21.4

1. If necessary, open the file **Revised 3Rs 1** from your solution files. Save the Revised 3Rs 1 presentation as **Revised 3Rs 2**, followed by your initials.
2. On the Slides tab, click the **slide 4** thumbnail. Click the **HOME** tab. In the Slides group shown in **Figure 21–12**, click the **New Slide** button. (Do not click the arrow on the button.) A new blank slide is created and placed after slide 4. The placeholders for the new slide are the same as those on slide 4. Note the Slides tab is updated and shows the new blank slide, slide 5, as the active slide.

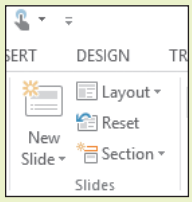


FIGURE 21–12
Slides group on the HOME tab

3. In the Slides tab, click the **slide 4** thumbnail. Click the **New Slide** button arrow, and then at the bottom of the menu click **Duplicate Selected Slides**. The active slide is duplicated, and the new slide 5 shows the same content as slide 4. The new slide 5 is the active slide.
4. Select the **slide 3** thumbnail. In the Clipboard group, click the **Copy** button. The blank slide is copied to the Clipboard.
5. On the Slides tab, scroll down and click between the **slide 7** and **slide 8** thumbnails. A solid red horizontal line indicates the location of the insertion point. In the Clipboard group, click the **Paste** button. Slide 3 is copied to the designated location, and the active slide is now the new slide 8.
6. Click the **slide 6** thumbnail. Press **Delete**. The slide is removed from the presentation.
7. On the status bar, click the **Slide Sorter** button Click the **VIEW** tab. In the Zoom group, click the **Zoom** button, change the zoom level to **66%**, and click **OK**.
8. Click between **slide 4** and **slide 5** to position the insertion point between the two slides. The insertion point will appear as a solid red vertical line between the two slides. Click the **HOME** tab, and in the Slides group click the **New Slide** button. A new blank slide is inserted to the right of slide 4 and is a blank slide 5. There are now a total of 11 slides in the presentation, and slide 5 is active.

IC3
2-1.1.2
2-1.1.6
2-1.1.9
2-1.3.6
2-4.2.1
2-4.2.3

ABOVE AND BEYOND

You can select multiple slides and delete or copy and paste them. To select a series of slides, on the Slides tab click the first slide thumbnail in the series, press and hold Shift, and then click the last slide thumbnail in the series. All thumbnails between and including the two thumbnails you clicked are selected. To select noncontiguous slides, click the first slide thumbnail, press and hold Ctrl, and then click the remaining slide thumbnails you want to include in the selection.

9. Press and hold **Ctrl**, and click **slide 6** and **slide 8**. Three slides are selected. Press **Delete**. All three selected slides are removed, and now there are eight slides in the presentation.
10. Click **slide 6**. In the Clipboard group, click the **Cut** button to save the slide to the Clipboard. Then, click to the left of slide 4 to position the mouse pointer between slide 3 and slide 4. The red vertical line should appear to the left of slide 4. Click the **Paste** button to move the slide to the new position.
11. Click **slide 6**, and drag it to position it between slide 3 and slide 4. Release the mouse button, and the slides are once again rearranged.
12. Click the **VIEW** tab and then in the Presentation Views group, click the **Outline View** button. Point to the small *slide 6 icon*. When the pointer changes to a four-headed arrow, click and all the text for the slide is selected. Then with the four-headed arrow still positioned over the slide icon, click and drag the **icon** and position the mouse pointer above slide 4. When you see the gray horizontal line above slide 4, release the mouse button, and the slides are rearranged.
13. In the Presentation Views group, click the **Normal** button. On the Slides tab, click the **slide 6** thumbnail and then drag and drop the **thumbnail** so it is positioned between slide 4 and slide 5.
14. Save the changes. Click the **FILE** tab, and then click **Close** to close the presentation. (If you click the Close button in the application window, the presentation and the application will both close.)

Creating a New Presentation

PowerPoint provides several options for creating a new presentation. You can create a new blank presentation and apply preformatted colors, styles, and layouts. PowerPoint provides several presentation templates that already contain formatted content that you can modify to customize the presentation for your needs. You can also open an existing presentation, save it with a new filename, and then add and delete slides and edit the existing slides.

When you create a presentation, it is important to keep in mind a few basic principles for effective design. PowerPoint offers so many templates and designs that it is tempting to use many different layouts and formats in your presentation. But if your presentation is too busy, the formatting can detract from your content. You want the design features you choose to emphasize your content, not overwhelm it. Following are a few design guidelines to keep in mind when you are creating a presentation.

- Do not overload a slide with too much content; include only essential information to keep your message clear and concise.
- Select only one or two fonts that are easy to read, and use the same fonts for the same features in all the slides in a presentation to create a consistent appearance.
- Use numbered lists to show the steps in a process or data that should be examined in order.

- Use bullets to present lists of information.
- Limit the number of special features, such as bullets, numbered items, or graphics, on a single slide.
- Use graphics or charts only to highlight relevant information. Do not use graphics just to decorate a slide.
- Tables and charts can illustrate numerical data or trends, but keep the charts simple and easy to read.
- Add elements such as a company name for consistency from slide to slide.

When you create a new blank presentation, the file opens with one blank slide with a proposed slide layout. ***Slide layout*** refers to the arrangement of placeholders on the slide. The placeholders provide placement guides for adding text or objects such as pictures, tables, or charts. Most presentations begin with a title slide. You can choose from several different slide layouts. To modify the slide layout, you can resize the placeholders and move them to another position in the slide pane. If you do not use a placeholder, you can leave it empty, or you can delete it. An empty placeholder will not appear in Slide Show view or when the slide is printed.

VOCABULARY
slide layout

To add text to a slide or to manipulate the text on a slide, the presentation must be shown in Normal view. You can add text in the placeholders in the slide pane, or you can add text in the Outline tab. When you fill a placeholder with several lines of text and keep entering text, PowerPoint reduces the font size as needed so all the text fits inside the text box. If there are not enough placeholders in the slide layout, you can add new text boxes.

As you type text in a placeholder, PowerPoint automatically checks for misspelled words. However, you must also proofread all of your work because the spelling checker will not identify all spelling errors. The AutoCorrect feature is also available, and PowerPoint automatically corrects common spelling errors. For example, when you type *teh* it is automatically corrected to *the*.

The Notes pane provides a place for you to write speaker notes that you can use to provide reminders about information you want to emphasize. The notes are not displayed on the slide when the presentation is shown in Slide Show view. There is plenty of space available for notes, so you can even include the dialogue you want to use when you present the slide show to an audience.

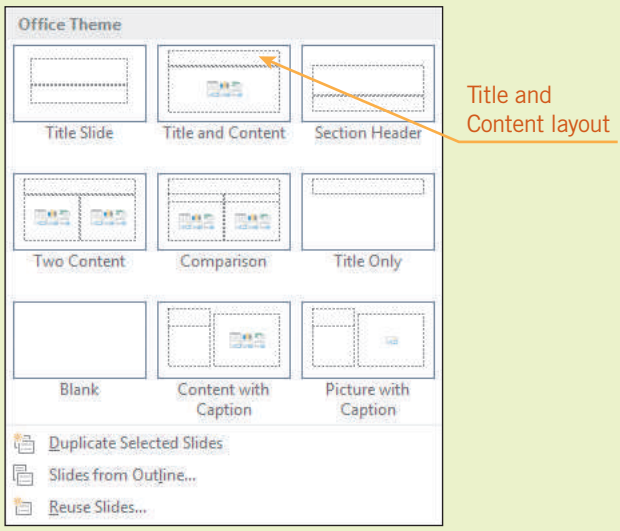
Step-by-Step 21.5

IC3
2-1.1.5
2-1.3.2
2-1.3.3
2-1.3.6
2-4.1.1
2-4.3.1

1. Click the **FILE** tab, and then click **New**. In the template gallery, click the **Blank Presentation** thumbnail. A new presentation with one blank slide opens.
2. The slide pane shows a slide layout for a Title Slide with a title placeholder at the top and a subtitle placeholder below. In the title placeholder, click anywhere within the placeholder text **Click to add title**. The placeholder text disappears. Type **A New Country,** press **Enter**, and then type **A New Experience**.
3. In the subtitle placeholder, click anywhere within the placeholder text **Click to add subtitle**, and type your first and last names. Notice the font sizes are different. These are the default settings for the Title Slide layout.

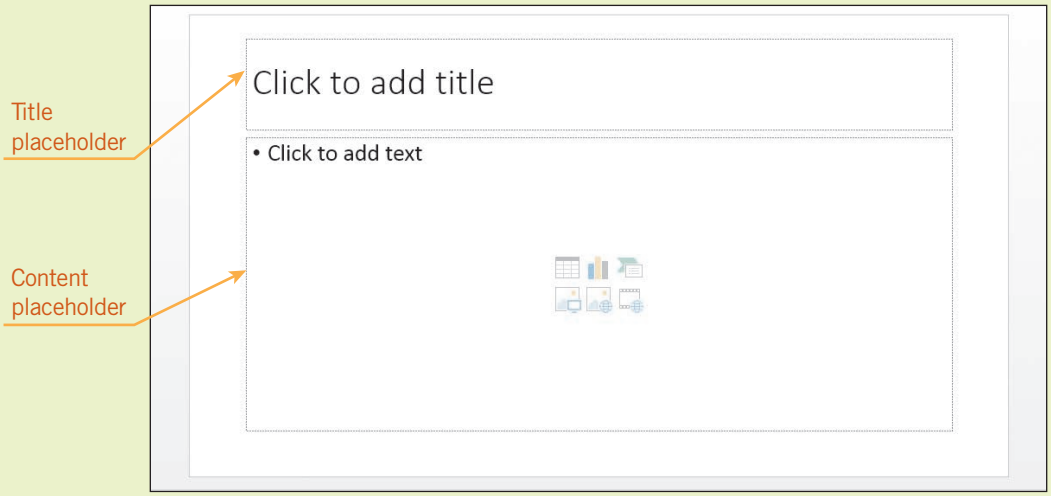
4. Click the **HOME** tab. In the Slides group, click the **New Slide** button arrow. The slide layout options shown in **Figure 21–13** are displayed.

FIGURE 21–13
Slide layout options



5. Click the **Title and Content** layout. A new slide is created with two placeholders, as shown in **Figure 21–14**.

FIGURE 21–14
Title and Content layout



6. Click the title placeholder text **Click to add title**, and type **Open your door to teh future...** in the placeholder. Note that PowerPoint automatically corrects the misspelled word teh.
7. Move the mouse point over the object buttons in the content placeholder to see the options. You use these buttons to enter tables, charts, graphics, and video clips, which you will learn about in Lesson 22.
8. Click the content placeholder text **Click to add text**. Type **An international education is important.** and then press **Enter**. The line of text is formatted with a bullet. A dimmed bullet is displayed for the new blank paragraph, but it will not show in Slide Show view if you do not type text on this line.

ABOVE AND BEYOND

You can add words to the AutoCorrect list in the AutoCorrect English (United States) dialog box. To open the dialog box, click File, click Options, click Proofing, and then click AutoCorrect Options.

9. Type **Fluency in another language is valued.** and then press **Enter**. The second paragraph of text is also formatted with a bullet.
10. Click the **VIEW** tab. In the Show group, click the **Notes** button. In the Notes pane below the slide pane, click the notes placeholder text **Click to add notes**. Type **Ask how many in the audience can speak a foreign language.** and press **Enter**. The note you entered is not displayed in the thumbnail on the Slides tab. Notes do not display in the Outline tab either.
11. In the Presentation Views group, click the **Notes Page** button. The slide pane changes to show an image of the slide with the Notes directly below. This view is better for entering and viewing a long note or editing text in an existing note.
12. In the Presentation Views group, click the **Normal** button. Click the **HOME** tab. Click the **New Slide** button. A new slide 3 opens with the same slide layout as the previous slide. You only need to click the New Slide button arrow when you want to change the slide layout for the new slide.
13. Type **Get Involved** in the title placeholder. Then type the following three lines of text in the content placeholder:

    Become a volunteer.
    Become an exchange student.
    Become a host family.
14. Save the presentation as **International 1**, followed by your initials. Leave the presentation open for the next Step-by-Step.

ABOVE AND BEYOND

In Normal view, you can only add text to the Notes pane. In Notes Page view, you can add graphics or other elements to the speaker notes, and you can change the notes layout and background.

Applying a Theme

You can easily give your presentation a professional look by applying a theme, which specifies a color scheme, fonts, and effects. Each theme has a specific look and feel. The theme you choose for your presentation should reflect the tone of the presentation topic. Moreover, the theme should not detract from the message you want to deliver.

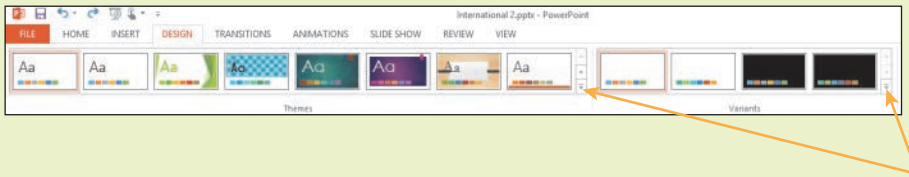
A theme is applied to all the slides, but the content of the slides does not change. You can apply a different theme at any time to change the look of your presentation. PowerPoint offers four variants for each theme, which provide predefined sets of theme colors. You can use the variants to change the color scheme of the theme without affecting the overall look of the theme. If the variants do not meet your needs, you can choose from a palette of theme colors. You can also change the set of theme fonts.

Step-by-Step 21.6

2-1.2.1
2-1.2.2

1. If necessary, open the file **International 1** from your solution files. Save the International 1 presentation as **International 2**, followed by your initials.
2. Move to slide 1. Click the **DESIGN** tab. In the Themes group shown in **Figure 21–15**, move the mouse pointer over several of the options to see the Live Preview of the themes. The theme names appear in ScreenTips.

FIGURE 21–15
Themes group and Variants group on the DESIGN tab

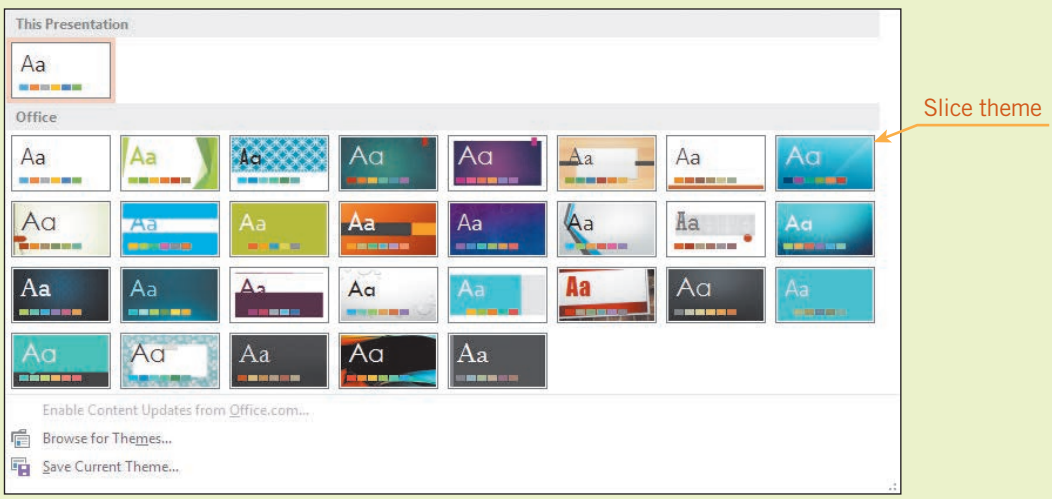


QUICK TIP

If you do not find a design in the Themes gallery that meets your needs, you can look for more designs at Microsoft Office Online.

3. Click the **More** button to show all the theme options, as shown in **Figure 21–16**. Click the **Slice** theme (first row, eighth column). The theme is applied to all slides in the presentation, and the slide pane changes to show the updated font styles, alignments, and colors. You will notice by looking at the thumbnails on the Slides tab that the first slide in the presentation has a bolder graphic than the other two slides. That is because the first slide is formatted as the title slide.

FIGURE 21–16
Theme gallery



4. In the Variants group on the DESIGN tab, move the mouse pointer over the four options to see the Live Preview of each variant. Click the fourth option, the **orange** variant.
5. In the Variants group, click the **More** button and then in the menu click **Colors** to show a palette of color schemes from which you can choose. Click outside the palette to close it.

6. In the Variants group, click the **More** button and then in the menu click **Fonts** to show a gallery with the built-in font options. See **Figure 21–17**. Use the scroll bar to move down through the list of fonts. Move the mouse pointer over some of the options to see the Live Preview. Click the **Calibri** option. The new font style is applied to all the slides.

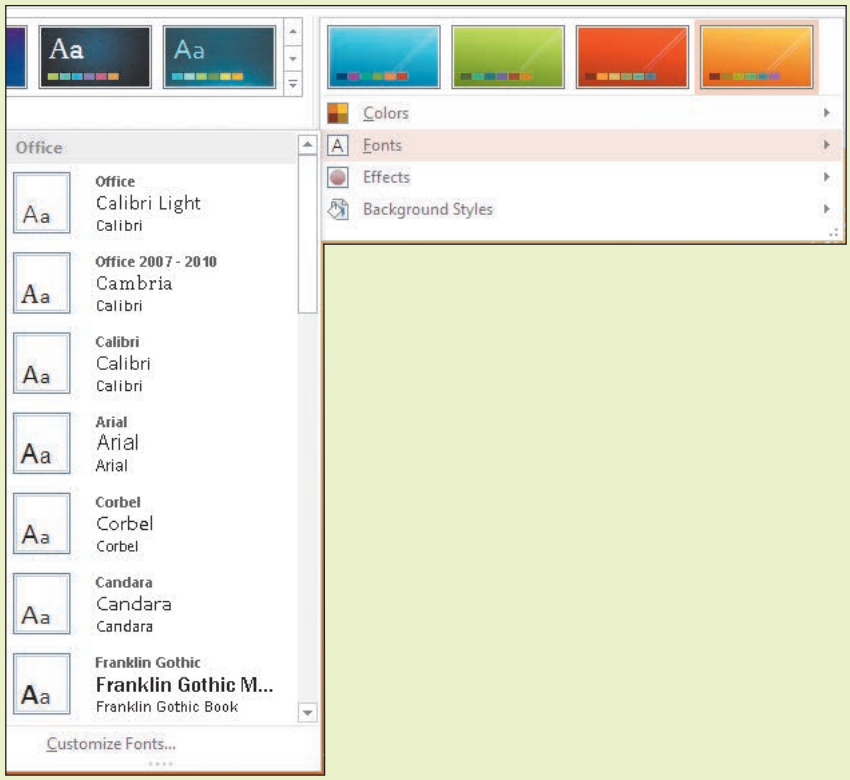


FIGURE 21–17
Fonts gallery

7. In the Variants group, click the **More** button and then click **Effects** to show the built-in effects. When you move the mouse pointer over the options to see the Live Preview, you will not see many changes. That is because the theme effects are sets of lines and fill effects, which apply to graphics such as AutoShapes, WordArt, and SmartArt. Click outside the list of options without making any changes.
8. In the Variants group, click the **More** button and then click **Background Styles**. The options shown in **Figure 21–18** are displayed.

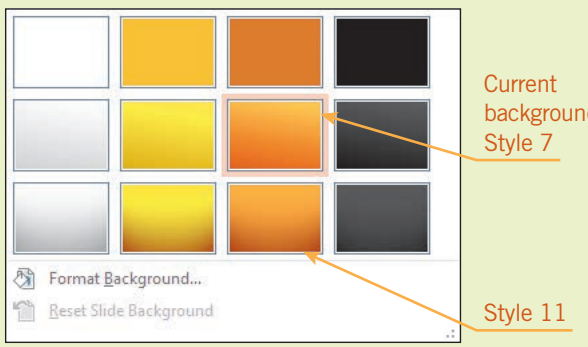
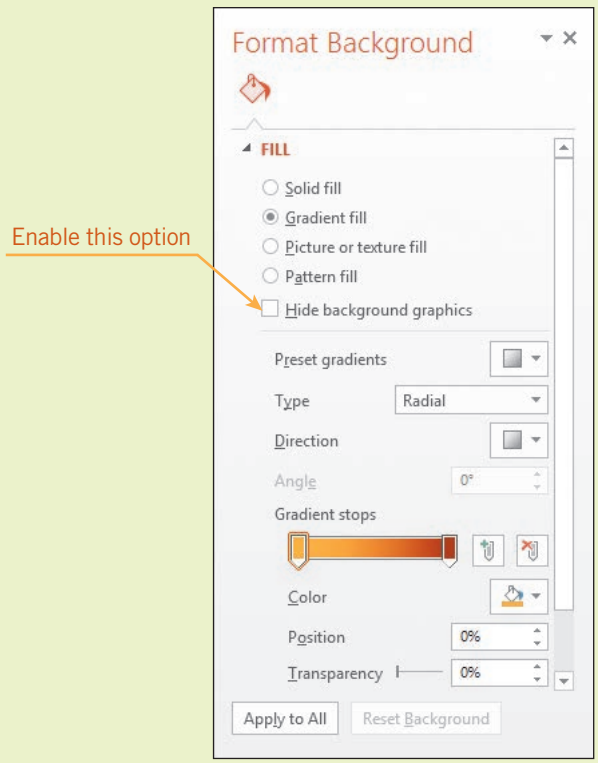


FIGURE 21–18
Background Styles gallery

9. The current background style for all the slides is the highlighted option. Position the mouse pointer over the highlighted style, and a ScreenTip will appear showing *Style 7*. Click **Style 11**. The new background style is applied to all the slides in the presentation.
10. Slide 1 is still the active slide. In the Customize group on the DESIGN tab, click the **Format Background** button. The Format Background pane shown in **Figure 21–19** opens.

FIGURE 21–19
Format Background pane



11. Enable the option **Hide background graphics**. The graphic is removed from the right side of the current active slide, but when you look at the thumbnails on the Slides tab, you can see the graphic is still on slide 2 and slide 3.
12. At the bottom of the Format Background pane, click **Apply to All**. The thumbnails on the Slides tab now show that the graphic was removed from all slides in the presentation. Close the Format Background pane.
13. On the Quick Access Toolbar, click the **Undo** button twice to restore the graphic on all slides.
14. On the Slides tab, click the **slide 3** thumbnail. Click the **HOME** tab, and then click the **New Slide** button to add a new slide with the same slide layout. The theme is applied to the new slide.
15. Save the changes, and leave the presentation open for the next Step-by-Step.

Editing Slides

As you work with a presentation, you will likely want to change the content of one or more of the slides. As you change the content of a slide, you may find you need to change the slide layout and the text formats. You also may want to add some universal elements to all the slides, such as a company name or logo. PowerPoint makes it easy for you to edit and manipulate the text and objects on a slide. If you accidentally delete contents, or if you change your mind, you can undo your edits. You can also redo an undo edit, and you can repeat previous actions.

When you add and edit text, the contents that are displayed on the Outline tab, the slides are automatically updated. You can also change the slide layout to accommodate the text you want to add. The content and formatting will remain intact; only the layout of the slide will change. You may find that if you select a layout that does not have placeholders for all the text and content in the original slide, elements of the slide may overlap. If so, you can move any placeholder and rearrange the elements of a slide.

When you use a theme, the format of the text on each of the slides is predetermined. There may be occasions, however, when you want to alter the text format. You may want to change the font style or point size. Changing the color of the text or changing the font style can add emphasis to the slide content, but be sure you choose the font styles carefully, because sometimes the font style can make it difficult to read text. Use Live Preview to see the formatting effects before you apply them.

Step-by-Step 21.7

IC3
2-1.1.6
2-1.1.9
2-1.2.1
2-1.2.2
2-1.3.6
2-1.4.1
2-4.3.1

1. If necessary, open the file **International 2** from your solution files. Save the International 2 presentation as **International 3**, followed by your initials.
2. On the Slides tab, click the **slide 3** thumbnail. Select all the text for the first bulleted item **Become a volunteer.**. Notice the boundaries of the placeholder, as indicated by the dashed line and the sizing handles, are selected. The placeholder is a text box, and all three bulleted items are in the text box.
3. Drag the **selected text** down and position the insertion point in front of the third bulleted item, then release the mouse button. The text *Become a volunteer.* is now the second bulleted item.
4. Click the **VIEW** tab, and then in the Presentation Views group, click the **Outline View** button. On the Outline tab, select all the text for the third bulleted item **Become a host family.**. Drag the **selected text** up and position the insertion point in front of the second item in the list. Click anywhere in the slide pane to deselect the text. The sequence should now be *Become an exchange student.*, *Become a host family.*, and *Become a volunteer.*.

QUICK TIP

Some placeholders for the text automatically format a bullet at the beginning of each paragraph. The bullet color and symbol are based on the theme. To remove the bullet, position the insertion point in the paragraph containing the bullet, and then, in the Paragraph group on the HOME tab, click the Bullets button to toggle off the automatic formatting.

5. On the Outline tab, select the text **exchange student**. On the Mini toolbar, click the **Font Color** button arrow. Under *Theme Colors*, click the **Dark Red, Accent 1, Lighter 40%** color (fourth row, fifth column). Although the new format is not displayed on the Outline tab, it is displayed in the slide pane. You are overriding the theme format.
6. On the Outline tab, select the text **host family**. On the Quick Access Toolbar, click the **Repeat** button. In the slide pane, select the text **volunteer**, and press **F4** to repeat the text color format edit.
7. In the slide pane, select the title **GET INVOLVED**. On the HOME tab, in the Drawing group (shown in **Figure 21–20**), click the **Quick Styles** button. Several styles that fit the theme colors are displayed. Move the mouse pointer over several styles to see the Live Preview. Then, click the style **Intense Effect - Dark Red, Accent 1** (bottom row, second column). Deselect the text to see the effects of the new style.

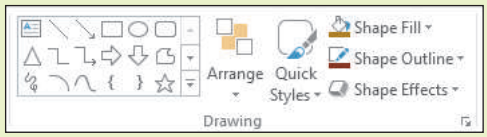


FIGURE 21–20
Drawing group on the HOME tab

8. Click anywhere in the bulleted list to show the placeholder boundaries. Point to the lower-right corner on the placeholder. When the pointer changes to a double-headed arrow, click and drag the **corner handle** up and to the left to resize the placeholder as shown in **Figure 21–21**. When you release the mouse button, the placeholder is significantly reduced in size and the font size changes so all the text still fits inside the placeholder.

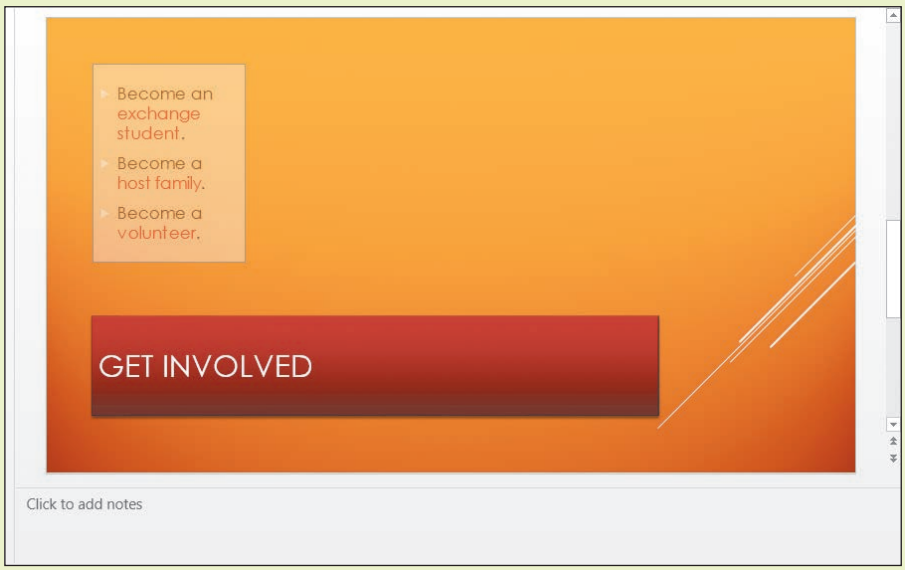


FIGURE 21–21
Resizing a placeholder

9. The placeholder should still be selected. Point to the lower-right corner and click and drag the **corner handle** down and to the right until the placeholder is aligned with the title placeholder. With the placeholder still selected, point to one of the placeholder borders. When the mouse pointer changes to a four-headed arrow, click and drag the **placeholder** and position it in the center of the slide.
10. Click the **Undo** button three times to restore the placeholder to its original location and size.
11. Select all the text for the three bulleted items. In the Paragraph group on the HOME tab, click the **Bullets** button arrow  , and then click the **Star Bullets** option. The round bullets are changed to star bullets. With the bulleted items still selected, change the font size to **28** pt.
12. In the Slides group on the HOME tab, click the **Layout** button. Note the layout options now also show the design for each slide layout. Click the **Two Content** layout. Now you can add text or an object, such as a picture, on the right side of the slide.
13. In the slide pane, select **Get Involved**, and use the Mini toolbar to apply the center alignment. Deselect the text.
14. Switch to **Normal** view. Save the changes, and leave the presentation open for the next Step-by-Step.

Working with Slide Masters

VOCABULARY
Slide Master

A Slide Master is added to your presentation when you apply a theme. A ***Slide Master*** is the main slide that stores information about the theme and layouts of the presentation. The information can include formatting, bullets, backgrounds, placeholder positions, and even graphics (such as a company logo). The Slide Master ensures consistency on each slide. When you update one or more of the elements, such as the company logo, you can make a universal change and the edits will be reflected on all the slides in the presentation. You can view the Slide Master in Slide Master view.

The text on the Slide Master is only for styling. To include a company name in a footer on all slides, you need to create the content for the footer in Normal view using the Header and Footer dialog box. To change the font style, size, and color of text in a footer, you can make the changes in the Slide Master.

Step-by-Step 21.8

2-1.2.1
2-1.3.6
2-1.4.1
2-4.1.1

1. If necessary, open the file **International 3** from your solution files. Save the International 3 presentation as **International 4**, followed by your initials.
2. On the Slides tab, click the **slide 2** thumbnail. Click the **VIEW** tab. In the Master Views group, shown in **Figure 21–22**, click the **Slide Master** button. The Slide Master, similar to **Figure 21–23**, opens in the slide pane. The Ribbon adapts to show options for the Slide Master.

FIGURE 21–22
Master Views group on the VIEW tab

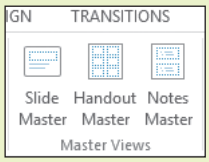
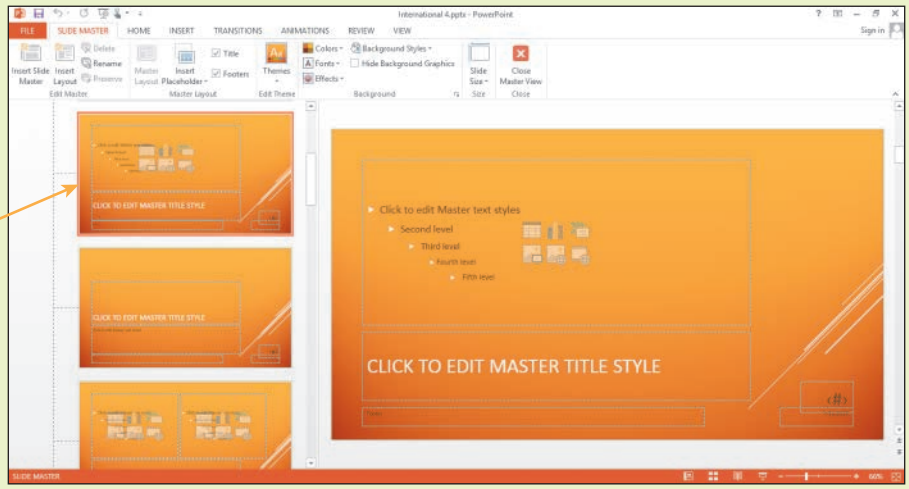


FIGURE 21–23
International 4 presentation in Slide Master view



3. Note that the Slides tab is no longer visible. Also, there are several new thumbnails at the left. The first thumbnail is the Slide Master for the presentation, and the thumbnails below the Slide Master are the supporting default slide layouts that are associated with the Slide Master.
4. At the top of the left pane, click the **Slide Master** thumbnail, as shown in Figure 21–23. Click the **INSERT** tab. In the Images group, shown in **Figure 21–24**, click the **Pictures** button. Navigate to the drive and folder where your Data Files folder is stored. Click the filename **Logo.jpg**, and then click **Insert**. The graphic (showing the letters INTL for International) is inserted on the Slide Master that is displayed in the slide pane.

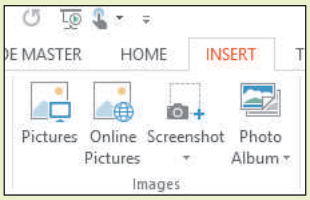


FIGURE 21–24
Images group on the INSERT tab

5. The graphic is already selected, so sizing handles are displayed on the graphic borders, as shown in **Figure 21–25**. Position the mouse pointer on one of the borders. When the mouse pointer changes to a four-headed arrow, click and drag the **graphic** and position it in the lower-right corner of the Slide Master, between the placeholders, as shown in Figure 21–25.

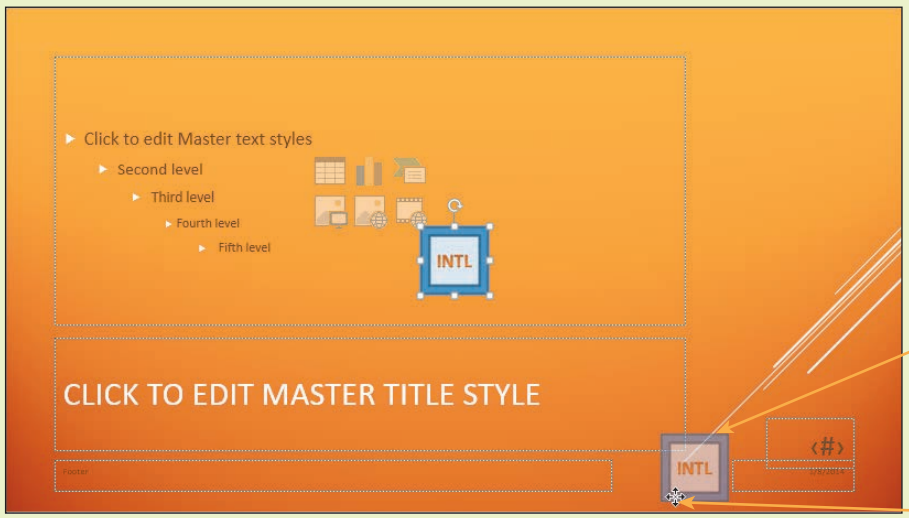


FIGURE 21–25
Repositioning graphic in slide pane

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6. When you release the mouse button, the logo is repositioned on the slide. Note that because the graphic was added to the Slide Master, the logo is displayed on all thumbnails in the left pane, except for the second thumbnail, which is the layout for the Title slide.
7. If necessary, click the **SLIDE MASTER** tab. In the Close group on the right side of the tab, click the **Close Master View** button. The presentation is displayed in Normal view again.

8. Click the **INSERT** tab. In the Text group shown in **Figure 21–26**, click the **Header & Footer** button. The Header and Footer dialog box shown in **Figure 21–27** opens.

FIGURE 21–26
Text group on the INSERT tab

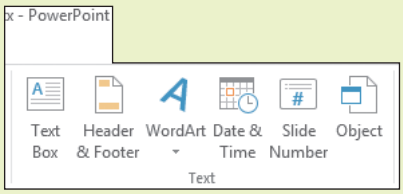
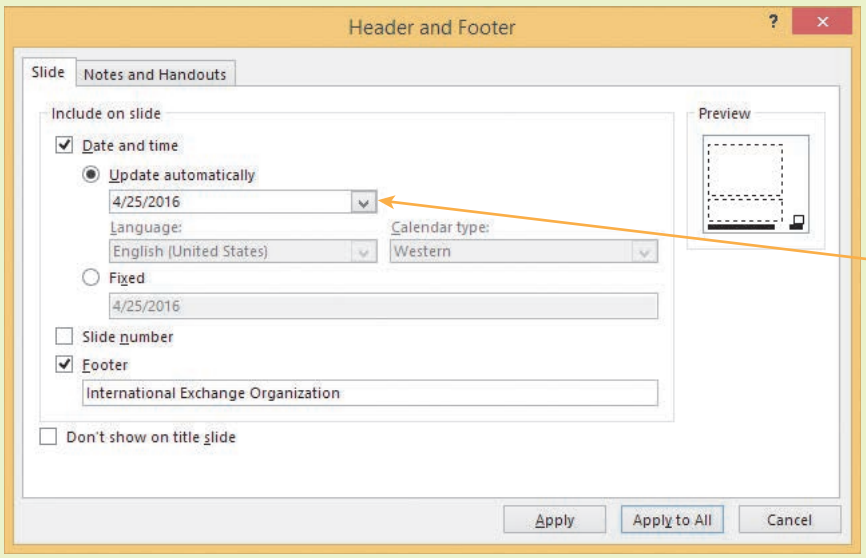


FIGURE 21–27
Header and Footer dialog box



9. Under *Include on slide*, click the **Date and time** check box, and if necessary click to enable the **Update automatically** option. Then click the **date format** list arrow, and if necessary select the **mm/dd/yyyy** format.
10. Click the **Footer** check box, and then in the text box type **International Exchange Organization**. The settings should match those shown in Figure 21–27, with the current date shown in the date format box.
11. At the bottom of the dialog box, click **Apply to All**. As you can see in the slide pane and in the thumbnails on the Slides tab, the footer with the date and organization name have been added to all three slides.
12. Click the **VIEW** tab and then in the Master Views group, click the **Slide Master** button. At the top of the left pane, click the **Slide Master** thumbnail.
13. In the slide pane, at the bottom of the slide, select the footer text **International Exchange Organization**. Change the font size to **20** pt and apply the **bold** format. Then select the **date** in the placeholder at the right and apply the same formats.
14. Click the **Close Master View** button. Save the changes, and leave the presentation open for the next Step-by-Step.

Previewing and Showing a Presentation

Now that you have had some practice creating and editing presentation slides, you probably want to see what the slides look like in Slide Show view. As you view the presentation, to advance to the next slide you can click the left mouse button, press Enter, or press the spacebar. You can also use the arrow keys or the Page Up and Page Down keys to navigate forward or backward.

You can click the Slide Show button on the VIEW tab, or you can click the SLIDE SHOW tab on the Ribbon for more options. In Slide Show view, when you move the mouse pointer around the lower-left corner of the screen, four buttons appear that help you navigate and add annotations to the slides while in Slide Show view. To add emphasis to the slide content, you can use the Annotation Pen to write directly on a slide, draw a picture, circle or underline words, and so on.

If you need to take a break or if you want your audience to focus on something other than the slides, you can temporarily stop the projection of the slide without exiting Slide Show view. To exit Slide Show view and return to Normal view, you can press Esc. If the last slide is the active slide, you can press the Page Down key or the down arrow key to return to Normal view.

Step-by-Step 21.9

IC3
2-1.1.1
2-1.3.6

1. If necessary, open the file **International 4** from your solution files.
2. Click the **SLIDE SHOW** tab. In the Start Slide Show group shown in **Figure 21–28**, click the **From Beginning** button. The first slide fills the screen. Move the mouse pointer across the screen. You can use the mouse pointer arrow to point out parts of the slide during your presentation. To navigate forward and backward through the slides:
   a. Click the left mouse button to advance to the next slide. Slide 2 fills the screen.
   b. Press **Page Up** to move to the previous slide.
   c. Press the **down arrow** to advance to the next slide.
   d. Press **Enter** to advance to the next slide.
   e. Press the **spacebar** to advance to the next slide.
   f. Press the **up arrow** twice to move up two slides in the presentation.

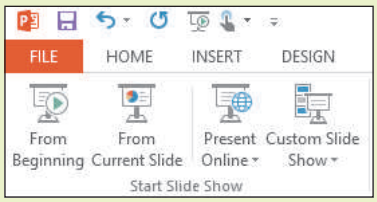


FIGURE 21–28
Start Slide Show group on the SLIDE SHOW tab

QUICK TIP

If your mouse includes a scroll wheel, you can use the wheel to navigate through the slides both forward and backward in Slide Show view.

3. Position the mouse pointer in the lower-left corner of the screen. As you drag the pointer over the bottom edge of the screen (which happens to be over the organization name in the footer), several slide show control buttons will appear as shown in **Figure 21–29**.

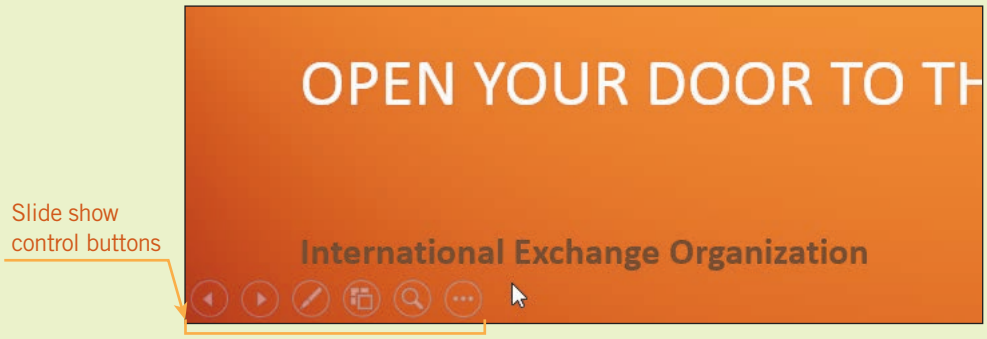


FIGURE 21–29
Slide show control buttons in Slide Show view

4. Click the **Previous Slide** button to move to the previous slide. Then click the **Next Slide** button to move to the next slide.
5. Click the **Pen Options Tool** button. In the color palette, select the **Green** color. (The mouse pointer is now a tiny green dot.)
6. Using the mouse, underline the word **important** and then circle the word **FUTURE**.
7. Click the **Pen Options Tool** button again, and then click **Highlighter**. Then click the **Pen Options Tool** button again and select the **Green** color. The pointer changes to show the highlight tip. Click and drag the mouse across the word *education*, just as you would highlight text on paper.
8. Click the **Pen Options Tool** button. In the menu, click **Pen**, and use the pen tool to underline the text *valued* on the screen. The pen marks overlay the text and objects that are displayed on the slide.
9. Move the mouse pointer down to the lower-left corner, and click the **Menu** button. In the menu, click **Screen**, and then in the submenu click **Hide Ink Markup** to hide the highlighted text and the underline. The pen tool is toggled off.
10. Right-click anywhere on the screen. In the menu that opens, click **See All Slides**. The slide show changes to a view that resembles Slide Sorter view, with the active slide selected. Click **slide 3** to show that slide.

QUICK TIP

You can also toggle off the Pen Options Tool by pressing Esc.

11. Press **B**, and the entire screen goes black. Press **B** again to toggle the black screen off. Press **W**, and the entire screen goes white. Press **W** again to toggle the white screen off.
12. Press **Esc** to return to Normal view. When prompted to keep your ink annotations, click **Discard**. Note that if you choose to keep the ink annotations, the highlight and underline would be saved in the presentation file and would appear in Slide Show view.
13. Leave the presentation open for the next Step-by-Step.

QUICK TIP

You can also toggle a white screen on and off by pressing W.

Hiding Slides and Customizing a Presentation

If your presentation time is cut, or if you are preparing to present to a different audience, you may need to skip some slides in your presentation. Instead of deleting the slides, you can hide some of the slides. You can hide a slide in Normal view or in Slide Sorter view by clicking the Hide Slide button in the Set Up group on the SLIDE SHOW tab. To restore a slide in the presentation, you can click the Slide Show button to toggle the feature off.

You can also create a custom slide show to skip slides in a presentation without deleting the slides. You can always run the original presentation.

Step-by-Step 21.10



IC3 2-1.1.3

1. If necessary, open the file **International 4** from your solution files. Save the International 4 presentation as **International 5**, followed by your initials.
2. To hide slide 2 so it is not displayed in Slide Show view, on the Slides tab, click the **slide 2** thumbnail. If necessary, click the **SLIDE SHOW** tab. In the Set Up group, click the **Hide Slide** button. A diagonal line is displayed on the slide number to indicate the Hide Slide option is enabled.
3. Switch to Slide Sorter view. Note that the slide 2 thumbnail is faded, indicating that it is hidden. To restore slide 2, click the **Hide Slide** button to toggle the feature off.
4. In the Start Slide Show group, click the **Custom Slide Show** button, and then click **Custom Shows**. The Custom Shows dialog box opens.
5. Click **New**. A list of all the slides in the presentation is displayed in the Define Custom Show dialog box.

QUICK TIP

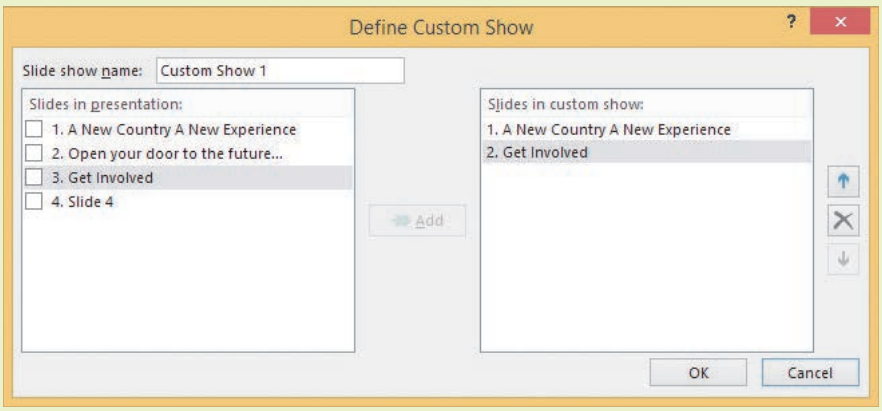
You can also hide or unhide a slide in Normal view or in Slide Sorter view using the shortcut menu. Right-click the slide thumbnail and then in the shortcut menu click Hide Slide.

QUICK TIP

To change the order of the slides, under Slides in custom show, select a slide. Then click either the up or down arrow to move the slide in the list.

6. In the Slide show name text box, leave the proposed slide show name *Custom Show 1* as is. Under *Slides in presentation*, click the **1. A New Country A New Experience** check box to select it. Click the **3. Get Involved** check box to select it as well.
7. Click **Add**. The selected slides are copied to the pane on the right and will be included in the new custom show. When your screen matches **Figure 21–30**, click **OK**.

FIGURE 21–30
Define Custom Show dialog box with selected slides



8. Close the Custom Shows dialog box.
9. In the Start Slide Show group, click the **Custom Slide Show** button, and then click **Custom Show 1**. The custom slide show opens.
10. Press **Page Down** twice to advance to the next slide and then to the end of the show. Then, press **Page Down** one more time to exit Slide Show view and return to Normal view.
11. Save the changes, and close the presentation.

TECHNOLOGY CAREERS

Career Communication Skills

Chances are that you have given some thought to the kind of career or job you want when you finish school. Are you interested in entering the corporate world, perhaps as an account manager in a marketing or advertising firm? Or maybe you have always wanted to teach in a classroom or train workers on the job. If you like science, you may be considering a career as a researcher for a large company or a university. In any of these careers, the individuals most likely to be promoted and succeed have something in common—they have good oral and written communication skills. The ability to make formal presentations is an increasingly important skill for many different occupations. In fact, communication skills can greatly enhance one's success in the classroom or on the job.

Many jobs require that an employee be able to organize, analyze, and communicate information. Moreover, employees are often called on to formally present information. For example, an account manager may use a presentation to pitch a new idea to a client. An instructor plans and presents material to other people every day. And a research scientist may be called on to report findings to colleagues, create a presentation on future projects for a grant application process, or even conduct a press conference to introduce a scientific breakthrough! The audience may be as small as one or two coworkers, or it may be a much larger group of people, and the presentation may be in person or on camera. In most cases, you will use some type of technology. To deliver an effective presentation, you must possess the technology skills and confidence to deliver an effective presentation.

SUMMARY



In this lesson, you learned:

- In addition to using the Slides and Outline tabs and Slide Sorter view to move to a different slide, you can use the scroll bar, mouse, or keyboard to navigate through a presentation in Normal view.
- You work in either Normal view or Slide Sorter view as you create and edit your presentation. You use Slide Show view when you present the show to an audience.
- You can use the Cut, Copy, and Paste commands to delete, move, or copy slides in a presentation. You can also easily rearrange the order of slides using drag-and-drop editing.
- To create an effective presentation, the design features for layouts and formats should emphasize the content without overwhelming it. For example, use the same fonts for the same features in all slides for a consistent appearance, and limit the number of special features on a single slide.
- The slide theme automatically formats slides with color schemes, font styles, and effects. A theme ensures that all slides in a presentation have a consistent look. You can apply a theme at any time without affecting the underlying content of the slides.
- You can change the slide layout even when the slide contains content, and you can modify the slide layout by resizing and repositioning the placeholders.
- You can add elements such as a company logo to the Slide Master so the elements appear consistently on all slides. You can create a footer to display a company name or date on one or all slides in the presentation.
- In Slide Show view, the slides are displayed full screen, and you can move through the presentation using the mouse or keyboard.
- You can add annotations to slides and highlight text when showing slides in Slide Show view.
- So that only designated slides are displayed in Slide Show view, you can hide slides or create a custom slide show.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. You can change the Zoom setting to change the magnification of the content on the screen.

T F 2. Once you apply a theme to a presentation, you cannot change the theme.

T F 3. When you apply a new background style, you must apply the new color to all the slides in the presentation.

T F 4. You can change the order of the slides by using drag-and-drop editing or by using the cut-and-paste method.

T F 5. If you do not use a placeholder, you must delete it or it will appear in Slide Show view or when the slide is printed.

T F 6. When you create a custom slide show, the slides you want to skip are deleted.

T F 7. As you type text in a placeholder, PowerPoint automatically checks for misspelled words and corrects common spelling errors.

T F 8. You can edit text in all views.

T F 9. As you type text in a placeholder, PowerPoint reduces the font size as needed so all the text fits inside the text box.

T F 10. The color options for a theme are limited to the four variants options.

MULTIPLE CHOICE

Select the best response for the following statements.

1. Use _____ to illustrate the steps in a process or data that should be examined in order.
   A. bulleted lists C. numbered lists
   B. annotations D. tables and charts
2. _____ view provides an overall picture of your presentation.
   A. Normal C. Slide Sorter
   B. Slide Show D. Reading
3. To add text to a slide or to manipulate the text on a slide, you must display the slide in _____ view.
   A. Normal C. Outline
   B. Slide Sorter D. A or C
4. The _____ stores the information about the theme and layouts of the presentation.
   A. Slide Master C. slide layout
   B. theme template D. none of the above
5. In _____ view, you can see how speaker's notes will appear when printed.
   A. Normal C. Reading
   B. Notes Pages D. B and C

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is the benefit of applying a theme?

2. What is the purpose of a Slide Master?

3. What is the purpose of the Notes pane?

4. Why is the font style important?

5. What is the purpose of adding annotations to a slide?

PROJECTS

PROJECT 21–1

2-1.2.1
2-1.3.2
2-1.3.3
2-1.3.6
2-4.1.1
2-4.2.1
2-4.3.1

1. Create a new blank presentation file. Save the presentation as **Unsung Heroes**, followed by your initials.
2. On the first slide, using the Title Slide layout, type the title **Recognition of Unsung Heroes**. Then type the subtitle **For Acts of Conscience and Courage**.
3. Insert a new slide with the Title and Content layout. Type **Definition of an Unsung Hero** in the title placeholder. Type **One who does great deeds**, in the content placeholder. Press **Enter** and type **unrecognized and unacknowledged** in the content placeholder.
4. In the slide pane, select the two bulleted items, and remove the bullets from the paragraphs.
5. Insert a new slide with the Two Content layout. Type **Characteristics of an Unsung Hero** in the title placeholder. Then in the content placeholders, type the following two lists. Keep the bullet formats.

Strength	**Selflessness**
Compassion	**Dedication**
Perseverance	**Integrity**

6. Switch to **Outline** view. On the Outline tab, at the bottom of the first bulleted list in slide 3, position the insertion point at the end of the word *Perseverance*. Press **Enter**, and type **Humility**. Then, using the Outline tab, add the word **Initiative** at the bottom of the second bulleted list.
7. Insert a new slide with the Title Only layout. Type **Applications for Nominations** in the title placeholder. Type **Be sure to have copies of application forms available.** in the Notes pane.
8. Apply an appropriate theme. If desired, modify font sizes to change how text wraps in the title placeholders and also enhance the readability of the text.
9. Save the changes, and close the presentation.

PROJECT 21–2

2-1.1.2
2-1.2.1
2-1.3.1
2-1.3.2
2-1.3.6
2-1.4.1
2-4.1.1
2-4.2.1
2-4.2.2
2-4.2.3
2-4.3.1

1. Open the file **International Students** from the drive and folder where your Data Files folder is stored. Save the Exchange Students presentation as **Revised International Students**, followed by your initials.
2. Switch to Slide Sorter view, and make the following changes:
   a. Select slides 1, 2 and 5, and then delete the selected slides.
   b. Move slide 2 to the end of the presentation.
   c. Move slide 3 so it is positioned before slide 2.
3. Switch to Normal view. Change the zoom setting for the Slides tab to **66%**, and, if necessary, fit the slide pane to the window.
4. Navigate to the first slide in the presentation. Insert a new slide with the **Title Slide** layout. Then reposition the new slide so it is the first slide in the presentation. Type **Exchange Students** in the title placeholder. Type **An International Education Opportunity** in the subtitle placeholder.
5. Resize the subtitle placeholder to decrease the width of the placeholder so the text wraps to four lines. Then reposition the subtitle placeholder to center it under the title on the slide.
6. Copy slide 6 and paste it after slide 1.
7. Apply a theme of your choice. Change the color scheme, background style, and theme fonts as desired. Make any desired modifications, such as text style, text alignment, text box placement, or font colors.
8. Save the changes to the presentation. Then preview each of the slides in the presentation in Reading view.
9. Switch to Slide Show view and navigate to slide 4. Toggle on the **Pen** option. Change the ink color to a color that will stand out in the slide design, and then use the pen to underline the word *Benefits*. Press **Esc** to toggle off the Pen tool.
10. Switch to Normal view, and keep the annotations.
11. Save the changes, and close the presentation.

PROJECT 21–3

2-1.2.1
2-1.3.1
2-1.3.2
2-1.3.6
2-4.1.1
2-4.2.1
2-4.2.3
2-4.3.1

1. Open the file **Search Tips** from the drive and folder where your Data Files folder is stored. Save the Search Tips presentation as **Revised Search Tips**, followed by your initials.
2. Change the slide 2 layout to the Title Only layout. Then insert a new blank slide after slide 2, using the same layout.
3. On the new slide 3, type **Then, choose a tool…** in the title placeholder. Then, using the Slides tab, move the new slide 3 to become the fourth slide.
4. Apply a design of your choice. Change the color scheme, background, and theme fonts as desired.
5. Add the footer **Internet Search Tips**. Apply the footer to all slides. (Depending on the theme, you may not want to include the footer on the title slide.) Adjust the font size for the footer text on the Slide Master.
6. Preview each slide in the presentation in Slide Show view using the mouse button and the Page Down key, the Page Up key, and the down arrow and up arrow keys. Then use the menu to navigate to slide 7. Exit Slide Show view.
7. Create a custom slide show, using the default slide show name. Include only slides 1, 2, 5, 6, 8, and 9. Preview each of the slides in the custom slide show, and then exit Slide Show view.
8. Save the changes, and then close the presentation.

TEAMWORK PROJECT

2-1.2.1
2-1.3.2
2-1.3.3
2-4.1.1
2-4.2.1
2-4.3.1

One of the best uses of a PowerPoint presentation is to persuade an audience to adopt a particular point of view. Follow these steps:

1. As a class, brainstorm some issues of interest to the entire class (such as a proposal for a new community park or bike path). Or, your instructor may have a list of issues already prepared.
2. Form groups of two learners who have different opinions on one topic. Each learner will create a slide show that presents their position.
3. Gather information on the issue from surveys or research, and then create a presentation to support your own particular point of view. Save the presentation as **TP 21–1**, followed by your initials.
4. Organize the slide content to emphasize your points clearly. Select a theme and slide layouts that present your information effectively.
5. Each team member will then present their argument, and classmates will critique each presentation for design, content, and persuasiveness.

CRITICAL THINKING

CRITICAL THINKING 21–1

2-1.2.1

One of the files you worked with in this lesson, 3Rs, addressed the importance of knowing the rules of copyright law for the Internet. If a classmate copies pictures from Web pages and uses the pictures in a report for a class assignment, is the classmate violating copyright laws? Search the Internet for information about copyright laws, and then do the following:

1. Create a new Word document, and save the document as **CT 21–1**, followed by your initials.
2. Explain why you think the classmate has or has not broken any copyright rules. Use the information gathered from your Internet search to support your argument. Be sure to respect those who provided the information at the Web site and give them credit by citing your sources!
3. Save the changes to the document.

CRITICAL THINKING 21–2

The slide layout and design are essential for emphasizing the presentation content. Through your own experience, you can probably relate to viewing an ineffective slide show. To avoid making similar mistakes, consider the guidelines you should follow when creating your own presentations.

1. Create a new Word document, and save the document as **CT 21–2**, followed by your initials.
2. Describe at least three design elements that are essential for developing an effective presentation.
3. Save the changes, and close the document.

ONLINE DISCOVERY

To complete this activity, you will need permission to access files online and download a file.

In the Word lessons, you learned about using templates to create documents. PowerPoint provides access to several templates to help you create professional-looking presentations. Not only do these presentation templates include preformatted designs, but some of them also include content that you can use as a guide as you create your own content. Some of these templates are provided by PowerPoint users like yourself.

1. In PowerPoint, click the **FILE** tab, and then click **New**. In the Search box at the top of the template gallery, type some key words such as *Academic presentations*, and then click the **Search** button to view available templates at Office.com. Or, you can click one of the links under the Search box.
2. Scroll through the thumbnails and select one of the templates that you think might be useful, and then click the thumbnail. A larger image of the thumbnail appears in the right pane, and customer ratings are provided above the image, which will help you decide if you want to download the template.
3. If permitted, click the **Create** button to download one of the templates and review the slides.
4. Review the slide contents and the theme used in the presentation.
5. Open a new Word document, and save the document as **OD 21–1**, followed by your initials. Write a brief paragraph about whether or not you think the template will be useful for future presentations, and explain why.
6. Save the changes, and close the document.

IC3 2-1.3.3

JOB SKILLS

In this lesson, you created several presentations. Choose one of your solution files (or another presentation file you have created), and review the content on each slide.

1. In Slide Show view, practice using the keyboard and mouse to navigate through the files.
2. Also practice using the pen tools.
3. Deliver the presentation in Slide Show view to your classmates. If there is not enough time to deliver the presentation to the class, ask a partner to watch the presentation.

IC3 2-1.1.1 2-1.3.6

EXPLORE AND SOLVE

In Presenter View, you can see the notes on your screen, below the slide, while the audience only sees the slide. When enabled, Presenter view automatically adapts to the projection set-up, and you can use the feature with only one monitor. Explore how Presenter View works and then use the feature as you deliver a presentation.

1. In this lesson, you created several presentations. Choose one of your solution files (or another presentation file you have created). Review the content on each slide, and then add notes to the Notes pane to help you prepare for the presentation.
2. Set up for projection.
3. Navigate through the slides in Slide Show view so you can see firsthand how the Presenter View feature works.

IC3 2-1.3.6



Estimated Time:
2 hours

LESSON 22

Enhancing Presentations with Multimedia Effects

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Add clip art, pictures from files, shapes and SmartArt graphics to a slide.
- Change the size and position of a graphic object, and add styles, borders, and shape fills to graphic objects on a slide.
- Create charts and tables using Excel and Word features.
- Create hyperlinks on slides to link to Web pages, e-mails, and other documents.
- Add slide transitions to control how the slides are introduced in a slide show.
- Animate objects on a slide to draw attention and add emphasis.
- Insert sound and video clips to add an extra dimension to a slide show.
- Prepare hard copies for handouts and speaker's notes, and distribute presentations via electronic copies.

WORDS TO KNOW

animation
emphasis effects
entrance effects
exit effects
motion paths
slide transitions
trigger

DATA FILES

To complete this lesson, you will need these data files:

Clock.jpg	Hourglass.jpg	Resort.pptx
Dog Bark.wav	Productivity.pptx	Scenic View.jpg
Dog Video.mp4	Recycle Bucket.jpg	Time Management.pptx
Glade Birds.wav	Recycle Video.mp4	Waste Report.pptx
Horseback.jpg	Rescued Pets.pptx	

Microsoft product screenshots used with permission from Microsoft Corporation.

A good presentation holds your audience's attention without distracting them from comprehending the information you are presenting. PowerPoint allows you to use colors, designs, graphics, links, sound, and video to illustrate your information effectively by emphasizing and clarifying your points.

Inserting and Formatting Graphics

Graphics can help your audience remember your message. Graphics include shapes, clip art, pictures, WordArt, SmartArt graphics, tables, and charts. PowerPoint provides special content placeholders in slide layouts to make the task of adding graphics easy. But do not let your message get lost by overloading your slide show with the abundant special effects available. Use graphics only when they illustrate relevant points in a presentation.

Adding Pictures to a Slide

If you have an Internet connection open, you can insert clip art and photographs from a gallery of clip art files that Microsoft provides at Office.com. This is called inserting an online picture. There are also other Internet sources for clip art and photographs.

Another option is to insert a picture from a file, such as a digital photograph or a scanned image of a drawing. You can access pictures that you have saved on your computer or on SkyDrive, and you can also connect to Facebook, Flickr, and other sites to get your pictures.

The content placeholders simplify the task for inserting graphics. When you insert a graphic using a graphic button in a placeholder, the graphic replaces the placeholder, and the graphic will not exceed the height or width of the placeholder. When a graphic is selected, eight small squares and circles called sizing handles appear on the border of the graphic. When the graphic is selected, you can cut, copy, paste, delete, move, or resize it. To resize the graphic, drag a sizing handle and you will see the effect on the screen as you drag. To resize the graphic proportionally, drag a corner sizing handle. To remove portions of a graphic, you use the Crop command.

Step-by-Step 22.1

IC3
2-1.3.5
2-1.4.1
2-1.4.2
2-4.1.5

1. Start **PowerPoint**, and open the file **Time Management** from the drive and folder where your Data Files folder is stored. Save the Time Management presentation as **Revised Time Management 1**, followed by your initials.
2. Go to slide 3, a slide with the Two Content slide layout. Each of the content placeholders shows six different graphics buttons, as shown in **Figure 22–1**. Point to each of the *graphics* buttons to show the ScreenTips with the button names.

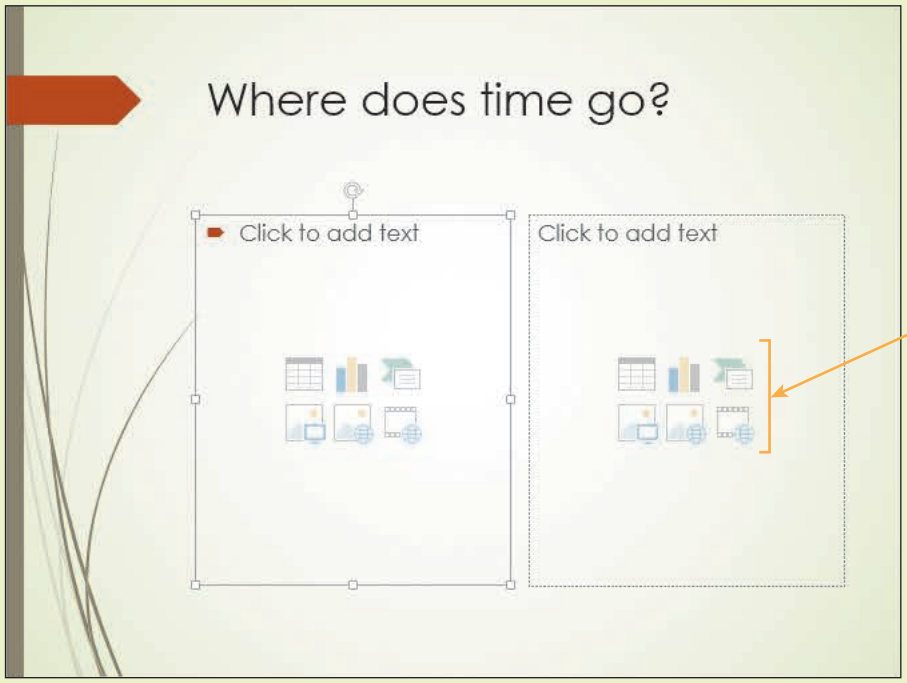


FIGURE 22–1
Graphics buttons in Title and Content layout placeholders

3. In the content placeholder on the left, click the **Online Pictures** button. The Insert Pictures dialog box, similar to the one shown in **Figure 22–2**, opens. Note that there are options for searching for Office.com Clip Art and for using Bing to search the Web for images. If you have a SkyDrive account, you will also see an option to browse for images stored in your SkyDrive account.

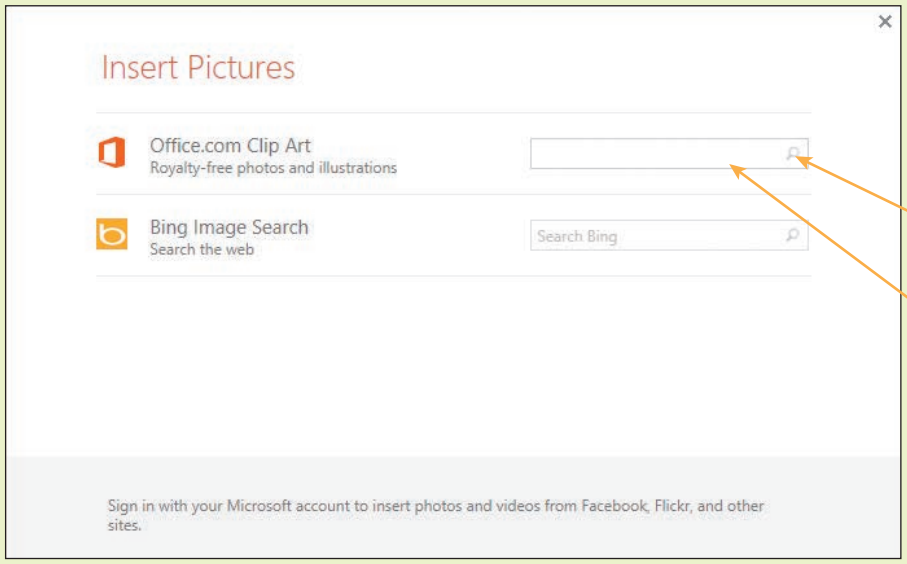


FIGURE 22–2
Insert Pictures dialog box

4. Do one of the following:
   a. If you have an Internet connection, go to Step 5.
   b. If you do not have an Internet connection, close the Insert Pictures dialog box and go to Step 7.
5. The insertion point is positioned in the *Office.com Clip Art* search box. Type **clock** and then click the **Search** button (or press **Enter**). Hundreds of photos and illustrations that match the search text will display, similar to those shown in **Figure 22–3**. Scroll through the thumbnails to review some of the results.



FIGURE 22–3
Online picture search results from Office.com Clip Art gallery

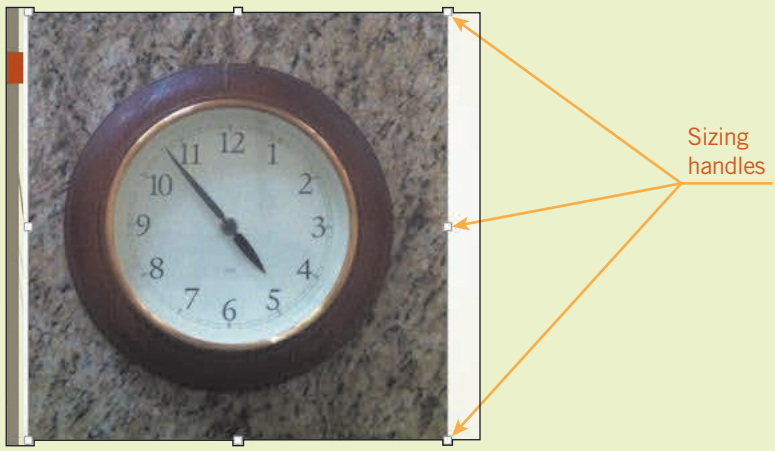
6. To download one or more of these pictures, you would select the thumbnail and then click the Insert button in the dialog box. Instead, click **Cancel** to close the search results. Then, close the Insert Pictures dialog box.
7. In the content placeholder on the left, click the **Pictures** button. The Insert Picture dialog box opens. Navigate to the drive and folder where your Data Files folder is stored. Select the file **Hourglass.jpg**, and then click the **Insert** button in the dialog box. The picture replaces the content placeholder, as shown in **Figure 22–4**. Note that the picture height is the same height as the content placeholder on the right.



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FIGURE 22–4
Hourglass picture replaces placeholder

8. In the content placeholder on the right, click above the graphics buttons. Type **Time lost is never found.** in the placeholder. The text is contained in a text box and formatted with a bullet. Right-click the line of **text**. In the shortcut menu, click **Bullets** to remove the bullet format.
9. Go to slide 2, a blank slide with no content placeholders. Click the **VIEW** tab. In the Show group, if necessary, enable the **Ruler** option.
10. Click the **INSERT** tab. In the Images group, click the **Pictures** button to open the Insert Picture dialog box. Click the file **Clock.jpg**, and then click **Insert**. The picture fills the slide area from top to bottom. Note that the PICTURE TOOLS FORMAT tab displays and eight sizing handles appear around the picture, as shown in **Figure 22–5**.

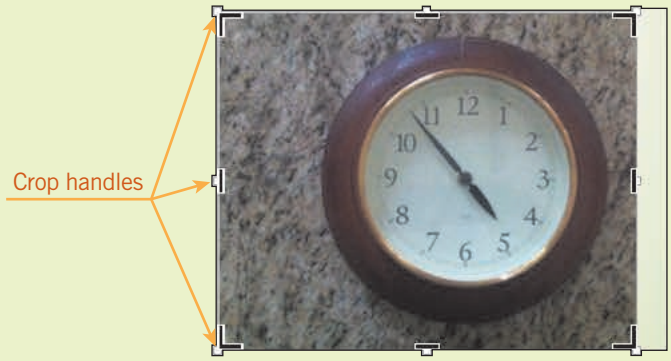


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FIGURE 22–5
Selected picture with sizing handles

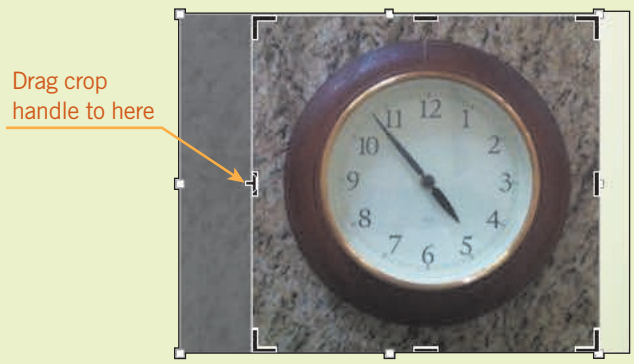
11. Point to the *sizing handle* in the upper-left corner. When the pointer changes to a double-headed arrow, drag the **sizing handle** to the center of the picture to reduce the size of the picture about 50%.
12. The picture should still be selected. To crop the picture:
    a. In the Size group on the PICTURE TOOLS FORMAT tab, click the **Crop** button. The sizing handles change in appearance, as shown in **Figure 22–6**.
    b. Point to the *middle cropping handle* on the left border, and drag the **left border** to the right until the background of the image is balanced as shown in **Figure 22–7**, and then release the mouse button.
    c. Click the **Crop** button. The portion of the picture you cropped is gone.

FIGURE 22–6
Selected picture with cropping handles



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FIGURE 22–7
Cropping lines



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13. In the Size group, change the height to **5"**.
14. Position the mouse pointer anywhere within the picture. When the pointer changes to a four-headed arrow, click and drag the **picture** to reposition it in the center of the slide.
15. Save the changes, and leave the presentation open for the next Step-by-Step.

Adding WordArt, Shapes, and SmartArt Graphics to a Slide

You can also create WordArt objects and draw objects on a slide using the same drawing tools that you learned to use in Word. You can resize and reposition text boxes and shapes. SmartArt graphics enable you to convert text to a professional-looking visual element. As you already know, SmartArt graphics provide a professional look and are easy to create. Applying styles, fill colors, borders, and effects to the objects will also add emphasis and create a professional look.

Step-by-Step 22.2

IC3
2-1.2.1
2-1.4.1
2-1.4.2
2-4.1.5

1. If necessary, open the file **Revised Time Management 1** from your solution files. Save the Revised Time Management 1 presentation as **Revised Time Management 2**, followed by your initials. If necessary, go to Slide 2.
2. Click the **INSERT** tab. In the Text group, click the **WordArt** button. In the WordArt gallery shown in **Figure 22–8**, click the **Fill – Brown, Accent 3, Sharp Bevel** style (second row, fifth column). A text box displays on top of the picture. Type **Racing the Clock** in the WordArt text box.

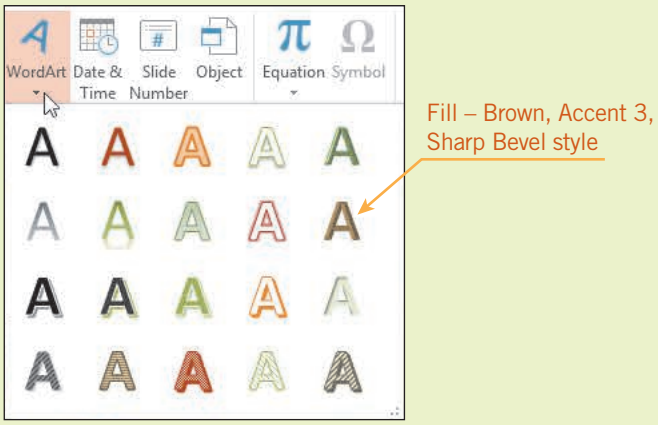


FIGURE 22–8
WordArt gallery

3. Point to one of the WordArt text box borders. When the pointer changes to a four-headed arrow, click and drag the **text box** to the top of the slide and position the text box above the picture.

4. Go to slide 4, a slide with the Title and Content slide layout. The HOME tab is the active tab. In the Drawing group, click the **More** button for the Shapes box. In the Shapes gallery, under *Basic Shapes*, click the **Smiley Face** shape tool (third row, sixth column) shown in **Figure 22–9**. The mouse pointer changes to a crosshair +.

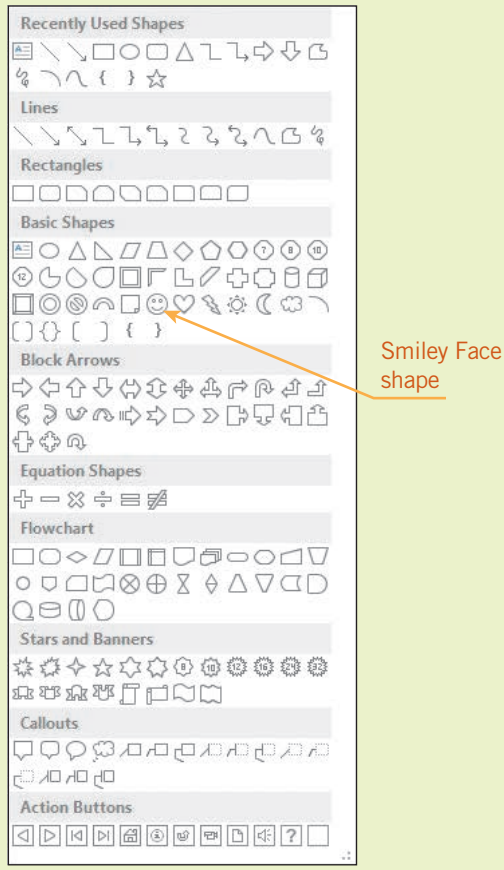


FIGURE 22–9
Shapes gallery

5. Position the mouse pointer slightly above and to the left of the *graphics* buttons, and then click and drag the mouse pointer diagonally down and to the right to create a smiley face object that covers all the graphics buttons. The object overlays the content placeholder.
6. The smiley face object should still be selected. Click the **DRAWING TOOLS FORMAT** tab. In the Shape Styles group, click the **More** button. In the Shape Styles gallery shown in **Figure 22–10**, click the **Colored Outline – Dark Red, Accent 1** style (first row, second column). In the Shape Styles group, click the **Shape Fill** button arrow, and under *Standard Colors*, click the color **Yellow**.



FIGURE 22–10
Shape Styles gallery

7. To change the smile to a frown, point to the *square handle* on the smile and click and drag the **line** upward. When you start to drag the square handle, the mouse pointer will change to a triangle, as shown in **Figure 22–11**. After modifying the shape, click outside the face to deselect the object.

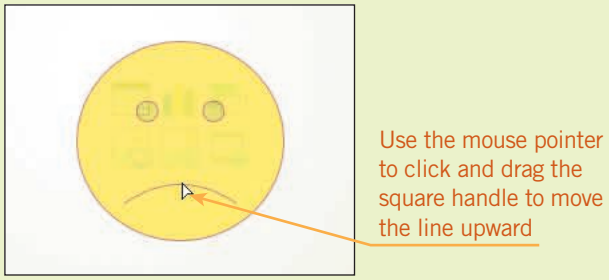
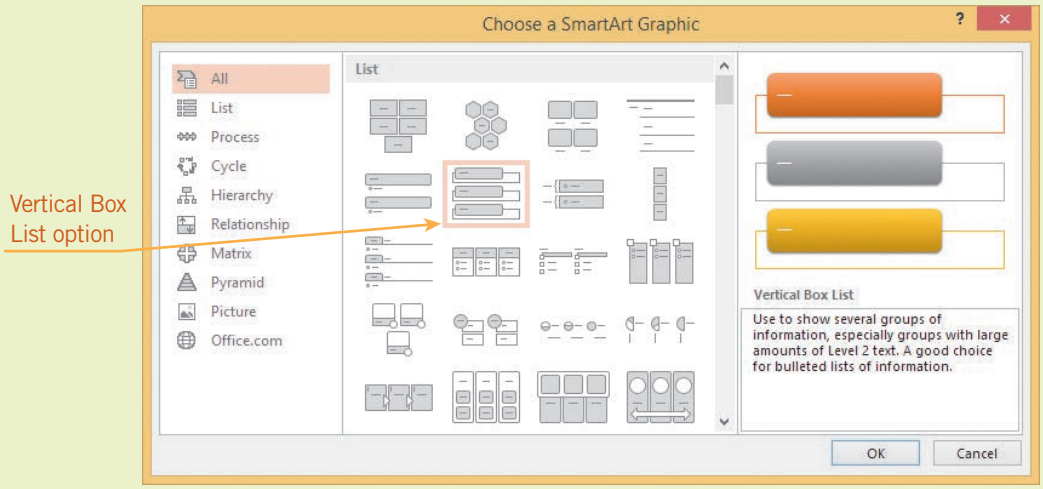


FIGURE 22–11
Changing the smile on the smiley face

8. To select the placeholder, click a **border line**. The placeholder is selected when the eight sizing handles display and the border lines are solid. Press **Delete** to remove the placeholder. The smiley face remains unchanged.

9. Go to slide 5. In the content placeholder, click the **Insert SmartArt Graphic** button. The Choose a SmartArt Graphic dialog box shown in **Figure 22–12** opens. In the middle pane, under *List*, click the option, **Vertical Box List** (second row, second column). Then click **OK**.

FIGURE 22–12
Insert SmartArt Graphic dialog box



10. Type the following in the SmartArt text boxes:

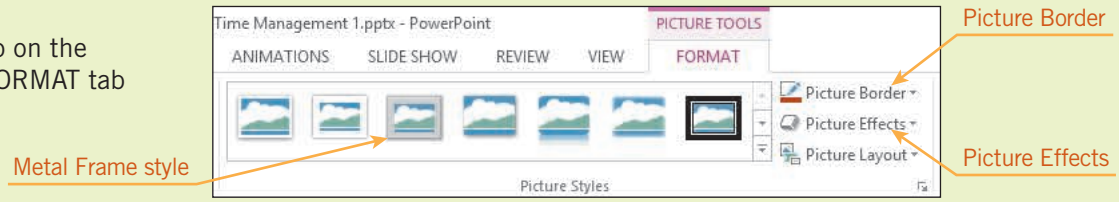
Pay utilities due Thursday

Summary report due Friday

Schedule appt. w/A. Jones

11. Go to slide 3. Select the **Hourglass** picture. Click the **PICTURE TOOLS FORMAT** tab. In the Picture Styles group, shown in **Figure 22–13**, click the **Metal Frame** picture style. In the Picture Styles group, click the **Picture Border** button. In the color palette, under *Theme Colors*, click the **Olive Green, Accent 4, Lighter 40%** color (fourth row, eighth column).

FIGURE 22–13
Picture Styles group on the PICTURE TOOLS FORMAT tab



12. Go to slide 2. Select the **Clock** picture. In the Picture Styles group, click the **Picture Effects** button. In the menu, click **Preset**. In the submenu shown in **Figure 22–14**, under *Presets*, click the **Preset 4** option. The preset effect is applied.

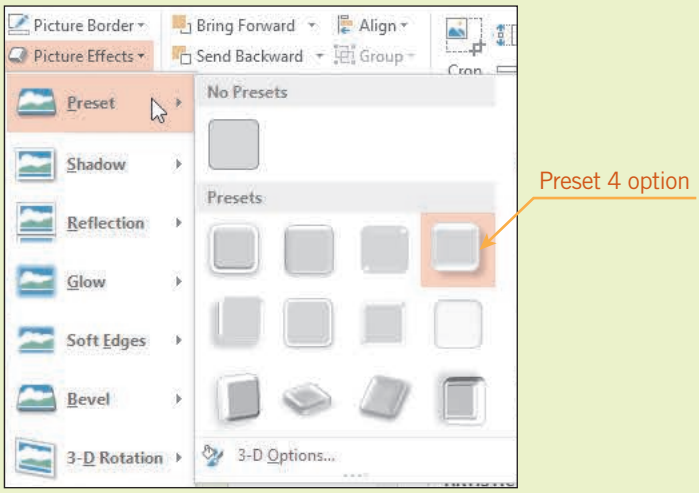


FIGURE 22–14
Preset submenu

13. The picture should still be selected. In the Picture Styles group, click the **Picture Border** button. In the color palette, under *Theme Colors*, click the **Brown, Accent 3, Darker 50%** color (sixth row, seventh column). Click the **Picture Border** button again, click **Weight**, and then click **6 pt**.
14. Deselect the picture. Save the changes and close the presentation. Leave PowerPoint open for the next Step-by-Step.

Adding Tables, Charts, and Text Boxes to Slides

You can add tables and simple charts to illustrate numerical data or trends. The placeholders make it easy to create a table or chart on a slide using features in Word and Excel with which you are already familiar.

If you have used all the placeholders on the slide and you want to add additional text to a slide, you can insert a text box. Adding styles, borders, and shape fills to text boxes can add emphasis to the text. PowerPoint provides several predefined styles, or you can choose your own text box fill colors, borders, and effects.

Step-by-Step 22.3

2-1.2.1
2-1.2.2
2-4.1.1
2-4.1.2
2-4.1.4
2-4.1.5

1. Open the file **Rescued Pets** from the drive and folder where your Data Files folder is stored. Save the Rescued Pets presentation as **Revised Rescued Pets 1**, followed by your initials.
2. Go to slide 4. In the content placeholder, click the **Insert Table** button. The Insert Table dialog box opens. Change the settings to **4** columns and **6** rows. Click **OK**. A table is inserted on the slide. Enter the table data shown in **Figure 22–15**.

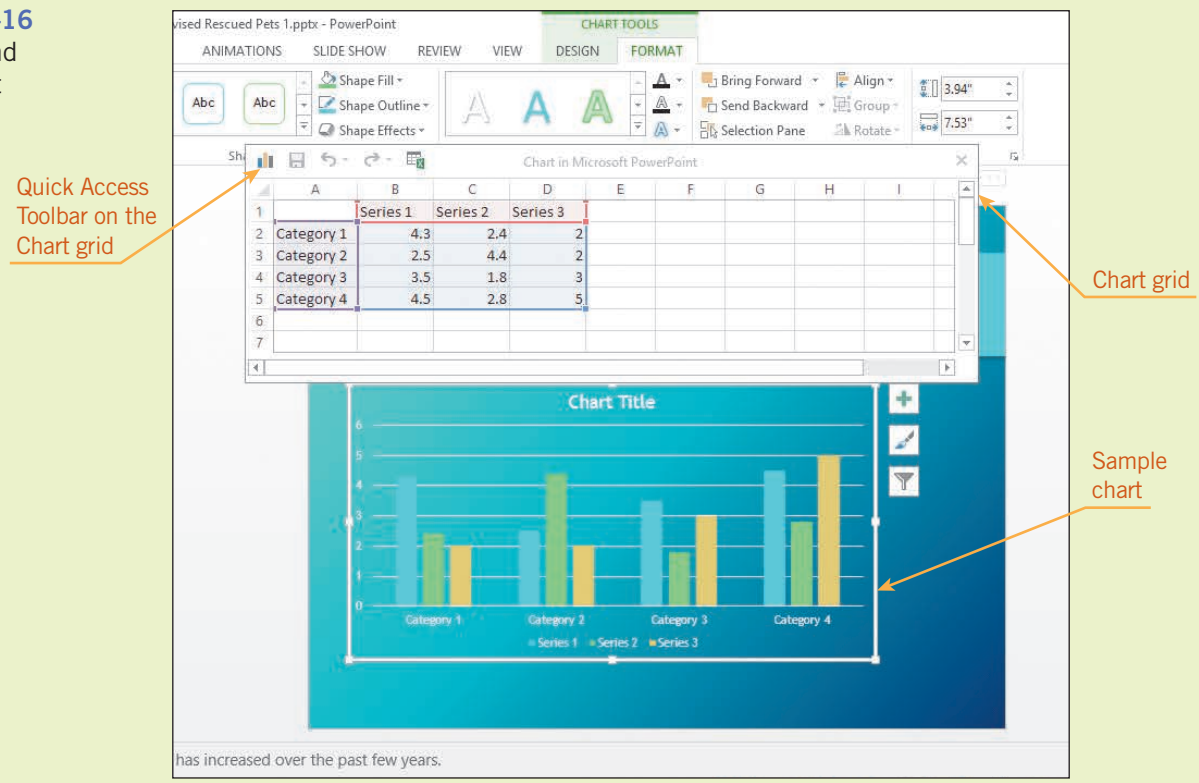
FIGURE 22–15
Table data for slide 3

Name	Gender	Age	Breed
Sebastian	Male	Young	Beagle
Bailey	Female	Adult	Mix
Snickers	Female	Baby	Shih Tzu
Marshall	Male	Young	Pug
Max	Male	Adult	Yorkshire Terrier

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3. Select all the cells in the *Breed* column. Click the **TABLE TOOLS LAYOUT** tab. In the Cell Size group, change the setting in the *Width* box to **2.1"**.
4. Go to slide 3. In the content placeholder, click the **Insert Chart** button. The Insert Chart dialog box opens. The first option, *Clustered Column*, should already be selected. Click **OK**. A chart grid opens, as shown in **Figure 22–16**. The worksheet contains sample data, and a sample chart is inserted on the PowerPoint slide.

FIGURE 22–16
Chart grid and sample chart



5. On the Quick Access Toolbar in the chart grid, click the **Edit Data in Microsoft Excel** button. The Excel application window opens. In the Excel application window, point to the lower-right corner of cell *D5*. When the pointer changes to a double-headed arrow, drag the **cell corner** down to cell *D6* to add one more row to the data range. The data range is now *A1:D6*. In the worksheet, replace the sample data with the data shown in **Figure 22–17**. As you enter the data, the chart in the slide in the PowerPoint application window is updated.

	A	B	C	D	E
1		Baby	Young	Adult	
2	2011	45	41	31	
3	2012	52	48	35	
4	2013	61	62	39	
5	2014	79	69	42	
6	2015	86	75	44	
7					

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FIGURE 22–17
Chart data for slide 3

6. In the Excel application window, click the **FILE** tab, and then click **Save As**. Navigate to the drive and folder where your solution files are saved. Save the worksheet as **Pet Data**, followed by your initials. Then close the Excel application. The PowerPoint application is still open, and the updated chart is shown on slide 3.

QUICK TIP

You can also copy and paste tables and charts from Word and Excel documents.

7. Go to slide 4. Click the **INSERT** tab. In the Text group, click the **Text Box** button. The mouse pointer changes to a crosshair. Drag the mouse pointer below the table to create a text box the width of the first two table columns. The insertion point is positioned in the new text box. Type **This list changes daily.** in the text box.
8. Position the mouse pointer over the *middle sizing* handle on the right text box border. When the pointer changes to a double-headed arrow, drag the **right border** to the left as shown in **Figure 22–18** to decrease the width of the text box.

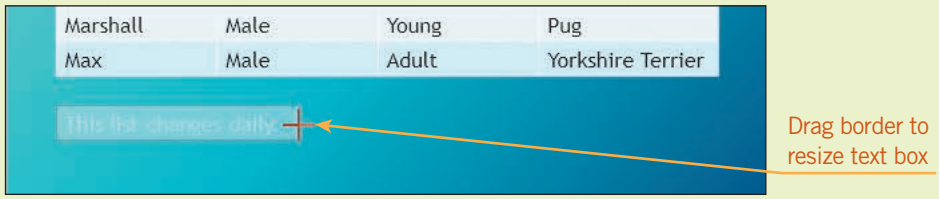
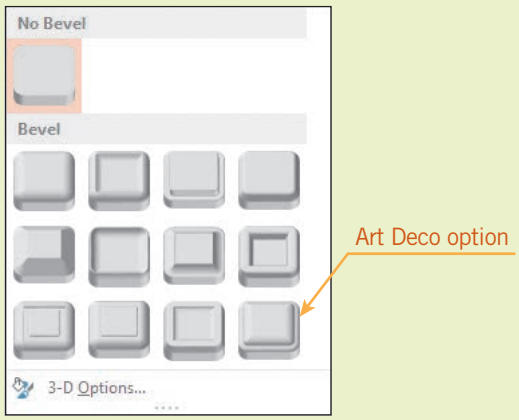


FIGURE 22–18
Adjusting the size of the text box

9. Point to one of the *text box* borders. When the pointer changes to a four-headed arrow, drag the **text box** to center it below the table.
10. The text box should still be selected. In the Drawing group on the HOME tab, click the **Quick Styles** button. In the Quick Styles gallery, click the **Colored Outline – Black, Dark 1** style (first row, first column).

11. Go to slide 5. Click anywhere in the text box below the slide title. Drag the middle sizing handle on the left border to the right to decrease the width of the text box to fit the width of the text. Then drag the **middle sizing handle** on the bottom border up to decrease the height of the text box to fit the height of the text.
12. Click the **DRAWING TOOLS FORMAT** tab. In the Shape Styles group, click the **Shape Fill** button. Under *Theme Colors*, click the **Turquoise, Accent 1** color (first row, fifth column). Then click the **Shape Effects** button and then click **Bevel**. In the submenu shown in **Figure 22–19**, under *Bevel*, click the **Art Deco** option (third row, fourth column).

FIGURE 22–19
Bevel submenu



QUICK TIP

If the Mini toolbar does not display, deselect the text and select the text again, keeping the mouse pointer near the selection.

13. Click anywhere inside the **text box**. Then select all the text in the text box. Using the Mini toolbar, change the font color to **Black, Background 1** (under *Theme Colors*, first row, first column). Deselect the text.
14. Save the changes, and leave the presentation open for the next Step-by-Step.

Creating Hyperlinks

In PowerPoint, you can create hyperlinks to slides in the same presentation, to slides in another presentation, or to an e-mail address, a Web page, or another file. You can create the hyperlink from text on a slide, and you can also create the hyperlink from a graphic object on a slide. Hyperlink formats, such as font colors before and after a followed link, are based on the presentation theme.

Hyperlinks are only functional in Slide Show view, and you can customize the ScreenTip that appears when you position the mouse pointer over the hyperlink text or object while in Slide Show view.

Step-by-Step 22.4

2-1.1.7

1. If necessary, open the file **Revised Rescued Pets 1** from your solution files. Save the Revised Rescued Pets 1 presentation as **Revised Rescued Pets 2**, followed by your initials. If necessary, go to slide 5.
2. In the text box, select the text **www.clintonrescue.org**. Click the **INSERT** tab. In the Links group, click the **Hyperlink** button.
3. The Insert Hyperlink dialog box, similar to the one shown in **Figure 22–20**, opens. The option *Existing File or Web Page* is already selected, and the selected text is displayed in the *Text to display* box at the top of the dialog box.

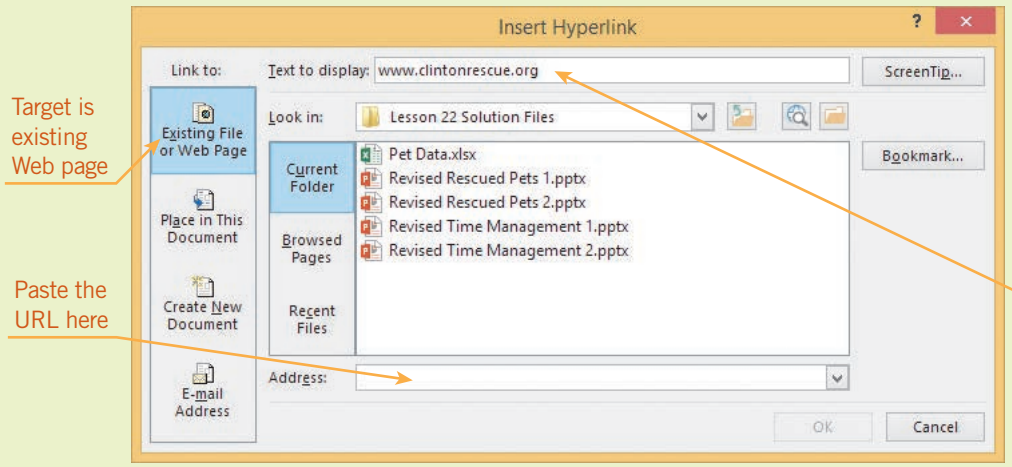


FIGURE 22–20
Insert Hyperlink dialog box

4. In the *Text to display* box, select the text **www.clintonrescue.org**. Right-click the **selected text** and then in the shortcut menu click **Copy**. Right-click the **Address** box and in the shortcut menu click **Paste**.
5. In the upper-right corner of the dialog box, click **ScreenTip**. The Set Hyperlink ScreenTip dialog box opens. In the ScreenTip text box, type **Visit our Web site**, and then click **OK** twice to close the dialog boxes. Deselect the text. The linked text is automatically formatted in a different color with an underline to designate the hyperlink, but the font color does not complement the shape fill color.

6. Click the **DESIGN** tab. In the Variants group, click the **More** button and then click **Colors**. At the bottom of the gallery, click **Customize Colors**. The Create New Theme Colors dialog box shown in **Figure 22–21** opens.

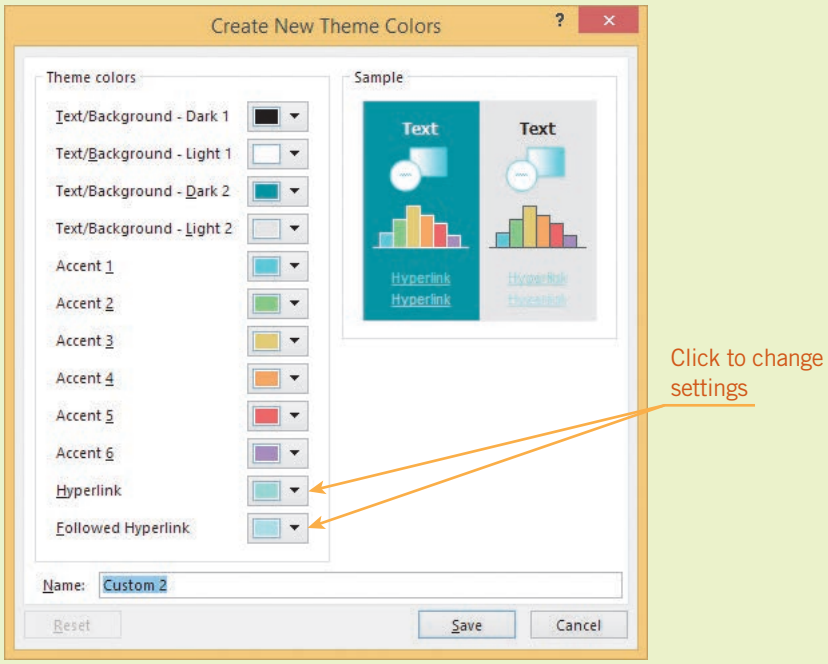


FIGURE 22–21
Create New Theme Colors dialog box

7. Click the **Hyperlink** button arrow. Under *Theme colors*, click **White, Text 1** (first row, second column). Click the **Followed Hyperlink** button. Under *Theme colors*, click the **Turquoise, Background 2** color (first row, third column). Then click **Save** to save the settings and close the dialog box.

8. Go to slide 3. Click anywhere in the **chart** to select it. Click the **INSERT** tab, and then in the Links group click the **Hyperlink** button to open the Insert Hyperlink dialog box. If necessary, click the **Look in** list arrow to navigate to the folder where you saved the Pet Data file. Click the file **Pet Data.xlsx**, and then click **OK**. A link to the Excel file is created, but unlike the linked text, no format appears to designate the hyperlink. The link will help you quickly access the worksheet if you need to update the data.

9. Go to slide 2. Click the **picture** on the left to select it, and then click the **Hyperlink** button. In the Insert Hyperlink dialog box, under *Link to*, click **Place in This Document**. A list of the slides with the slide titles is displayed, as shown in **Figure 22–22**.

QUICK TIP

To edit chart data, you do not have to open the Excel worksheet. Right-click the chart on the slide and in the shortcut menu, click Edit Data. The chart grid will display and you can edit the data in the chart grid.

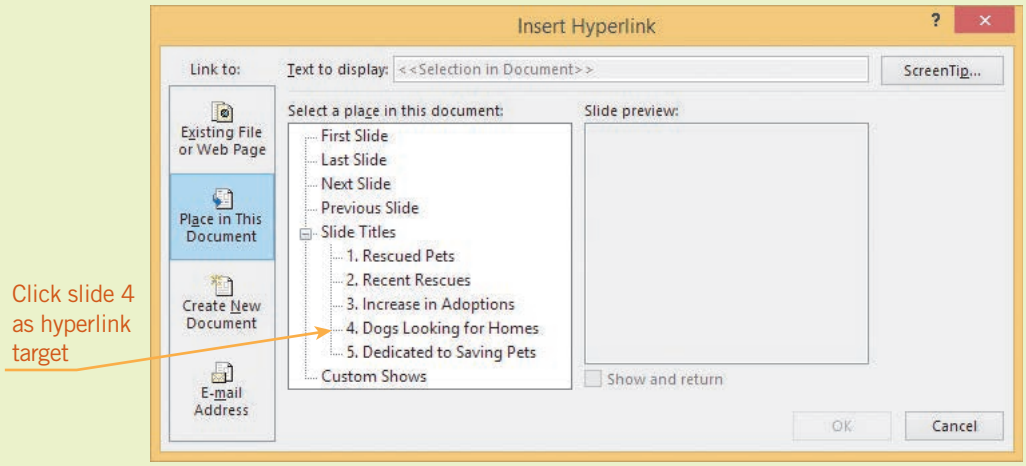


FIGURE 22–22
Options for hyperlinks to place in this document

10. Click **4. Dogs Looking for Homes**. The selected slide is displayed in the Slide preview pane. Click **OK**. A link has been created to the picture on slide 2, but unlike linked text, no format appears to designate the hyperlink.
11. Go to slide 3. In the status bar, click the **Slide Show** view button to switch to Slide Show view so you can test the hyperlinks. Slide 4 is displayed in full screen view. Position the mouse pointer over the *chart*, and the pointer changes to a hand, indicating a hyperlink. A ScreenTip with the path for the linked file also appears.
12. Click anywhere in the **chart** and the linked worksheet opens in the Excel application window. Close Excel.
13. Press **Page Up** to move to the previous slide. Position the mouse pointer over the *picture* on the left. When the pointer changes to a hand, click. Slide 4 is displayed.
14. Press **End** to move to the last slide in the presentation. Position the mouse pointer over the *URL*. The customized text *Visit our Web site* is displayed in the ScreenTip. (Do not click the hyperlink.)
15. Press **Esc** to return to Normal view in PowerPoint. Save the changes, and leave the presentation open for the next Step-by-Step.

Formatting Slide Transitions

Slide transitions are settings that control how a slide is introduced as you move from one slide to another in Slide Show view. For example, you can format the transition so the current slide fades to black before the next slide is displayed. Or you can choose to have the next slide automatically appear after a designated number of seconds. You can even choose a sound effect that plays as the transition occurs. When used effectively, the transitions you add between the slides add interest and help keep the attention of your audience focused on the presentation. You can apply the transition settings to a single slide or to all the slides in the presentation.

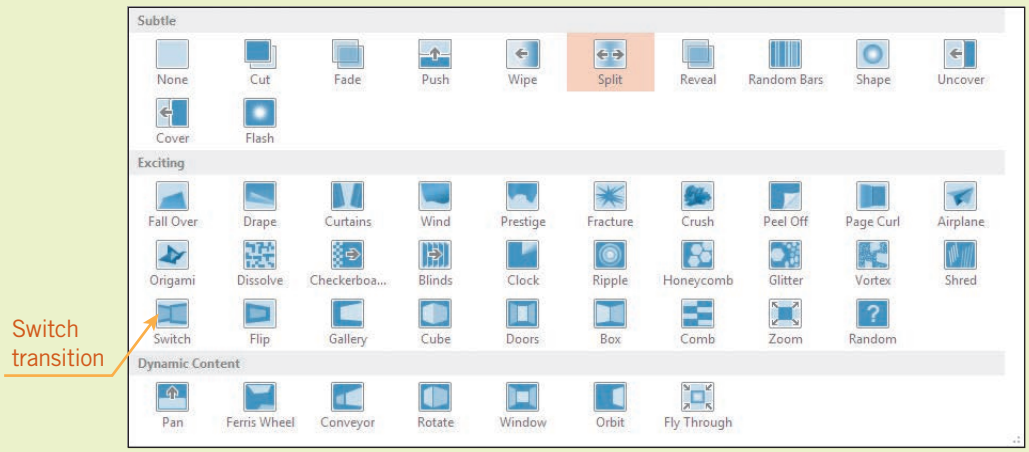
VOCABULARY
slide transitions

Step-by-Step 22.5

2-4.1.3
2-4.3.3

1. If necessary, open the file **Revised Rescued Pets 2** from your solution files. Save the Revised Rescued Pets 2 presentation as **Revised Rescued Pets 3**, followed by your initials.
2. Go to slide 2. Click the **TRANSITIONS** tab to display the transition options. In the Transition to This Slide group, click the **Push** transition. You will see the Live Preview of the transition from slide 1 to slide 2.
3. Click the **Wipe** transition. Then click the **Split** transition. The previews show different options for introducing the slide.
4. In the Transition to This Slide group, click the **More** button to display the Transitions gallery shown in **Figure 22–23**. The options are organized in three categories: Subtle, Exciting, and Dynamic Content. Under *Exciting*, in the third row, click the **Switch** transition and Live Preview shows the new transition.

FIGURE 22–23
Transitions gallery



5. Note that the Ribbon now displays options for the Exciting category. In the Transition to This Slide group, click the **Cube** transition.
6. In the Transition to This Slide group, click the **Effect Options** button, and then click **From Left**. A preview of the transition is shown.
7. In the Timing group, using the up arrow in the *Duration* box, change the setting to **02.00**. In the Preview group at the left, click the **Preview** button. Note that the transition is now slower.
8. In the Timing group, click the **Apply To All** button. The transition settings are applied to all slides in the presentation.
9. Go to slide 3. Because the Cube transition was applied to all slides, the Cube transition is selected on the Ribbon. In the Timing group, click the **Sound** list arrow to show a list of sound options. In the list, click the **Drum Roll** option, and then click the **Preview** button on the Ribbon. Because you did not click the Apply To All button, the sound will occur only with the transition for this slide.

10. In the Timing group, under *Advance Slide*, click to disable the default option **On Mouse Click**. Enable the option **After**, and then use the up arrow next to the *After* box to set the timer to **00:05.00**. In Slide Show view, the slide show will automatically advance to the next slide after 5 seconds.
11. Go to slide 1. On the status bar, click the **Slide Show** view button, and click the mouse to move through the slides to see the effects of the transitions. You do not need to click the mouse when the slide with the chart appears. The slide show automatically advances to the next slide after 5 seconds.
12. Press **Esc** to return to Normal view.
13. Save the changes, and close the presentation.
14. If time permits, reopen **Revised Rescued Pets 3** from your solution files and explore other transitions and speed and sound options, then close the presentation without saving the changes. Leave PowerPoint open for the next Step-by-Step.

Formatting Animations

When you add ***animation***, you add special visual or sound effects to text or an object. Without animation, text and objects automatically appear all at once when a slide is opened in Slide Show view. However, when you format animations for the text boxes and graphics, you can control how and when the text and graphics appear on each slide.

VOCABULARY
animation
entrance effects
emphasis effects
exit effects
motion paths
trigger

Applying Animations

PowerPoint provides many built-in animations for four types of effects. ***Entrance effects*** control how the object enters onto the slide. ***Emphasis effects*** draw attention to an object that is already visible on the slide, and ***exit effects*** control how an object leaves the slide. ***Motion paths*** enable you to create a path for the object to follow on the slide, which you will practice in Step-by-Step 22.7. The animation options for each type of effect are organized in four categories: Basic, Subtle, Moderate, and Exciting. By default, a mouse click is the ***trigger***, the instruction that starts the animation segment.

Step-by-Step 22.6

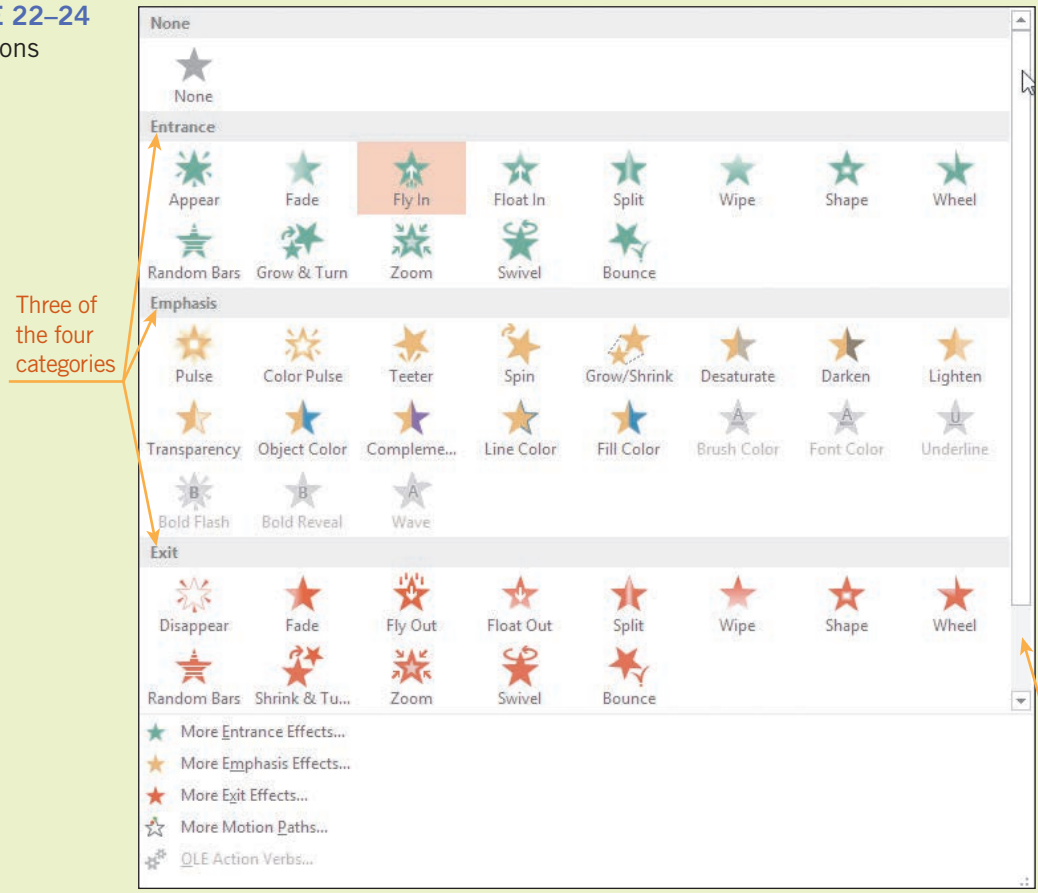


IC3 2-4.3.2

1. Open the file **Revised Time Management 2** from your solution files. Save the Revised Time Management 2 presentation as **Revised Time Management 3**, followed by your initials.
2. Go to slide 2. Click the **clock** picture to select it, and then click the **ANIMATIONS** tab. In the Animation group, click the **Fly In** animation. A preview of the animation shows the illustration fly in from the bottom of the slide.

3. In the Animation group, click the **More** button to show the Animation gallery shown in **Figure 22–24**. The animations are organized in four categories: Entrance, Emphasis, Exit, and Motion Paths. If necessary, use the scroll bar on the right to scroll down through the gallery.

FIGURE 22–24
Animations gallery



QUICK TIP

If you do not automatically see a preview of the animation, in the Preview group at the left side of the ANIMATIONS tab, click the Preview button arrow, and then enable the AutoPreview option.

4. Under *Entrance*, click the **Wheel** animation. Live Preview shows how the animation appears in the slide pane, and the gallery closes. To see the animation again, in the Preview group at the far left side of the ANIMATIONS tab, click the **Preview** button. Note that the numeral *1* appears to the left of the picture, indicating the first animation format on that slide. Also note that a star shape is displayed to the left of the slide 2 thumbnail in the Slides pane, indicating that an animation, a transition, or both are applied to the slide.

5. Go to slide 3. Click the **Time lost is never found** text placeholder to select it. In the Advanced Animation group, click the **Add Animation** button . The Animation gallery opens. Under *Entrance*, click the **Wipe** animation. Live Preview shows the animation, but because it happens so quickly, you may not have seen the preview. In the Slides tab, next to the slide 3 thumbnail, click the **star** shape to see the text disappear and then reappear from the bottom to the top.

6. In the Animation group, click the **Effect Options** button, and then click **From Left**. In the Preview group, click the **Preview** button. The text will now enter from the left. In the Timing group, the *Start* box shows the setting *On Click*, which is the trigger. The animation will not occur in Slide Show view until you click the mouse button.
7. Go to slide 5. Click the slide title **Prioritize** to select the placeholder. In the Advanced Animation group, click the **Add Animation** button, and at the bottom of the menu, click **More Entrance Effects**. The Add Entrance Effect dialog box shown in **Figure 22–25** opens. Point to the *title bar* of the dialog box, and drag the **dialog box** to the right or left to reposition it so you can see most of the content on the slide.

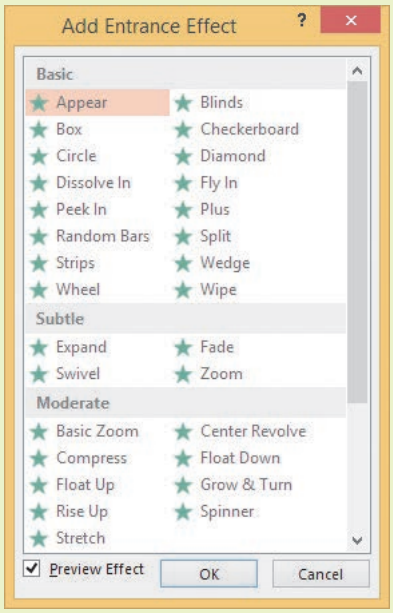
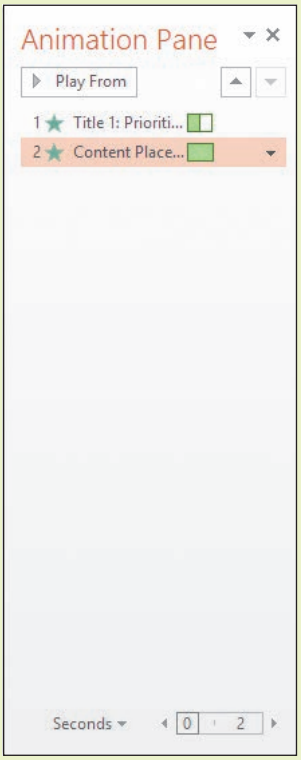


FIGURE 22–25
Add Entrance Effect dialog box

8. There are four categories for entrance effects: Basic, Subtle, Moderate, and Exciting. Use the scroll bar to move to the bottom of the list. Under *Exciting*, click **Float**. A preview of the animation occurs, but the animation is not applied. Under *Exciting*, click **Whip**. Then after the preview, click **OK** to apply the animation.
9. Click anywhere in the **SmartArt** object to select it. Click the **Add Animation** button, and then click **More Entrance Effects**. If necessary, scroll down to view the *Exciting* animations. Note that some of the animation options in the Add Entrance Effect dialog box are dimmed, which means they cannot be applied to the selected object. Under *Subtle*, select the animation **Expand**. After the preview, click **OK**.

10. In the Advanced Animation group, click the **Animation Pane** button. The Animation Pane shown in **Figure 22–26** is displayed at the right. Note in the slide pane that the numeral *2* is displayed to the left of the SmartArt object. In the Animation Pane, click the **2 Content Place** list arrow, and then click **Start With Previous**. Now the numbers to the left of the text box and the SmartArt object on the slide are both the numeral *1*, indicating that both animations will occur at the same time.

FIGURE 22–26
Animation Pane



11. In the Animation Pane, click the **Play From** button to preview the two combined animations. On the Quick Access Toolbar, click **Undo** to restore the animation settings to two separate animations.
12. In the Animation group, click the **Effect Options** button. In the submenu, click **One by One**. Live Preview shows the rows of the object introduced individually. After the preview, the numerals *2* through *7* are displayed to the left of the SmartArt object. In the Animation Pane, below the *2 Content Place* box, click the **Expand** button to show the animations *3* through *7*.
13. Click the **Add Animation** button. If necessary, scroll down to the *Exit* category and click the **Float Out** animation. After the preview ends, in the Animation Pane, click the **8 Content Place** list arrow, and then click **Start After Previous**. This animation causes the rows to exit, one by one, after the last row of the SmartArt object appears. Because the option *Start After Previous* is enabled, the animation is now part of the previous animation, so the number *8* is removed from the animation title.

14. Go to slide 4. Click the **smiley face** object to select it. Click the **Add Animation** button. Under *Emphasis*, click the **Teeter** animation. Preview the animation.
15. Save the changes, and leave the presentation open for the next Step-by-Step.

Rearranging, Changing, and Customizing Animations

If you change your mind after applying animations, you can rearrange the order of animations, remove an animation, or change the existing animation. To change the animation effect, you must first remove the existing animation. If you apply a new animation effect without removing the existing animation, the new effect is added to the object. In other words, the object would have two animations, not one.

You can customize the animations by modifying the timing of the effects. For example, you can make text disappear very subtly by slowing down the duration of the animation, or you can make an object disappear with a much more dramatic exit by making it disappear quickly. You can also format delays before an animation is executed.

Step-by-Step 22.7



IC3 2-4.3.2

1. If necessary, open the file **Revised Time Management 3** from your solution files. Save the Revised Time Management 3 presentation as **Revised Time Management 4**, followed by your initials. If necessary, click the **ANIMATIONS** tab, and then click the **Animation Pane** button to show the Animation Pane.
2. Go to slide 5. In the Animation Pane, click **1 Title 1: Prioritize**. In the Timing group, under *Reorder Animation*, click the **Move Later** button twice. The selected animation is now third in the sequence of animations.
3. In the Timing group, click the **Move Earlier** button. The animations are renumbered both in the Animation Pane and in the slide pane.

4. Click and drag the **2 Title 1: Prioritize** animation to the bottom of the list, under the *7 Content Placeholder*. When a red line appears below the last animation in the list, as shown in **Figure 22–27**, release the mouse button. The title will now be the last object on the slide to be displayed.

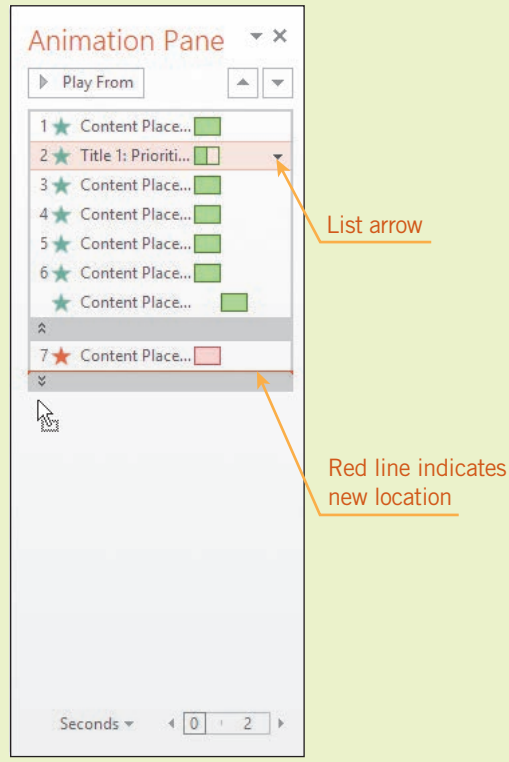
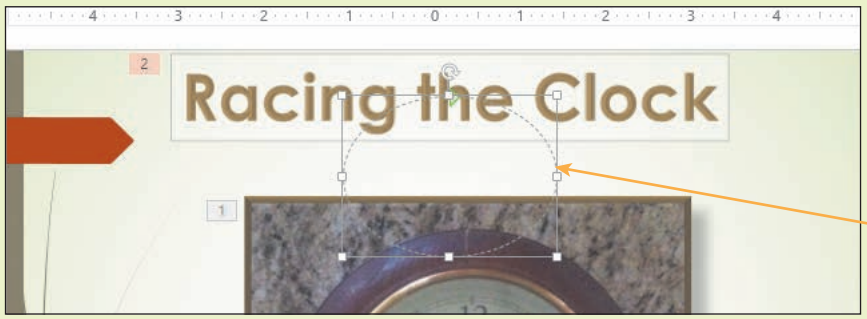


FIGURE 22–27
Rearranging animation order in the Animation Pane

5. Go to slide 4. Click the **smiley face** object, and press **Ctrl+C** to copy it to the Clipboard. Click outside the placeholder to deselect the object, and then press **Ctrl+V** to paste the object on the slide. Drag the **square handle** on the mouth down to create a smile.
6. Note that two animations are displayed in the Animation Pane. The Teeter animation applied to the original object was also copied to the second smiley face object. The copied face on top is still selected. In the Animation Pane, click the **2 Smiley Face** list arrow, and then click **Remove**.
7. In the slide pane, select the copied **smiley face** object. In the Animation group, click the **More** button. Under *Entrance*, click the **Fade** animation. In the Timing group, change the Duration setting to **01.00**, and change the Delay setting to **01.50**. When you click to trigger the animation, there will be a pause of 1.5 seconds before the animation begins, and then the animation will play over a 1-second time span.

8. Select the copied **smiley face** object, and reposition it so it is positioned exactly over the original smiley face object. (*Hint*: Use the arrow keys to move the object.) Preview the animation to see the frown turn into a smile.
9. Go to slide 2. Click anywhere inside the **WordArt** text box *Racing the Clock*. If necessary, click the **ANIMATIONS** tab. Click the **Add Animation** button. Scroll down and under *Motion Paths*, click the **Shapes** animation. The motion path previews and a diagram illustrating the path is displayed over the WordArt object as shown in **Figure 22–28**.



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FIGURE 22–28
Motion path diagram

10. In the Animation pane, click the **Rectangle 2: Racing the Clock** list arrow and then click **Start With Previous**. The motion animation for the WordArt object plays at the same time the picture enters the screen.
11. Switch to Slide Show view. Advance through the slides. Remember that many of the elements will not appear without the trigger of a mouse click. Also remember that after the last row appears in the SmartArt object on slide 5, the rows will automatically exit the slide without a trigger, but you will need to click to see the slide title animation.
12. At the end of the slide show, click the mouse button to exit Slide Show view and return to Normal view. Save the changes and close the presentation. Leave PowerPoint open for the next Step-by-Step.

ABOVE AND BEYOND

You can easily reposition motion paths on the slide by dragging and dropping the motion path on the screen. You can also create custom motion paths. Select the object on the slide. Click the Add Animation button and then under Motion Paths, click Custom Path. The mouse pointer changes to cross. Drag the pointer across the screen to identify the path, and double-click at the end of the path.

Adding Audio and Video to a Presentation

Sound and video add an extra dimension to a presentation. You can use sound and video at any point in a presentation to add emphasis or set the mood for the audience.

Inserting Video and Audio Clips

PowerPoint supports many video and audio file formats. Online audio clips are available in the Office.com Clip Art gallery. You can also insert audio files that are stored on your computer or that you can access from another source such as a flash drive, a network connection, or the Cloud.

ABOVE AND BEYOND

If your computer is equipped with a sound card, a microphone, and speakers, you can record your own audio clip. In the Media group on the INSERT tab, click the Audio button and then click Record Audio. The Record Sound dialog box opens and you can start recording.

You can insert video files that are stored on your computer or that you can access from another source. PowerPoint makes it easy for you to insert video files that you have stored in your SkyDrive folders or that you can access on a social networking site.

Step-by-Step 22.8

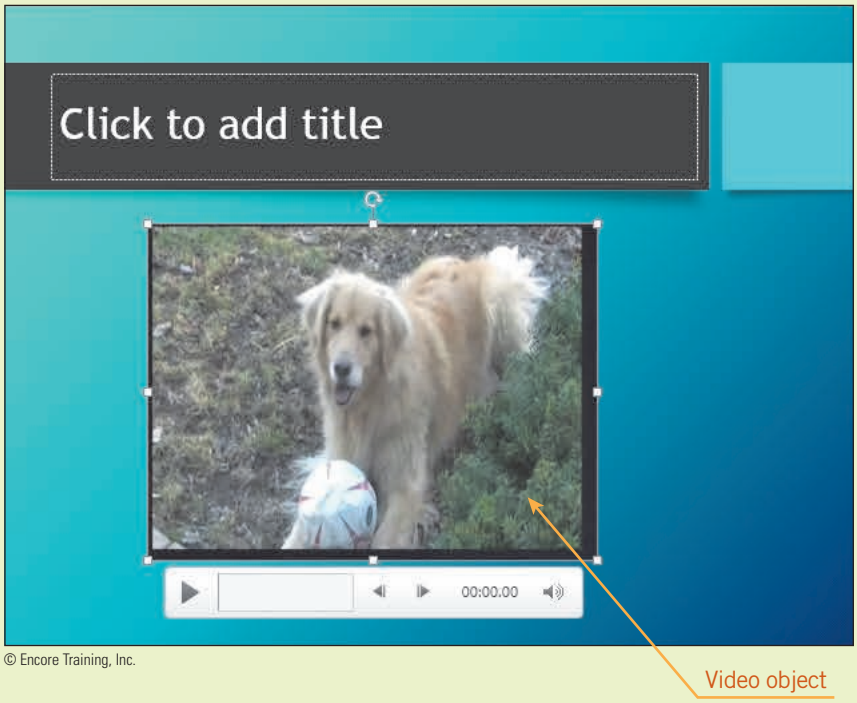
IC3
2-1.3.5
2-1.4.2
2-4.1.3

1. Open the file **Revised Rescued Pets 3** from your solution files, and save the Revised Rescued Pets 3 presentation as **Revised Rescued Pets 4**, followed by your initials.
2. Slide 1 is the active slide. Insert a new slide with the **Title and Content** layout. The new slide 2 is the current slide. In the content placeholder, click the **Insert Video** button. The Insert Video dialog box opens. Next to *From a file*, click the **Browse** button and navigate to the drive and folder where your Data Files folder is stored, and select **Dog Video.mp4**. Then click **Insert** to add the video file to the presentation file.
3. Compare your screen to **Figure 22–29**. A graphic representing the video appears on the slide. Because the video graphic is selected, the VIDEO TOOLS FORMAT tab is displayed.

QUICK TIP

To insert a video file from your SkyDrive account, in the Media group on the INSERT tab, click the Video button and then click Online Video. The Insert Video dialog box will display a link to browse folders in your registered SkyDrive account.

FIGURE 22–29
Video graphic positioned on a slide



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ABOVE AND BEYOND

Video and audio files can be quite large, so to avoid making the presentation file too large, you can create a link to the video/audio file. When you show the slide show, the link locates and reopens the video or audio file. Therefore, it is important that the link for the target file is maintained and the computer you are using for the slide show is able to access the target file.

4. Click the **VIDEO TOOLS PLAYBACK** tab. In the Video Options group, click the **Start** list arrow, and then click **Automatically**. Click to enable the **Play Full Screen** and **Hide While Not Playing** options. Your settings should be the same as those shown in **Figure 22–30**.

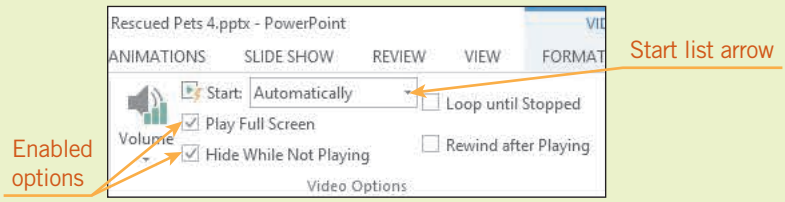


FIGURE 22–30
Video Options group on the VIDEO TOOLS PLAYBACK tab

5. Switch to **Slide Show** view to watch the video in full screen. Initially the screen will show a blank slide, and then the video will automatically play. When the video ends, press **Esc** to return to Normal view.
6. Go to slide 6. Click the **INSERT** tab. Do one of the following:
   a. If you have an Internet connection, go to Step 7.
   b. If you do not have an Internet connection, go to Step 9.
7. In the Media group, click the **Audio** button and then click **Online Audio**. The Insert Audio dialog box opens. The insertion point is positioned in the *Office.com Clip Art* search box. Type **dog** and then click the **Search** button (or press **Enter**). Several audio clips that match the search text will display, similar to those shown in **Figure 22–31**.

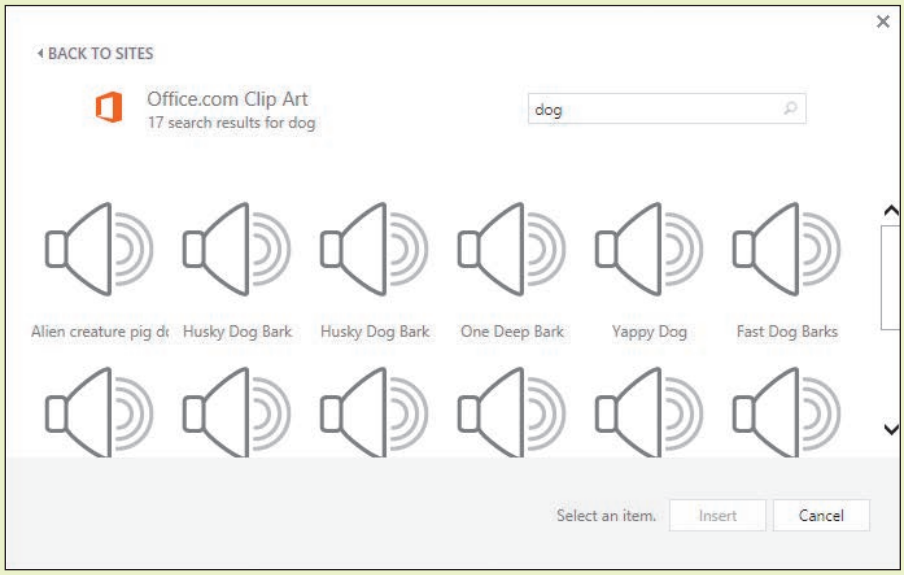


FIGURE 22–31
Online audio search results from Office.com Clip Art gallery

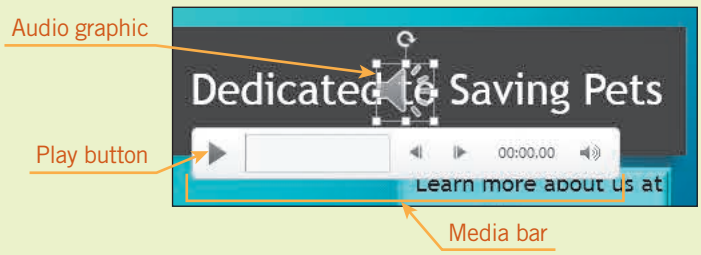
8. Scroll through and point to some of the thumbnails to preview some of the results. To download one of these audio clips, you would select the thumbnail and then click Insert. Instead, click **Cancel** to close the search results. Then, close the Insert Audio dialog box.

ABOVE AND BEYOND

If you want to trigger a video manually, use the default Start setting On Click and confirm that the Hide While Not Playing option is disabled. In Slide Show view, you will need to click the video graphic on the slide.

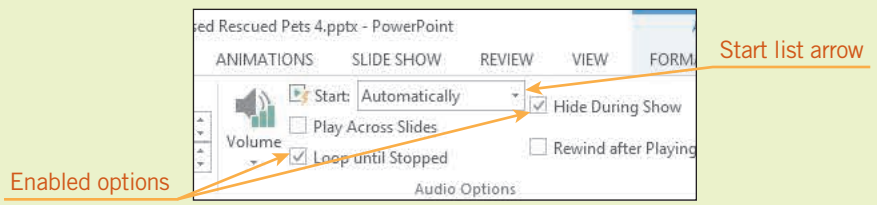
9. In the Media group on the INSERT tab, click the **Audio** button arrow and then click **Audio on My PC**. The Insert Audio dialog box opens. Navigate to the drive and folder where your Data Files folder is stored. Select the file **Dog Bark.wav**, and then click **Insert**. An audio graphic and a media bar are inserted in the center of the slide as shown in **Figure 22–32**. Also, the AUDIO TOOLS PLAYBACK tab displays.

FIGURE 22–32
Audio graphic and media bar



10. The audio graphic is already selected. Point to a *border* for the audio graphic and then when the pointer changes to a four-headed area, drag the **audio graphic** to the lower-right corner of the slide. The media bar will move with the audio graphic.
11. On the media bar, click the **Play** button to preview the full audio clip.
12. In the Audio Options group on the AUDIO TOOLS PLAYBACK tab, click the **Start** list arrow, and then click **Automatically**. Enable the **Hide During Show** and **Loop until Stopped** options. Your settings should be the same as those shown in **Figure 22–33**.

FIGURE 22–33
Audio Options group on the AUDIO TOOLS PLAYBACK tab



13. Switch to Slide Show view. The audio clip will play automatically, and the clip will continue to play until you click the mouse button. When you've heard enough, click **Esc** to end the slide show.
14. Save the changes and leave the presentation open for the next Step-by-Step.

Distributing Presentations

PowerPoint offers several options for distributing your presentation. Obviously, the primary way to distribute the presentation is to project the slide show before an audience. In addition, you can provide hard copies of slides, handouts, the presentation outline, and speaker notes. You can also distribute electronic copies (soft copies) of the presentation. Others who have access to the files can provide feedback by adding comments to the slides. If you are unable to make your presentation in person, you can instead share the presentation via e-mail, Web pages, or over networks.

Printing Handouts and Speaker Notes

You can print individual slides, the presentation outline, and speaker notes. You can also prepare handouts by formatting the slides in the various page layouts available in Word documents.

Step-by-Step 22.9

IC3
2-1.1.4
2-6.1.1
2-6.1.3

1. If necessary, open the file **Revised Rescued Pets 4** from your solution files and save the Revised Rescued Pets 4 presentation as **Revised Rescued Pets 5**, followed by your initials.
2. Go to slide 2. Click the **REVIEW** tab. In the Comments group, click the **New Comment** button. The Comments pane displays on the right side of the screen, and the insertion point is positioned in a comment box with the user name. Type **Why is there no title on this slide?** and then press **Enter**.
3. Assume that someone else wrote that comment and you want to respond. Inside the comment box, click the **Reply** text box. Type **Because the video will play full screen.** and then press **Enter**. Compare your Comments pane to the one shown in **Figure 22–34**, and then close the Comments pane. Two comment icons now appear in the upper-left corner of the slide. When you click the Comment icon on the slide, the Comments pane will open and show the comments.

QUICK TIP

You can also add comments and navigate to existing comments using the New, Previous, and Next buttons in the Comments pane. To delete a comment, select the comment in the Comments pane and then click the Delete button in the Comments group on the REVIEW tab.



FIGURE 22–34
Response to a comment in the Comments pane

4. Click the **FILE** tab, and then click **Print** to open the Print options in Backstage view. **Figure 22–35** shows the default print settings. Your printer name will differ.

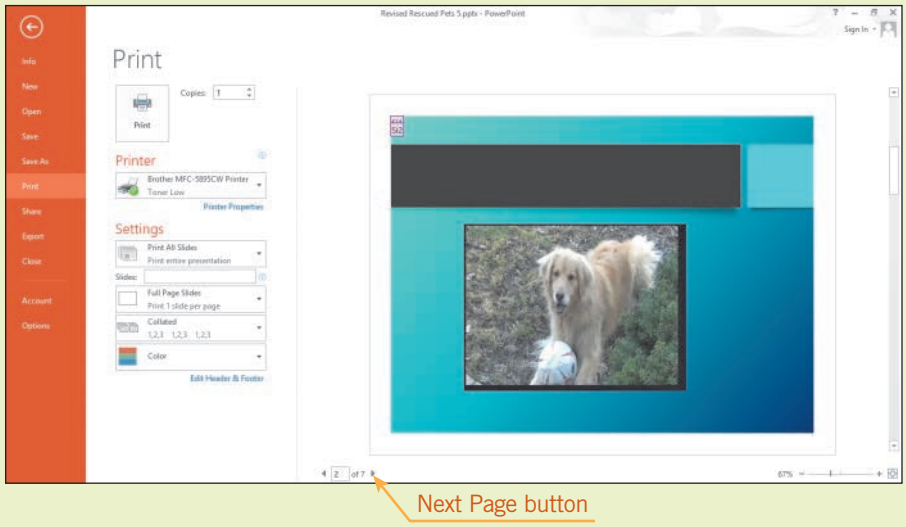


FIGURE 22–35
Default print options in Backstage view

5. In the middle pane, under *Settings*, the *Print All Slides* option is selected, and a preview of the first slide as it will print appears in the right pane. At the bottom of the right pane, click the **Next Page** button to advance to the preview of the comments you added to the slide. Then continue to click the **Next Page** button to preview each slide on a separate page.
6. In the middle pane, under *Settings*, click **Print All Slides**, and then in the menu below click **Custom Range**. The insertion point is positioned in the *Slides* box. Type **1-3,6** in the Slides box. This custom range includes slides 1, 2, 3, and 6.
7. Under *Settings*, click **Full Page Slides**. A menu with additional options displays above. Note that at the bottom of the menu the option to print comments and ink markup is enabled. Comments would print on a separate page.
8. Under *Handouts*, click the **6 Slides Horizontal** layout. Although you chose a layout for six slides, only four slides are displayed in the preview pane because you only identified four slides in the custom range.
9. Under *Settings*, click **6 Slides Horizontal**. The menu opens above. Under *Handouts*, click the **3 Slides** layout. The preview changes and now includes lines for notes next to each of the printed slides.

10. Under *Settings*, click **Custom Range**, and then in the menu below, click **Print All Slides**. Then under *Settings*, click **3 Slides**, and under *Print Layout*, click the **Notes Pages** layout.
11. At the bottom of the right pane, click the **Next Page** button to advance to the preview of each of the slides. An image of each slide is displayed on a page by itself. There are notes in this presentation, but when there are notes on a slide, the notes from the Notes pane are displayed below the image, and there is plenty of white space on the page to add written notes.
12. Under *Settings*, click **Notes Pages**, and then, under *Print Layout*, click the **Outline** layout. A preview showing a list of all six slides is displayed in the preview pane. If the slide contains text in placeholders, that text is displayed in the outline. However, when you add a text box to a slide as you did for slide 3 in this presentation, the text box text is not displayed in the outline.
13. In the left pane, click **Export**. In the middle pane, click **Create Handouts**. In the right pane, click the **Create Handouts** button. The Send to Microsoft Word dialog box shown in **Figure 22–36** opens.

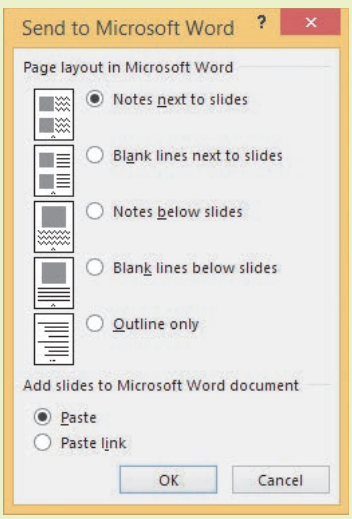


FIGURE 22–36
Send to Microsoft Word dialog box

14. In the Send to Microsoft Word dialog box, enable the option **Blank lines next to slides**, and then click **OK**. A new Word document is created and opens in the Word application. If necessary, in the taskbar at the bottom of the screen, click the **Document1 - Word** button. Scroll through document and then save the document as **Rescued Pets Handouts**, followed by your initials.
15. Close the Word document and the Word application. Save the changes to the presentation and leave the presentation open for the next Step-by-Step.

Preparing Presentations for Electronic Distribution

When distributing electronic copies of the presentation, you must be connected to a network or the Internet, and you must have sufficient bandwidth for transferring the electronic files. Before sharing the presentation, you may want to control what others can see in the file. For example, you may not want them to see the author of the presentation or the date the presentation was created. Information like this can easily be removed from the file by inspecting the file.

In Word and Excel, you learned how to save documents in PDF and XPS formats. You can also save presentations in these formats. Readers can see the slides, but they cannot edit the slides or use them in a slide show.

You can share your presentations in the Cloud using your SkyDrive account. You can also present your slides online using Office Presentation Service, a new service that Microsoft offers all Office 2013 customers. You create a link so that others can view the presentation online. You must have a Microsoft account to start the online presentation. Another way to distribute a presentation is to publish the slides to a document management server or to a document workspace. To publish slides to a document management server or to a document workspace, you must have authorization to publish to or access files from a document workspace or document management server.

QUICK TIP

A computer must be properly configured to output or receive and open PDF and XPS documents. Microsoft provides a free add-in that you can download so you can use the PDF and XPS formats.

Step-by-Step 22.10

IC3
2-6.1.2
2-6.2.1
2-6.2.2
2-6.2.3

1. If necessary, open the file **Revised Rescued Pets 5** from your solution files.
2. Click the **FILE** tab to open Backstage view. In the left pane, Info is already selected. In the middle pane, click the **Check for Issues** button, and then click **Inspect Document**. The Document Inspector dialog box opens.
3. Make sure that the **Document Properties and Personal Information** box is checked, and then at the bottom of the dialog box, click **Inspect**.
4. The results are displayed in the Document Inspector dialog box. An exclamation point appears next to *Comments & Annotations*, *Document Properties and Personal Information*, and *Presentation Notes*. Click all **Remove All** buttons in the dialog box to remove this information from the file.
5. The status update displays in the dialog box. Click **Reinspect**, and then click **Inspect** to check one more time. Close the dialog box. Save the changes to the presentation. Under *Document Properties and Personal Information*, the inspection results show ** Picture crop information* was found. This note sometimes displays because of the theme applied to the presentation. Click **Remove All** and then close the Document Inspector dialog box.

6. If necessary, click the **FILE** tab to open Backstage view, and then click **Share**. The Invite People option is already selected, and you would use this option to save the document in the Cloud using your SkyDrive account.
7. In the middle pane, click the option **Email**. Do one of the following:
   a. If you have an e-mail account set up on your computer, go to Step 8.
   b. If you don't have an e-mail account set up on your computer, go to Step 10.
8. In the right pane, click the **Send as PDF** button. A new message window is opened in your e-mail application, and a PDF version of the document is already attached to the message. The presentation file format was converted to PDF, but the PDF file has not been saved on your system.
9. Close the message and the e-mail application without saving any changes.
10. If necessary, click the **FILE** tab to open Backstage view. Click **Export**. In the middle pane, the option *Create PDF/XPS Document* is already selected. In the right pane, click the **Create PDF/XPS** button. The Publish as PDF or XPS dialog box opens.
11. Navigate to the folder where you save your solution files. If necessary, change the *Save as type* box setting to **XPS Document (*.xps)**. Click **Publish**. The presentation opens in XPS Viewer. Scroll through and preview the slides in XPS format. All the document formats are fixed. Obviously, the video and audio will not play. Press **Alt+F4** to close the XPS Viewer. If necessary, click the **Desktop** tile on the Windows start screen.
12. The Revised Rescued Pets 5 presentation should still be open. Click the **FILE** tab, and then click **Share**. In the middle pane, click **Present Online**. A brief description of the service is provided in the right pane. You must have an Internet connection and a Microsoft account to share the presentation online.
13. In the middle pane, click **Publish Slides**. A brief description of the service is provided in the right pane. You must have an Internet connection and authorization to publish to or access files from a document workspace or document management server.
14. Press **Esc** to exit Backstage view. Save the changes and close the presentation.

ETHICS IN TECHNOLOGY

Respecting Intellectual Property

The term intellectual property is used to refer to information, material, or processes that were created by and belong to a person or corporation. Computers make it very easy to copy and disseminate art, documents, inventions, and music, and this has created many legal concerns about the rights of a creator.

Often people think that any information available on the Internet is in the public domain and free for the taking. This is not always the case. There are protections for intellectual property, including copyright for literary works, art, and music; patents for inventions and procedures; trademarks for company and product logos; and trade secrets, which include recipes, codes, and manufacturing processes. Be careful not to use protected material in your own work without securing permission from the person who owns the material. And when referencing this information in classroom assignments, give credit to those who own the material by citing sources in the slide show and in your presentation handouts.

SUMMARY

In this lesson, you learned:

- Graphics help to clarify the message of your presentation. Graphics can help your audience remember your message, and PowerPoint makes it easy for you to add graphics to a slide.
- You can create WordArt, shapes, and SmartArt graphics to add visual effects to slides.
- You can easily reposition and resize graphics and text boxes on slides, and you can also format the objects with borders and shading.
- Placeholders make it easy to create a table or chart to illustrate numerical data or trends.
- You can add hyperlinks to text and graphics so you can link slides to other slides, other documents, or Web pages.
- The slide transition affects how each new slide appears. You can apply transition settings to a single slide or to all the slides in the presentation.
- PowerPoint provides special effects that can add emphasis, animation, or sound to the text and graphics, or that can enhance how a slide opens or closes.
- You can easily insert sound and video clips on slides and format the clips to play automatically.
- PowerPoint provides several options for distributing presentations via hard copies and electronic copies.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. Before sharing a presentation, you can control the personal information users can see by inspecting the file.

T F 2. You can choose a sound effect that plays as the transition occurs.

T F 3. You can apply slide transition settings to a single slide.

T F 4. You can change the duration of an animation effect.

T F 5. You can save presentations in PDF and XPS formats.

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. _____ control how and when the text and graphics appear on each slide.
2. A(n) _____ effect controls how the object enters onto the slide.
3. A(n) _____ effect draws attention to an object that is already visible on the slide.
4. A(n) _____ effect controls how an object leaves the slide.
5. _____ enable you to create a path for the object to follow on the slide.
6. _____ are settings that control how a slide is introduced as you move from one slide to another in Slide Show view.
7. When a graphic is selected, eight _____ appear on the border of the graphic.
8. The _____ is the instruction that starts the animation segment.
9. Inserting clip art and photographs from a gallery of clip art files that Microsoft provides at Office.com is called inserting a(n) _____.
10. Hyperlinks are only functional in _____ view.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What happens when you apply a new animation effect without removing the existing animation?

2. Describe how to resize a graphic proportionally.

3. If you choose to provide hard copies of your presentation, what items in the presentation can you print?

4. What is the benefit of adding graphics to the slides in a presentation?

5. Explain how you can share a presentation without making your presentation in person.

PROJECTS

PROJECT 22–1

IC3 2-1.2.1 2-1.2.2 2-1.4.1 2-1.4.2 2-4.1.2 2-4.1.3 2-4.1.5 2-4.3.3

1. Open the file **Resort** from the drive and folder where your Data Files folder is stored. Save the Resort presentation as **Revised Resort**, followed by your initials.
2. Review the slide content, and apply an appropriate theme or background. Modify the color and/or font styles if desired.
3. On slide 2, create a SmartArt graphic using a List layout and design of your choice. Modify the colors if desired. Type the following in the SmartArt text boxes:

   Pure nature

   Eco-friendly

   Conservation of natural heritage

4. On slide 3, insert the picture file **Scenic View.jpg** from where your Data Files folder is stored. Apply an enhancing style, border, or effect, and resize or reposition the picture or placeholders as needed.
5. On slide 4, insert the picture file **Horseback.jpg** from where your Data Files folder is stored. Apply an enhancing style, border, or effect, and resize or reposition the picture or placeholders as needed.
6. On slide 5, insert a 2 × 6 table, and add the data below. Resize and reposition the table as needed so it fits in the center of the slide, and, if desired, change the table style and colors and column widths.

Activity	Regulation
Fishing/crabbing	Permitted in designated areas
Boats	Permitted from May 1 to October 1
Hiking/biking	Trails open year round
Camping	Permitted from May 1 to October 1
Open fires	Prohibited except by permit

7. On slide 6, remove the bullet format from the last line of text. Center the text for the URL, and then create a hyperlink to the URL.
8. Apply an appropriate slide transition to all the slides. If necessary, adjust the duration, and include sound effects if desired.
9. On slide 3, insert the audio clip **Glade Birds.wav** from the drive and folder where your Data Files folder is stored. Reposition the audio graphic in the lower-right corner of the slide. Format the audio clip to play automatically, hide the audio graphic during the show, and loop the audio clip until stopped.
10. Preview the slide show, and make any necessary changes. Save the changes to the presentation.
11. Save the presentation in PDF format, using the same filename. Close the Adobe Reader application.
12. Close the presentation.

PROJECT 22–2

2-1.2.1
2-1.4.1
2-1.4.2
2-4.1.2
2-4.1.3
2-4.1.4
2-4.1.5
2-4.3.2
2-4.3.3
2-6.2.2

1. Open the file **Waste Report** from the drive and folder where your Data Files folder is stored. Save the Community Report presentation as **Revised Waste Report**, followed by your initials.
2. Review the slide content, and apply an appropriate theme or background. Modify the color and/or font styles if desired. If necessary, reposition the text placeholders.
3. Go to slide 2. In the placeholder, create a 3-D Pie chart by adding the data below in the Excel spreadsheet. Save the workbook as **Waste Data**, followed by your initials, and then close the Excel application. Adjust the size of the chart and legend as needed.

	% of Waste
Residential	48.1
Commercial	34.6
Construction	9.8
Yard	7.5

4. On slide 3, in the placeholder on the right, insert the picture file **Recycle Bucket.jpg** from your Data Files folder. Apply an enhancing style, border, or effect, and resize or reposition the picture or placeholders as needed.
5. On slide 3, apply an animation to the picture so the picture fades in starting after the previous. Change the duration setting to 03.00.
6. On slide 3, apply an entrance animation to the bulleted list so that the bulleted items will appear one paragraph at a time, triggered with a click. Change the duration setting to 01.50. Go to slides 4 and 5, and apply the same settings for the bulleted lists on those slides.
7. On slide 6, in the placeholder, insert a 5 × 5 table, and enter the data below in the Word table. Adjust the table size and formats as needed.

	2000	2005	2010	2015
Aluminum	18%	21%	29%	39%
Glass	12%	14%	19%	27%
Paper	22%	39%	44%	49%
Plastics	3%	5%	6%	17%

8. On slide 7, insert the media clip **Recycle Video.mp4** from your Data Files folder. Format the video to play automatically. Hide the image during the show, and enable the settings so the movie fills the screen when playing.
9. Format a transition for all slides. Change the effects as needed for an effective transition. Change the settings so that all the slides advance automatically after 2 seconds.
10. View the slide show from the beginning. After the *Make a difference!* slide appears, you should not have to click. The next slide appears automatically, and the video starts. Exit Slide Show view and return to Normal view.
11. Inspect the document, and remove the document properties, personal information, and the presentation notes.
12. Save the changes, and close the presentation.

PROJECT 22–3

2-1.2.1
2-1.4.1
2-1.4.2
2-4.1.1
2-4.1.3
2-4.1.5
2-4.3.2
2-4.3.3

To complete this project, you will need access to the Internet.

1. Open the file **Productivity** from the drive and folder where your Data Files folder is stored. Save the Productivity presentation as **Revised Productivity**, followed by your initials.
2. Review the slide content. Apply an appropriate design or background. Modify the color and/or font styles if desired. If necessary, resize and reposition the text placeholders.
3. Go to slide 2. Search for online pictures that help describe "deadline." Insert the picture and position in the middle of the slide. Resize if needed. Then create a WordArt text box. Using a style that complements the picture. Type **The clock is ticking…** in the WordArt text box and position the text box above the picture at the top of the slide.
4. After slide 3, insert a new slide with the Two Content layout. Add the title **Organize**. Insert an online picture in the content placeholder on the left to illustrate a messy or cluttered desk, or an individual overwhelmed with work. Insert an online picture in the content placeholder on the right to illustrate organized documents, such as a file drawer or file cabinet. If you use a photograph on the left, then use a photograph on the right. Resize and/or crop the pictures as needed so they are approximately the same size.
5. On slide 3, add animation effects so the picture on the left appears first triggered by a click, and then the picture on the right appears triggered by a click. If desired, change the duration and delay settings for the animations. Then insert a right arrow shape between the two pictures. Apply a shape style that complements the other objects on the slide. Animate the shape and then reorder the animations so that the arrow appears after the picture on the left and before the picture on the right.
6. Insert a new slide after slide 3, using the Comparison layout. Type the title **Plan Ahead** in the title placeholder. Type **Daily/Weekly Planner** in the subheading placeholder on the left. Type **Monthly Planner** in the subheading placeholder on the right.
7. Insert appropriate online pictures below each subheading to illustrate using planners and calendars. If you use an illustration on the left, then use an illustration on the right. Resize and reposition the graphics as needed, and apply borders to the images if desired.
8. Insert a new slide after slide 4 with the Title and Content layout. Type the title **The clock is ticking…** in the title placeholder. Insert an online picture of a clock.
9. Search for an online audio clip of a clock ticking. Reposition the audio graphic in the lower-right corner of the slide. Format the audio clip to play automatically, hide the audio graphic during the show, and loop the audio clip until stopped.
10. Apply slide transitions with sound effects, if desired.
11. Preview the presentation in Slide Show view.
12. Save the changes and close the presentation.

TEAMWORK PROJECT

PowerPoint provides many features that empower you to be creative and show your preferences of styles. Choose a partner, and review your solution files for Projects 22–1, –2, and –3 in this lesson with each other. Add comments to the slides providing constructive feedback regarding whether or not you think their choices of graphics, transitions, and animations are effective.

IC3
2-1.4.2
2-4.1.3
2-4.3.2
2-4.3.3
2-6.1.1
2-6.1.3

CRITICAL THINKING

CRITICAL THINKING 22–1

IC3
2-1.1.4

You have prepared a presentation with 32 slides. Most of the slides include a title and a picture or a graphic, and only a few of the slides included bulleted lists with text. You added comments in the Notes pane as reminders for the key points related to each slide. You will be presenting the slide show in a few days. Consider all the printing options, and then choose which option would be most useful to you when showing the slide show in front of an audience.

1. Create a new Word document, and save the document as **CT 22–1**, followed by your initials.
2. Write a few sentences explaining which print option you would use and why.
3. Save the changes, and close the document.

CRITICAL THINKING 22–2

IC3
2-1.4.2
2-4.1.3

When you click the Audio button in the Media group on the INSERT tab, you can choose from three options: Online Audio, Audio on My PC, and Record Audio. Explain when you would use the Record Audio feature.

1. Create a new Word document, and save the document as **CT 22–2**, followed by your initials.
2. Describe why the key words are fundamental in searching for online pictures.
3. Save the changes to the Word document.

ONLINE DISCOVERY

Microsoft provides thousands of free clip art—images, photographs, and movie and sound clips—at Office.com, but there are other sources for obtaining media. Choose a topic that interests you, such as energy conservation or mountain climbing. Search the Internet for Web sites other than Office.com that offer free clip art, free photographs, and free sound and video clips. Explore and evaluate three to five Web sites.

1. Create a new Word document, and save the document as **OD 22–1**, followed by your initials.
2. Write a few sentences about each Web site, explaining whether you believe that the site is credible and if the media is truly free and in the public domain. Also comment on whether the site offers quality images and media.
3. Save the changes to the document.

IC3
2-1.3.5
2-1.4.2
2-4.1.3
2-4.1.5

JOB SKILLS

You have been chosen to lead a group project for a fundraiser. You decide the best way to prepare for the first meeting is to create a presentation with the meeting agenda.

1. Create a new PowerPoint presentation, and save it as **JS 22–1**, followed by your initials. Develop at least five slides with an agenda to cover the following topics:
   a. Introduce group members.
   b. Set fund-raising goal to raise $1,000.
   c. Brainstorm ideas.
   d. Assign tasks.
   e. Schedule next meeting.
2. Apply an appropriate design and format the slides as desired. Enhance each slide with a graphic, video, audio, or sound effects. Resize, crop, and reposition images as needed.
3. Save the changes and close the presentation.
4. Create a new Word document, and save the document as **JS 22–1**, followed by your initials.
5. Write a brief summary explaining how you plan to distribute the meeting agenda prior to the meeting.
6. Save the changes, and close the Word document.

IC3
2-1.4.1
2-1.4.2
2-4.1.3
2-4.1.5

EXPLORE AND SOLVE

If you have access to the Internet, explore the photo album templates available in PowerPoint. Review the features provided in the templates, such as backgrounds, themes, layouts, captions, and frames.

1. Create a photo album using your own photos. Customize the album using the available features.
2. Save the document as **ES 22–1**, followed by your initials.

IC3
2-1.3.5
2-1.4.1
2-1.4.2
2-4.1.5



Estimated Time:
2 hours

LESSON 23

Getting Started with Access Essentials

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Identify the parts of the Access screen.
- Customize the application settings.
- Navigate objects in a database.
- Create a database, then create a new table and enter records in Datasheet view.
- Change the column width in a tab.
- Add and delete fields in Design view.
- Change field data types and field properties.
- Add and edit records in a table in Datasheet view.
- Delete and copy records and fields in Datasheet view.

WORDS TO KNOW

cell
data type
database
datasheet
entry
field
field name
field properties
primary key
record
relational database

DATA FILES

To complete this lesson you will need these data files:

Books.accdb
Brady Foundation.accdb
Movies.accdb

Microsoft product screenshots used with permission from Microsoft Corporation.

VOCABULARY
database
relational database

A ***database*** is a collection of related information. Databases can contain all types of data—from an address list to schedules for a soccer tournament. Access is the Microsoft Office database application that enables you to organize, retrieve, and analyze data in many ways.

You might wonder what the difference is between an Excel spreadsheet and an Access database. Actually, there are many similarities in both applications. Like spreadsheets, databases are composed of rows and columns. While both applications enable you to organize, sort, and calculate the data, Access offers much more comprehensive functions for manipulating data. Access is a relational database management system. In a ***relational database***, information is organized into separate subject-based tables, and the relationship of the data in one or more tables is used to bring the data together. For example, a relational database can be used to track the customers, orders, and inventory for a retail business. One table stores information about the customers, one table stores information about the customers' orders, and yet another table stores product information. In Access, the information in the tables can be used to generate invoices based on customer orders. The invoices contain contact information from the customer table, as well as product details from the products table. If the business is planning to send out notices of a sale on a certain product brand, Access can quickly use the information in the orders table and the customers table to generate mailing labels for all those customers who have purchased products of that brand in the past.

Furthermore, in Access you can import or link data from other Access databases, Excel, Outlook, and many other data sources. And, Access data can be exported to many other data formats for use in other applications. Access is a powerful application that offers many features, most of which are beyond the scope of this course. This lesson and Lesson 24 will introduce you to some of the basic features for viewing, entering, editing, querying, and reporting data.

Touchscreen Users

The instructions in the Access lessons generally provide directions for using a mouse to access commands and features. For example, the instructions may refer to actions such as *point, click, double-click*, or *right-click*. If you are using a touch screen, you can use gestures such as *press, tap, slide, swipe*, and *drag* instead of following the directions for using the mouse.

Identifying the Parts of the Access Screen

The Access screen is similar to other Office 2013 applications, with the title bar, Ribbon, Quick Access Toolbar, application window sizing buttons, Close button, and status bar. You can open only one database at a time using the Access Open command. To open a new database in the application window, you will need to close the current database.

As in other Office applications, you can customize the application settings to fit your needs. For example, you can choose how many databases you want to display in the Recent Databases list in Backstage view.

Step-by-Step 23.1

1. Open the Windows Start screen. If necessary, scroll through the Start screen tiles, and then click the **Access 2013** application tile. The opening screen appears as shown in **Figure 23–1**. Recently accessed documents appear in the pane on the left, and templates for creating new databases appear in the Template gallery on the right. The Recent Database list and the templates available in your Template gallery may differ. The word *desktop* in the title will create traditional desktop databases templates, which you will create in this lesson. The templates with a globe icon will create Access apps, which you will learn more about in Lesson 24.

IC3
2-1.1.7
2-1.3.1
2-1.3.3
2-1.3.4

QUICK TIP

If you are using Windows 7 or Vista, click the Start button, click All Programs, click Microsoft Office 2013, and then click Access 2013.

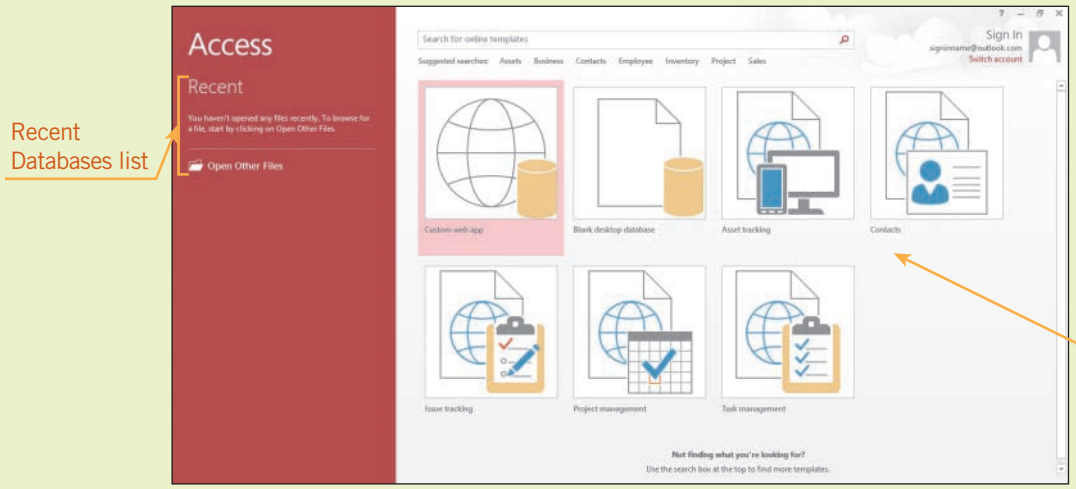


FIGURE 23–1
Opening Access screen

2. In the Template gallery, click the **Blank desktop database** thumbnail. A dialog box similar to the one shown in **Figure 23–2** opens, proposing a name for the new database. Access automatically assigns the name *Database* and a sequential number, followed by the file type extension *.accdb* to each new database.

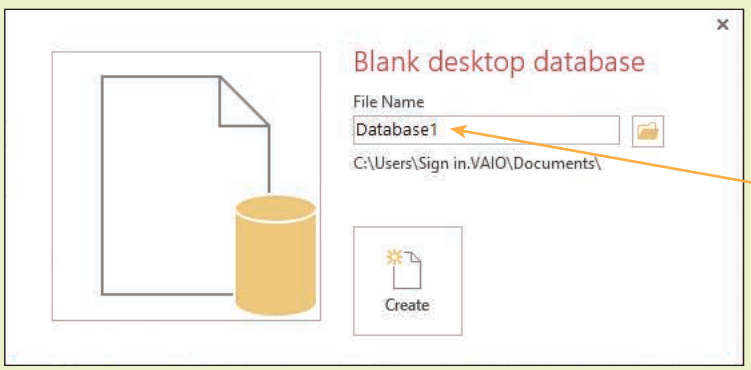


FIGURE 23–2
Blank desktop database dialog box

3. Click the **Create** button to accept the proposed filename. A new database (example: **Database1.accdb**) is opened. Compare your screen with **Figure 23–3** to identify the various components of the Access application window and their names. If the Field List pane displays on the right side of the screen, click the **Close** button to hide the pane.

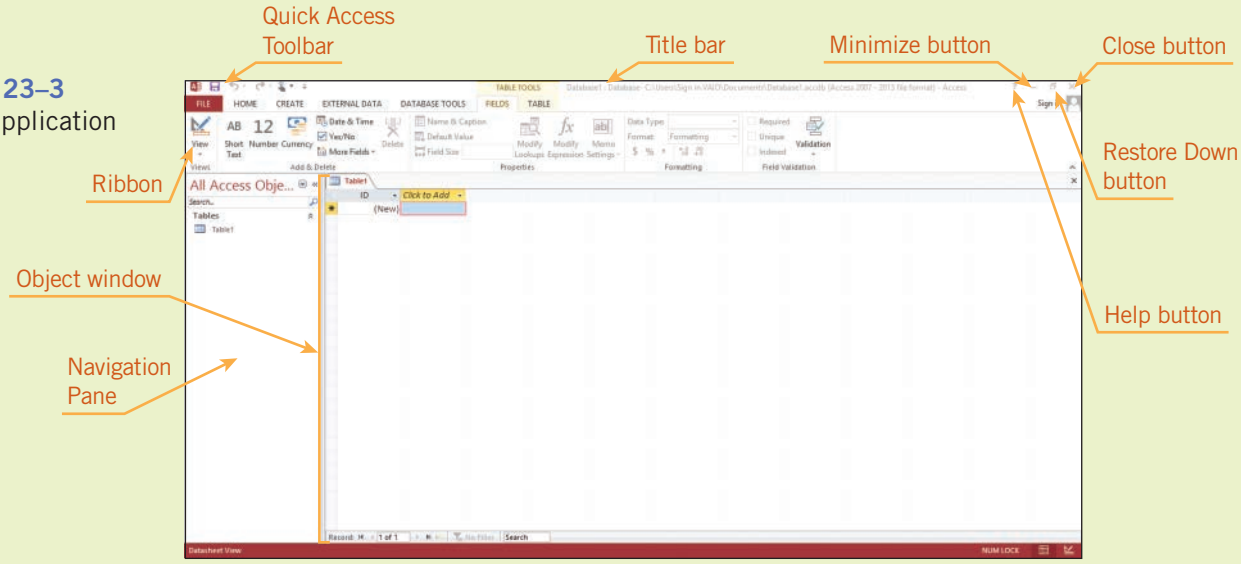


FIGURE 23–3
Access application window

4. If necessary, click the **Maximize button** to change the size of the window to fill the screen. In the upper-right corner of the screen, click the **Minimize** button. In the status bar at the bottom of the screen, click the **Access** button to display the Access window.
5. Click the **FILE** tab and then click **New**. In the Template gallery, click the **Blank desktop database** thumbnail. Access assigns the default filename *Database*, followed by a number sequential to the previous filename (for example Database2). Click the **Create** button.
6. Note that the title bar at the top of the screen shows the new database filename. Point to the *Access* button on the status bar at the bottom of the screen. Note that there is only one database open. The first database that you created was automatically closed when you opened a new database.
7. Click the **FILE** tab and then click **Options**. The Access Options dialog box opens. In the pane on the left, click **Client Settings**. In the pane on the right, drag the **scroll box** in the vertical scroll bar to show the *Display* options as shown in **Figure 23–4**.

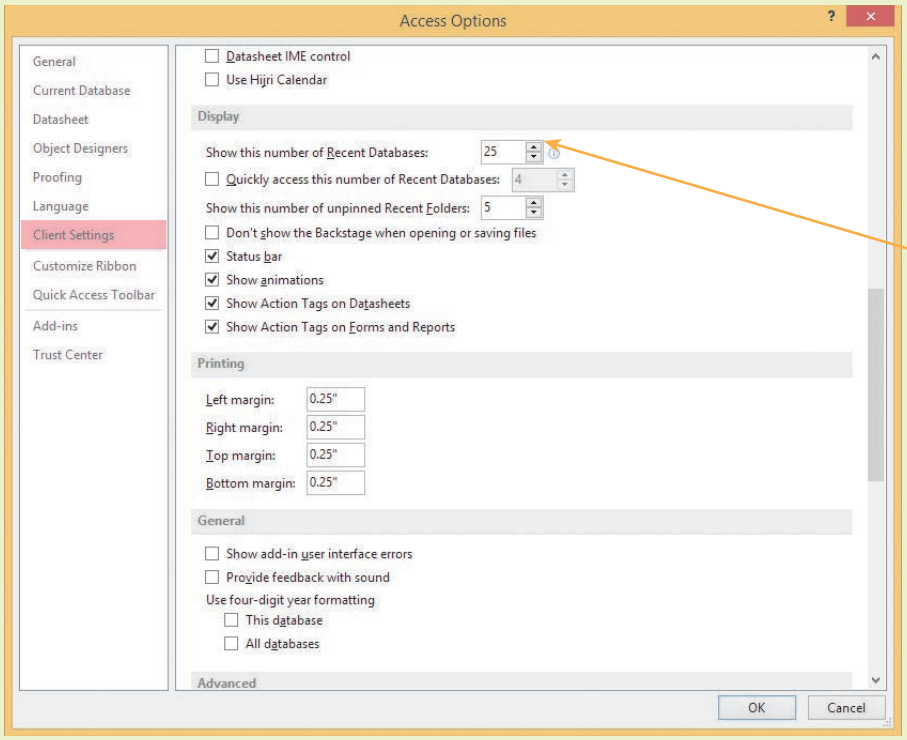


FIGURE 23–4
Client Settings options in the Access Options dialog box

8. Note that you can change the number of databases that display in the Recent Databases list in the left pane.
9. Drag the **scroll box** down some more to show the options under the *Advanced* category. Note that there is a setting *Open last used database when Access starts*. Currently, the setting should be disabled.
10. Because you might share your computer with others, do not make any changes to the settings. At the bottom of the dialog box, click **Cancel**.
11. In the upper-right corner of the screen, click the **Close** button to close the database. Because there is only one database file open, when you click the Close button, the database and the Access application both close. Because you did not make any changes to the database, you are not prompted to save changes.

Navigating the Objects in a Database

Unlike Word and Excel, Access does not have a standard document view. An Access database is composed of objects of several different types. The Access document window changes based on the object with which you are working. **Table 23–1** describes four basic objects (tables, forms, reports, and queries) that you will work with in this lesson and in Lesson 24. These objects help you organize and report the information that is stored in the database.

TABLE 23–1 Basic database objects

OBJECT	PURPOSE
Table	Stores data in columns and rows; all data is stored in a table
Query	Finds and shows data that meet a specified criteria
Form	Makes it easy for you to view, enter, and edit data in a table
Report	Organizes data in a specific layout

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The objects are organized into categories in the Navigation Pane so you can quickly find and access the objects. The Navigation Pane can be collapsed to allow more space for the object.

Step-by-Step 23.2

IC3
2-1.3.1
2-1.3.2
2-1.3.6

1. Start **Access**. At the bottom of the pane on the left, click **Open Other Files**. Recently accessed files display in the right pane. In the middle pane, click **Computer**. The options in the right pane change. In the right pane click the **Browse** button to open the Open dialog box.
2. Navigate to the drive and folder where your Data Files folder is stored. Select the filename **Brady Foundation**, and then click **Open**. If a yellow Security Warning message pane appears below the Ribbon, click **Enable Content**.
3. Compare your screen with **Figure 23–5** to familiarize yourself with the objects in the Navigation Pane. In this database, there are two tables (*Sponsors : table* and *Members : table*), a query (*Prospective Sponsors*), a form (*Sponsors Form*), and a report (*Sponsors Report*).

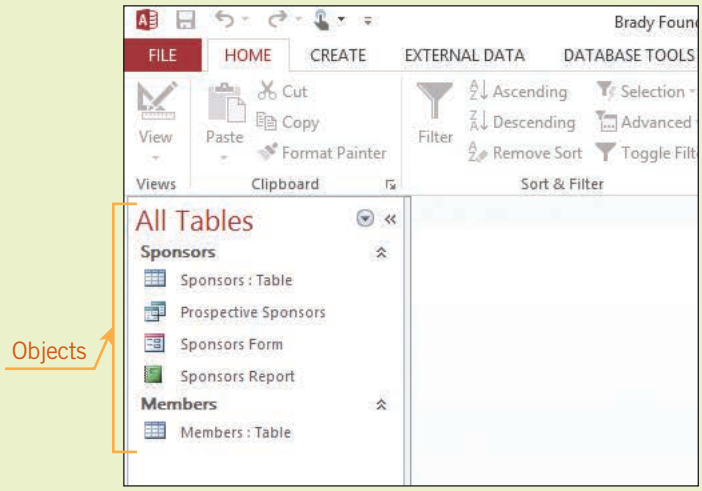


FIGURE 23–5
Objects in the Brady Foundation database file

4. Click the **FILE** tab and then click **Save As** to open the Save Database As options shown in **Figure 23–6**. Note that you can choose to save the entire database or the object that is currently active in the database. Also, note that there are several options for file types so that the database will be compatible with previous versions. The highlighted file type option *Access Database* is the default format. Click **Save As** button to accept that format. The Save As dialog box opens.

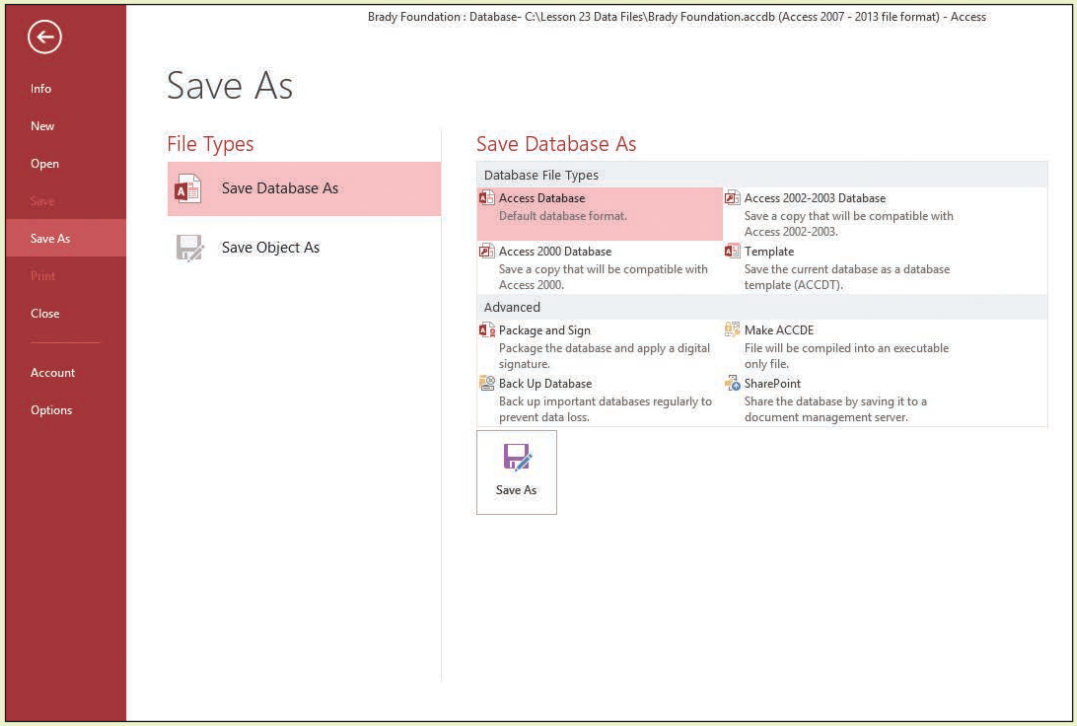


FIGURE 23–6
Save options in Backstage view

5. The current filename *Brady Foundation* with a *1* at the end is already displayed and selected in the *File name* box. Type **Revised Brady Foundation**, followed by your initials. Then navigate to your solution folder. Click **Save**. If a yellow Security Warning message pane appears below the Ribbon, click **Enable Content**.

6. In the Navigation Pane, under *Sponsors*, double-click **Sponsors : Table** to open the Sponsors table. The table shown in **Figure 23–7** opens in the object window, and the Table icon and the table name display on the object tab. Drag the **scroll box** on the horizontal scroll bar (at the bottom of the screen) to view the columns to the right. Then drag the **scroll box** back to the left. This table provides data about companies that currently provide sponsorship for an organization as well as companies that could potentially become sponsors.

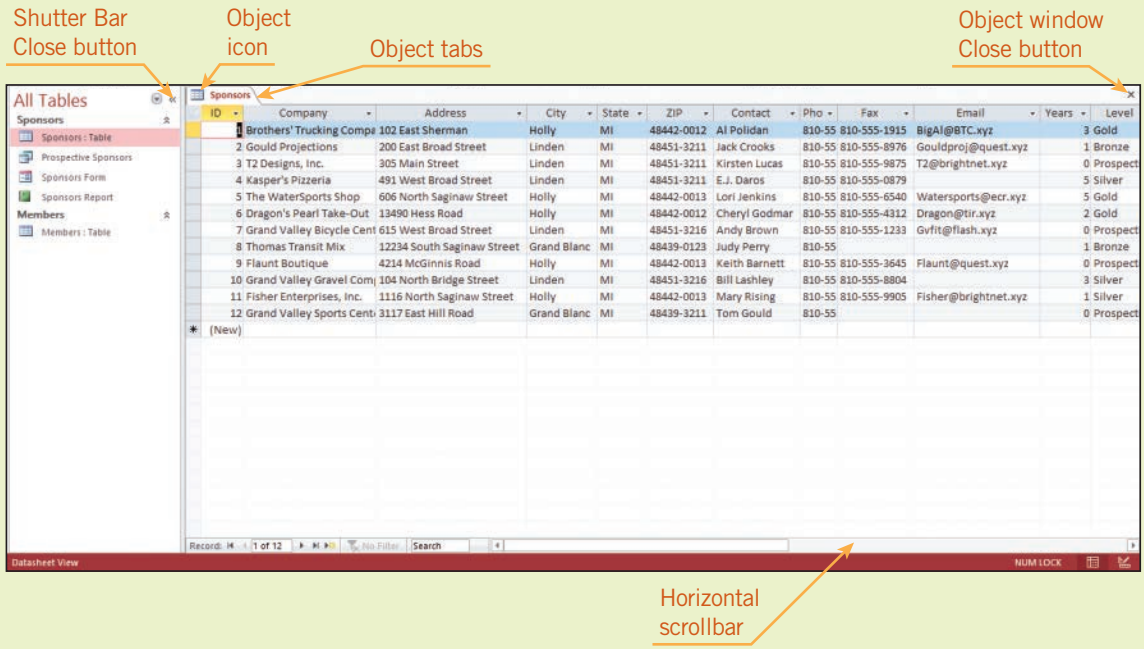


FIGURE 23–7
Sponsors table

7. To allow more space to show the table contents, in the Navigation Pane, click the **Shutter Bar Close** button. The Navigation Pane collapses, as shown in **Figure 23–8**, and you can see more of the table columns. Click the **Shutter Bar Open** button to expand the Navigation Pane and show the objects in the database.

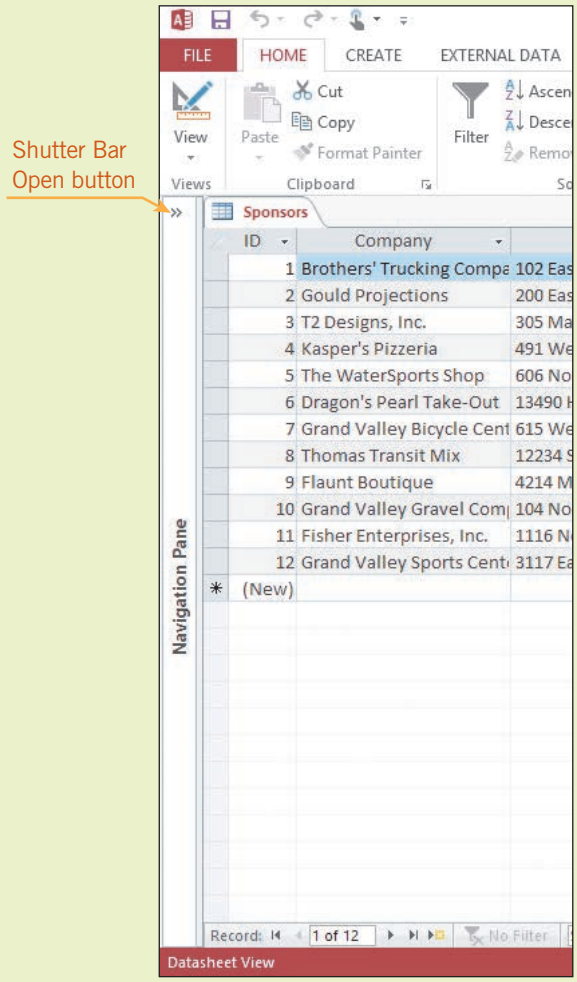


FIGURE 23–8
Collapsed Navigation Pane

8. In the Navigation Pane, under *Members*, double-click **Members : Table**. The Members table opens on top of the Sponsors table and becomes the active table, as shown in **Figure 23–9**. The table icon and the table name are also displayed on the new object tab. In the Object window, click the **Sponsors** object tab to show the *Sponsors* table.

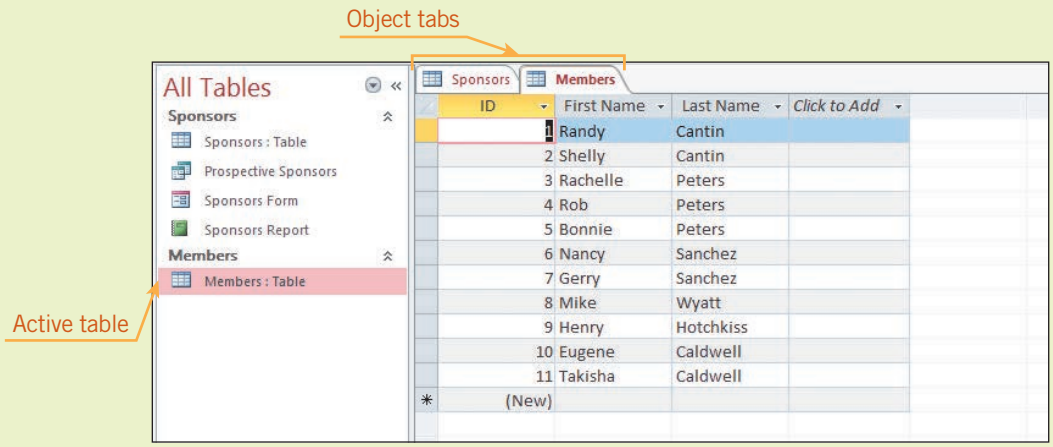


FIGURE 23–9
Members table

9. In the upper-right corner of the object window (not the application window), point to the *Close* button. The ScreenTip displays *Close 'Sponsors.'* Click the **Close** button for the table. The *Sponsors* table closes, but the *Members* table remains open.
10. In the Navigation Pane, under *Sponsors*, double-click **Sponsors Form**. On top of the Members table object, a form object opens and the Form icon  and the form name are also displayed on the new object tab. The form is displayed in Form view, which makes it easy for you to enter data. All data entered in the form is saved in the Sponsors table.
11. In the Navigation Pane, under *Sponsors*, double-click **Prospective Sponsors**, and a query object opens on top of the Sponsors Form object. The Query icon  and the query name are also displayed on the new object tab. This query object finds and shows only the companies that are considered to be prospective sponsors. The information comes from the *Sponsors* table.
12. In the Navigation Pane, under *Sponsors*, double-click **Sponsors Report**. A report object opens on top of the query object and the Report icon and the report name are also displayed on the new object tab. The report shows the data contained in the Sponsors table in a report design.
13. In the object window, click the **Sponsors Form** object tab. Then click the **Prospective Sponsors** object tab. Four objects are open, but you can only work with one object at a time.
14. Click the **FILE** tab, and then click **Close**. The objects and the database are closed. Click the **Close** button in the upper-right corner to close the application.

Creating a New Database

You can create a new database file using a blank database template or by using templates that are predefined with objects already created. In this lesson you will learn to create tables using the Blank desktop database template, and in Lesson 24 you will learn to create reports, forms, and queries. Then when you open a predesigned database template, you will be familiar with all the elements of each type of object, and you will be able to modify and customize the objects as needed.

Saving a Database File and Creating a Table in Datasheet View

VOCABULARY
datasheet

When you create a new database, the first step is to create a table. A table, often referred to as a ***datasheet***, is the primary object in the database. Each of the objects and everything you do in a database relies on the data stored in the tables. Therefore, at least one table must be created before any additional objects can be created. You can create as many tables as you need to store the information.

A database table contains fields and records. A ***field*** is a single piece of database information, such as a first name, a last name, or a telephone number. Fields are displayed as columns, and each column has a ***field name***, which is a label that helps identify the field. When you create a new field, you can choose a ***data type***, which determines the type of data the field can store, such as text or numbers. A ***record*** is a group of related fields in a database, such as all the contact information for an individual, including first and last name, address, postal code, telephone number, and so forth. When you create a table in Access, the default setting creates a primary key for each record, which uniquely identifies each record in the table. The ***primary key*** is useful in sorting records, and it prevents duplicate entries. For example, you may have a student ID number, and no other student has exactly the same number as you.

By default, a table opens in Datasheet view, and the table data is shown in a row-and-column format. In this view, the table looks much like a spreadsheet. One intersection of a row and a column is called a ***cell***, just as in a table or a worksheet. Field names are used for column headings, and each row in the table contains one single record of the entire database.

VOCABULARY

field

field name

data type

record

primary key

cell

Step-by-Step 23.3

1. Start **Access**. In the Template gallery, click the **Blank desktop database** thumbnail. The Blank desktop database dialog box opens. The proposed filename is already selected in the *File Name* box.
2. Type **Customers 1**, followed by your initials. Then to the right of the *File Name* box click the **Browse** button. In the File New Database dialog box, navigate to the folder where you save your solution files, and then click **OK**. The new path is displayed under the *File Name* box.
3. Click the **Create** button. A new database window like the one shown in **Figure 23–10** opens. The TABLE TOOLS FIELDS tab displays on the Ribbon.

IC3
2-1.2.1
2-1.3.2
2-1.3.3
2-5.1.3

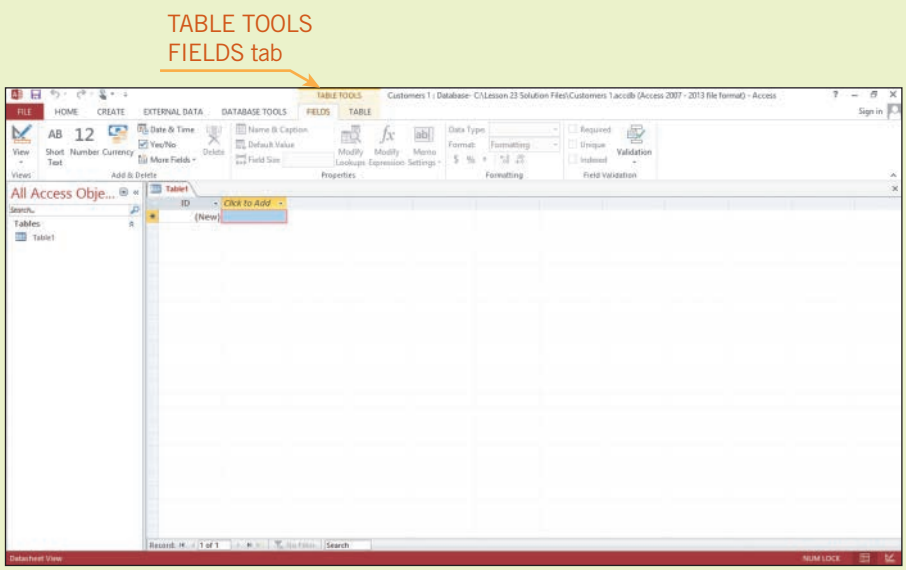


FIGURE 23–10
New database window

4. In the second column of the table, click the **Click to Add** column heading to display the data types menu shown in **Figure 23–11**. Click **Short Text**. The column heading is replaced with the default field name *Field1* and the file name is selected. Type **Last Name** and press **Enter**. The new field name displays in the column heading, the insertion point moves to the first cell in the third column, and the menu of data types is displayed.

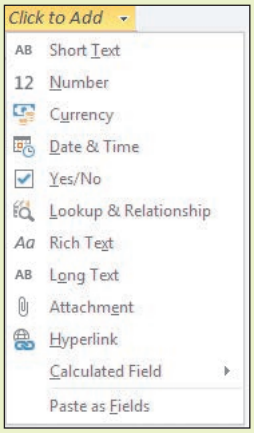


FIGURE 23–11
Data Types menu

5. In the menu, click **Short Text**. Then type **Address**, and press **Enter**. The insertion point moves to the first cell in the fourth column, and the menu with data types is displayed.
6. Continue using the same procedure to enter the following additional field names. Because the postal codes will include a hyphen, which is not considered a number, the data type for that field should also be assigned the Short Text data type instead of the Number data type.

   City
   State/Province
   Postal Code
   Country/Region
7. On the Quick Access Toolbar, click the **Save** button. Because the table has not been assigned a name, the Save As dialog box opens. In the *Table Name* text box, type **Contacts**, and then click **OK**. The new table name appears in the Navigation Pane.
8. To create a second table in the database, on the Ribbon, click the **CREATE** tab. In the Tables group shown in **Figure 23–12**, click the **Table** button. A new table is displayed in the object window on top of the Contact Information table, and the Navigation Pane also shows the new table, which is currently labeled *Table1*.

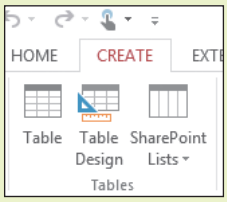


FIGURE 23–12
Tables group on the CREATE tab

9. The Ribbon adapts and now shows the TABLE TOOLS FIELDS tab. In the Add & Delete group shown in **Figure 23–13**, click the **More Fields** button .

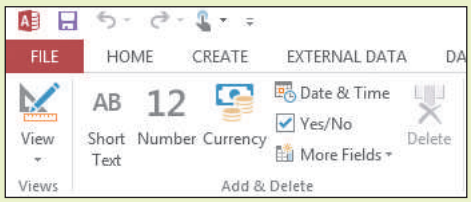


FIGURE 23–13
Add & Delete group on the TABLE TOOLS FIELDS tab

10. A menu opens to show a list of built-in fields. Scroll down to the bottom of the menu to display the options shown in **Figure 23–14**. Under *Quick Start*, click **Name**. The field name *Last Name* is now displayed at the top of the second column, and the field name *First Name* is now displayed at the top of the third column.

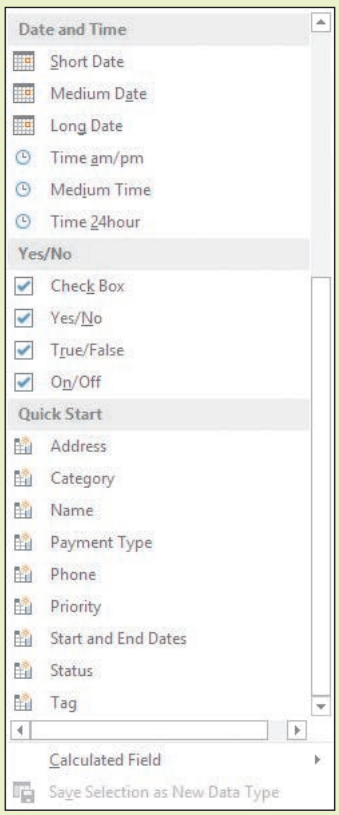


FIGURE 23–14
Menu of built-in fields

11. In the Add & Delete group, click the **Short Text** button. A new text field is added at the top of the fourth column. Type **Item** to replace the default field name *Field1*. Click the **Short Text** button again, and type **Description**. Click the **Short Text** button once more, type **Purchase Price**, and press **Enter**. The new table now has six column headings, including the *ID* column.
12. On the Quick Access Toolbar, click the **Save** button. In the *Table Name* box, type **Orders**, and then click **OK**. The database now has two tables, and both tables are open. In the upper-right corner of the object window for the Orders table, click the **Close** button. Then in the upper-right corner of the object window for the Contacts table, click the **Close** button.
13. Leave the database open for the next Step-by-Step.

Entering Records in Datasheet View

VOCABULARY
entry

When you enter data into a cell, you are making an ***entry***. To move from one cell to another, you can use the mouse to click in a cell, or you can use the keyboard. **Table 23–2** describes the keys you can use to move around in a table in Datasheet view.

TABLE 23–2 Keys for navigating in Datasheet view

KEY	DESCRIPTION
Enter, Tab, or right arrow	Moves the insertion point to the next field
Left arrow or Shift+Tab	Moves the insertion point to the previous field
Home	Moves the insertion point to the first field in the current record
End	Moves the insertion point to the last field in the current record
Up arrow	Moves the insertion point up one record and stays in the same field
Down arrow	Moves the insertion point down one record and stays in the same field
Page Up	Moves the insertion point up one screen
Page Down	Moves the insertion point down one screen

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Step-by-Step 23.4

2-1.3.1
2-1.3.2
2-5.1.3

1. If necessary, open the **Customers 1** database from your solution files. Save the Customers 1 database as **Customers 2**, followed by your initials. If a Security Warning message pane appears below the Ribbon, click **Enable Content**.
2. In the Navigation Pane, under *Tables*, double-click **Contacts** to open the table.
3. To enter the first record, press **Tab** to move to the cell under the field name *Last Name*, and type **McGuirk**. Note that as you create the entry in the *Last Name* field, Access automatically assigns the primary key *1* in the *ID* field.
4. Press **Tab** to move to the next field, and complete the record by entering the following information in the respective fields:

Address:	**610 Brae Burn**
City:	**Mansfield**
State/Province:	**OH**
Postal Code:	**44907-1112**
Country/Region:	**USA**

5. Press **Tab** twice to move to the *Last Name* field in the next row. Enter the following data for two more records. Do not be concerned if the text does not fit within the cell.

Last Name:	**Brown**
Address:	**117 Yorkshire Road**
City:	**Lexington**
State/Province:	**OH**
Postal Code:	**44904–3455**
Country/Region:	**USA**

Last Name:	**Schroeder**
Address:	**4645 Rule Road**
City:	**Bellville**
State/Province:	**OH**
Postal Code:	**44813–3231**
Country/Region:	**USA**

6. On the Quick Access Toolbar, click the **Save** button. All the changes to the database are now saved. Close the table.
7. Leave the database open for the next Step-by-Step.

Modifying a Database Table in Design View

The default column widths are often too wide or too narrow for the data in the table. This is the case with your database. The Address field is not wide enough to show all the text in the street address, and the ID field has extra white space. You can adjust the column widths in a database table just as you adjust the column widths in an Excel spreadsheet.

Adding and Deleting Fields

Often, after you create a table and enter data, you decide you want to add or delete fields. You can add fields in either Datasheet view or Design view. However, Design view provides features that make the task easier. Design view shows details about the structure of the object, including the data type and the field properties. ***Field properties*** define the characteristics and behavior of a field, such as the number of field properties characters allowed.

VOCABULARY
field properties

Step-by-Step 23.5

IC3
2-1.1.9
2-1.2.1
2-1.3.1
2-1.3.2
2-1.3.6
2-5.1.3

1. If necessary, open the **Customers 2** database from your solution files. Save the Customers 2 database as **Customers 3**, followed by your initials. If you see a Security Warning message panel, click **Enable Content**. Open the **Contacts** table.
2. Point to the right border of the cell containing the field name (column heading) *Address*. When the pointer changes to a double-headed arrow ✢, click and then drag the **column border** to the right until the column is wide enough to show the complete entry for all records.
3. Point to the right border of the *ID* column heading. When the pointer changes to a double-headed arrow, double-click and the width of the *ID* column is automatically adjusted for the contents in the column.
4. Position the mouse pointer over the field name *Address*. When the pointer changes to a down arrow ↓, click and drag the pointer to the right to the column heading *Country/Region*. Five columns are now selected. Position the mouse pointer over the right border for the column heading *Country/Region*. When the mouse pointer changes to a double-headed arrow, double-click. The widths for all the selected columns are automatically adjusted for the contents in each column.
5. Click cell **1**, the first cell in the first data row of the table. On the HOME tab, in the Views group, click the **View** button arrow, and then click **Design View**.

QUICK TIP

The upper portion of the View button always shows the icon for an alternative view, which you can click to switch to that view. For example, when you are in Design view, the upper portion of the View button shows the icon for Datasheet view. Clicking the upper portion toggles your view to Datasheet view.

6. The table is displayed in Design view, as shown in **Figure 23–15**. The Ribbon adapts to show the TABLE TOOLS DESIGN tab. In the Tools group, the Primary Key button is highlighted, indicating that the Primary Key field is selected. In the table, the field names are displayed in the first column, and the data type for each field is displayed in the second column. Field properties for the active field are displayed in a pane at the bottom of the window.

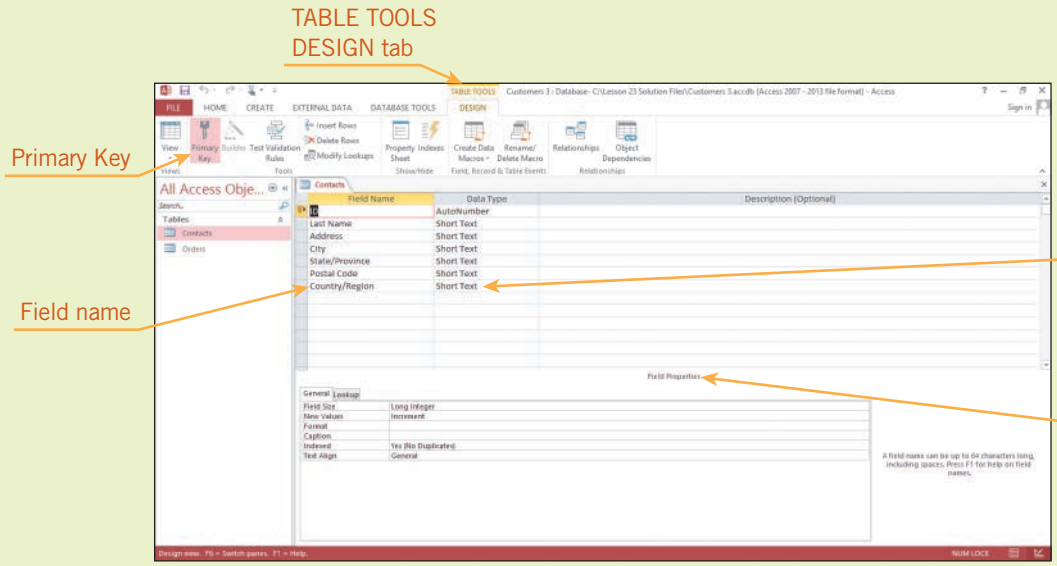


FIGURE 23–15
Contacts table in Design view

7. Position the mouse pointer to the left of the *Country/Region* field name. When a right-pointing arrow appears, click to select the entire row. The TABLE TOOLS DESIGN tab displays as shown in **Figure 23–16**.

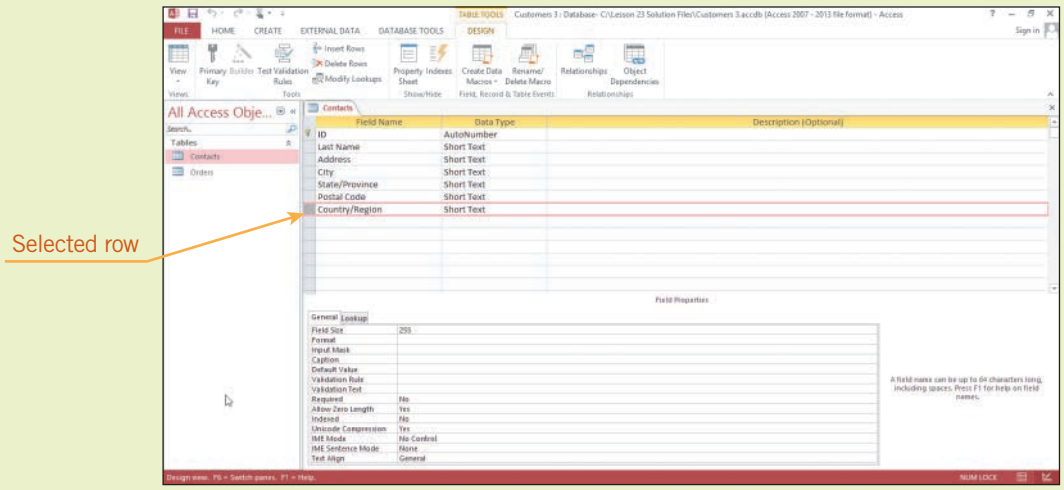


FIGURE 23–16
Selected table row in Design view

8. In the Tools group shown in **Figure 23–17**, click the **Insert Rows** button. Click the **blank cell** directly below the field name *Postal Code*. Type **Email** and press **Enter**. The new field is entered, and the Data Type cell to the right is active and shows the default data type, *Short Text*.

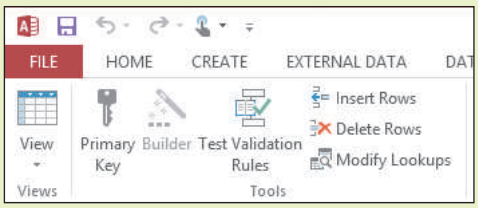


FIGURE 23–17
Tools group on the TABLE TOOLS DESIGN tab

9. Edit the field name *Email* so it reads **E-mail**.
10. Click the blank cell directly below the field name *Country/Region*. Type **Birth Date** and then press **Enter**. The new field is entered, and the Data Type cell to the right is active and shows the default data type, *Short Text*.
11. Select the row for the field name *Last Name*, and click the **Insert Rows** button. In the blank cell above the field name *Last Name*, type **First Name** and then press **Enter**.
12. Select the row containing the *Country/Region* field. In the Tools group, click the **Delete Rows** button. When prompted to permanently delete the selected field and all the data in the field, click **Yes**. The field and all the data entered in the field are removed from the table.
13. Save the changes to the table, and then close the table.
14. Leave the database open for the next Step-by-Step.

Changing Field Data Type and Field Properties

The default data type for a field is Short Text, which is appropriate for most of the fields in the Contacts table. However, for some fields, such as the Birth Date field, you may want to specify a Date/Time data type instead of Short Text. In Design view, you can specify the data type for each field. For example, you can specify Text, Number, Currency, and Yes/No.

When you choose a data type, you can also change the field properties. The field properties available depend on the data type selected. For example, the default Field Size property for the Short Text data type is 255 characters, but you can specify that the field allow up to only 50 characters. Most data types include a Format property. The Format property specifies how you want Access to show numbers, dates, times, and text.

QUICK TIP

The Long Text field stores up to about a gigabyte (GB) of text and you can format Long Text fields to display Rich Text, which displays bold and underline formats.

Step-by-Step 23.6

IC3
2-1.1.9
2-1.2.1
2-1.3.1
2-1.3.2
2-1.3.6
2-5.1.3

1. If necessary, open the **Customers 3** database from your solution files. Save the Customers 3 database as **Customers 4**, followed by your initials. If you see a Security Warning message panel, click **Enable Content**. Open the **Contacts** table.
2. On the HOME tab, in the Views Group, click the **View** button arrow, and then click **Design View**.
3. In the *Birth Date* row, click the **Short Text** data type cell for the field. When the list arrow appears at the right side of the cell, click it to open the list of data type options. Click **Date/Time** to change the data type. The Field Properties pane changes to show the values for the Date/Time data type.
4. In the Field Properties pane, in the first row, click the **Format** property box (the cell to the right of *Format*). When the Format property list arrow is displayed in the empty cell, click it to open the list of Format property options shown in **Figure 23–18**. In the list of options, click **Short Date**.

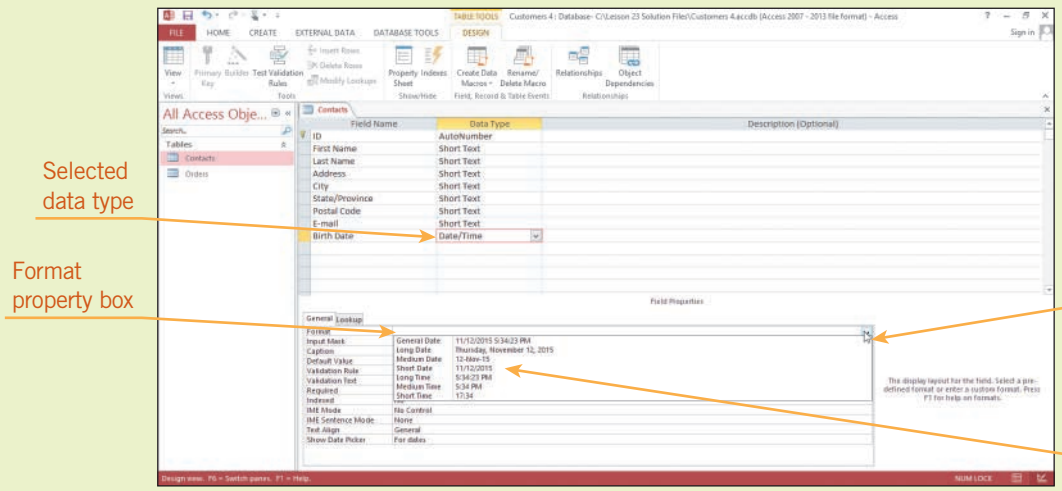


FIGURE 23–18
Date/Time field format property options

5. In the *State/Province* row, click the **Short Text** data type cell for the field. In the Field Properties pane below, click the **Field Size** property box. The field size is currently set at *255*. Change the field size to **2**. This requires that the user use two-letter state abbreviations when entering the state name in the table.
6. Click the **View** button to toggle to Datasheet view. You must save changes to objects before you switch views, so when prompted to save the table, click **Yes**. When prompted that some data may be lost, click **Yes** to continue.
7. Click the **Shutter Bar Close** button to collapse the Navigation Pane.

8. Enter the following data in the *First Name*, *E-mail*, and *Birth Date* fields. As you enter the birth date data, Access automatically formats the date using the short date format you specified in the field properties.

ID	First Name	E-mail	Birth Date
1	**Jaimey**	**jmcguirk@net.xyz**	**March 13, 1982**
2	**Jessie**	**jbrown@lfsc.xyz**	**June 18, 1984**
3	**Matt**	**mschroeder@qry.xyz**	**April 11, 1983**

9. Enter the following new record. Remember that as you enter the state name, Access will not permit you to enter more than two characters. You must enter the two-letter state abbreviation **OH** for Ohio.

First Name:	**Kelsie**
Last Name:	**Erwin**
Address:	**2038 Leiter Road**
City:	**Lucas**
State/Province:	**Ohio**
Postal Code:	**44843–3197**
E-mail:	**kerwin@csfa.xyz**
Birth Date:	**October 6, 1983**

10. Select the **E-mail** and **Birth Date** columns and automatically adjust the column widths. Click one of the entries in the table to deselect the columns.
11. Click the **Shutter Bar Open** button to expand the Navigation Pane.
12. Save the changes to the table and then close the table.
13. Click the **FILE** tab and then click **Close** to close the database. Leave the application open for the next Step-by-Step.

Adding and Editing Database Records

It is common for data to change after you have entered it into your database. For example, people move, so you have to change their addresses. Access provides several navigation features that make it easy for you to move around in a table to make necessary edits. You can hide fields to reduce the amount of data that displays in a table. These features are especially useful when you are working in large databases.

If you make a mistake adding or editing data in a record, you can choose the Undo command to reverse your last action. As soon as you begin editing another record, however, the Undo command is no longer available. That is because Access constantly saves the changes. As you experienced in the previous Step-by-Step, when you make changes in Design view and then switch to Datasheet view without first saving the object, Access prompts you to save the changes. However, when you work in Datasheet view, the changes are saved as they are made. When you switch from Datasheet view to a different view, or when you close the database, you are not prompted to save the changes because they were already saved.

Step-by-Step 23.7

2-1.1.3
2-1.1.5
2-1.1.9
2-1.3.1
2-1.3.2
2-1.3.5
2-5.1.3

1. Open the database **Books** from the drive and folder where your Data Files folder is stored. Save the Books database in your solution folder as **Revised Books 1**, followed by your initials. If you see a Security Warning message panel, click **Enable Content**.
2. Open the **Books** table. A highlight indicates that the first cell in the table (ID number *1*) is the active cell.
3. Position the mouse pointer over the column heading *# Pages*. When the pointer changes to a down arrow, click and drag to select the **# Pages, Publisher**, and **Price** columns. On the HOME tab, in the Records group shown in **Figure 23–19**, click the **More** button and then in the menu click **Hide Fields**. The data in the three selected columns is hidden.

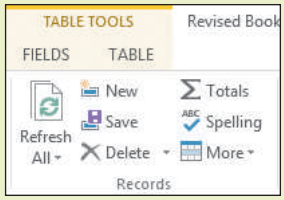


FIGURE 23–19
Records group on the HOME tab

4. Click cell **1**, the first cell in the table. In the Navigation bar, shown at the bottom of the table in **Figure 23–20**, click the **Next record** navigation button. The highlight moves to the ID number *2* in the second row in the table.

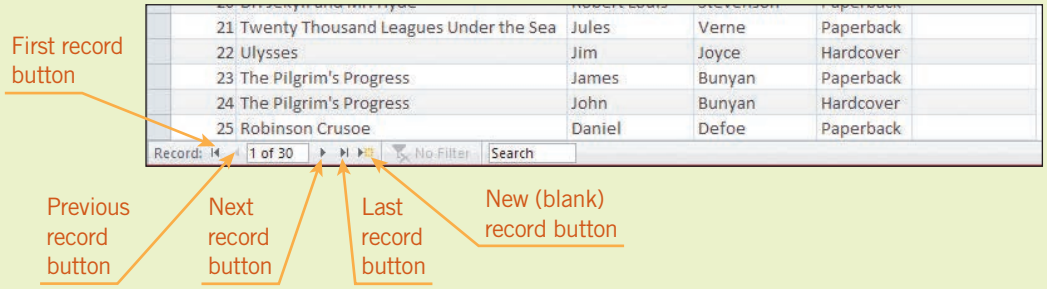
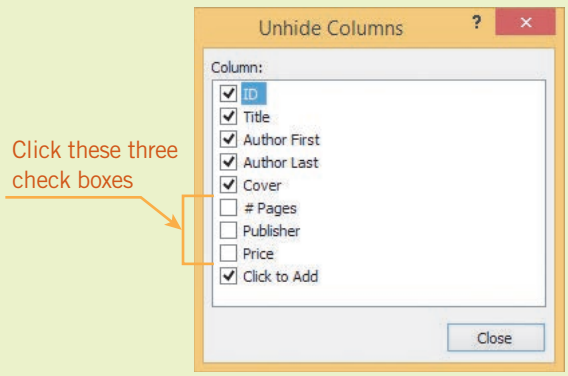


FIGURE 23–20
Navigation bar

5. In the Navigation bar, click the **Previous record** navigation button to move back to ID number *1*. The highlight moves to the first row, and the active cell is still in the *ID* field.
6. In the middle of the navigation buttons, in the *Current Record* number box, select the number **1**, and type **23**. Press **Enter**. The highlight moves to the cell in the *ID* field with the ID number *23*.

7. Click the ID field entry **23**. Press **Tab** twice to move the insertion point to the *Author First* field in the same row. The entry in that cell is selected. Type **John** to change the entry. Note that a pencil (an Edit Record icon) appears at the left edge of the row, indicating the record is being edited.
8. Click the **Next Record** navigation button. The highlight moves to the next row in the *Author First* field, and the entry in that cell is selected. The pencil is no longer displayed to the left of row 23 because when you clicked the Next record navigation button, the edit was completed. When you navigate out of the row, the entry is updated.
9. Click the **First record** navigation button. The insertion point moves to the *Author First* field in the first row in the table.
10. Click the **Last record** navigation button. The insertion point moves to the *Author First* field in the last row in the table.
11. Click the **Previous record** navigation button two times to move up two rows. Press **Tab** two times to move to the *Cover* field in the same row. Type **Paperback** to replace the entry. Press **Shift+Tab** to move to the *Author Last* field.
12. The last change was not necessary, and because you have not navigated out of the row, the changes have not been updated and you can undo the edit. On the Quick Access Toolbar, click the **Undo** button. The action is reversed, and the cell shows *Hardcover*.
13. With the insertion point positioned anywhere in the table, in the Records group, click the **More** button and then click **Unhide Fields**. The Unhide Columns dialog box shown in **Figure 23–21** opens. Click the check boxes for each of the unchecked options: **# Pages, Publisher**, and **Price**. As you click each check box, the column in the table displays. Click the **Close** button in the dialog box.

FIGURE 23–21
Unhide Columns dialog box



14. Save the changes to the table, and then close the table. Leave the database open for the next Step-by-Step.

Deleting and Copying Records and Fields in Datasheet View

Deleting records is similar to deleting rows in an Excel spreadsheet. To delete a record, you must first select the record. You can delete multiple records at the same time by selecting more than one row. However, in a database table, you cannot select non-adjacent cells, rows, or columns. After a record is selected, you can press the Delete key to remove the data. Take care, though. Once you have deleted a record, you cannot use the Undo command to restore it.

Selected data can also be copied or moved from one location in an Access table to a new location within the same table or to a different table. The Cut, Copy, and Paste commands you have used in other Office applications are also available in Access. Access stores cut or copied text in the Clipboard.

To remove a table field and all the data for the field, you delete the column, similar to how you delete a column in Excel. To change the sequence of the fields in the table, you can rearrange the sequence of the columns.

Step-by-Step 23.8

IC3
2-1.1.2
2-1.1.6
2-1.1.9
2-1.3.1
2-1.3.2
2-5.1.3

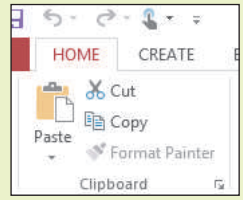
1. If necessary, open the **Revised Books 1** database from your solution files. Save the Revised Books 1 database as **Revised Books 2**, followed by your initials. If you see a Security Warning message panel, click **Enable Content**.
2. Open the **Books** table. Collapse the Navigation Pane. In the group of navigation buttons at the bottom of the table, click the **New (blank) record** button  . The first empty cell in the *ID* field is highlighted.
3. Press **Tab** to move to the *Title* field. Access automatically inserts an ID number for the primary key when you begin to enter data. Enter the following data for the new record. Press **Enter** after you enter the price.

Title:	**Crime and Punishment**
Author First:	**Fyodor**
Author Last:	**Dostoyevsky**
Cover:	**Hardcover**
Pages:	**499**
Publisher:	**HarperCollins Publishers, Inc.**
Price:	**$18.99**

4. Point to the left of the record with the ID field *26* (*Lord Jim*). When the pointer changes to a right-pointing arrow, click to select the entire row.
5. Press **Delete**. When prompted to confirm the deletion of the record, click **Yes**. The record is deleted from the table. Note that the ID numbers for the records below the deleted row do not change.
6. Point to the left of the ID field *27* (*Emma*). When the pointer changes to a right-pointing arrow, click to select the entire row.

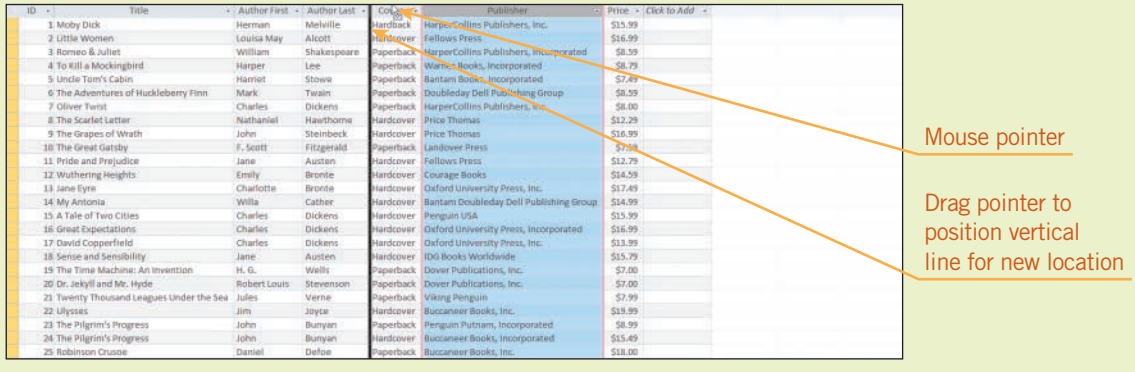
7. In the Clipboard group shown in **Figure 23–22**, click the **Copy** button. Point to the left of the *ID* field in the empty row (*New*) at the bottom of the table. When the pointer changes to a right-pointing arrow, click to select the entire row.

FIGURE 23–22
Clipboard group on the HOME tab



8. In the Clipboard group, click the upper portion of the **Paste** button to paste a copy of record 27 in the new row. Change the title to **Northanger Abbey**, the number of pages to **230**, and the publisher to **Modern Classics Library**. Press **Enter**. The active cell is the *Price* field.
9. If necessary, drag the horizontal scroll box to the left to show the *ID* column. In the record 30 row (*The Hunchback of Notre-Dame*), double-click the *Cover* field entry **Paperback**, and then press **Ctrl+C** to copy the entry.
10. In the new *Northanger Abbey* record row, double-click the *Cover* field entry **Hardcover**, and then press **Ctrl+V** to replace the entry with the data on the Clipboard (*Paperback*).
11. Position the mouse pointer over the field name *# Pages*. When the pointer changes to a down-pointing arrow, click to select the entire column.
12. Click the **TABLE TOOLS FIELDS** tab. In the Add & Delete group, click the **Delete** button. When prompted to permanently delete the fields and data, click **Yes**.
13. Select the **Publisher** column. Click and drag the **column heading** to the left. When the black vertical border shown in **Figure 23–23** appears to the left of the *Cover* column, release the mouse button. The *Publisher* column is repositioned and now appears before the *Cover* column.

FIGURE 23–23
Repositioning a table column



14. Expand the Navigation Pane. Save the changes to the table, and then close the database.

TECHNOLOGY CAREERS

Database Security

Protecting data is more important than ever, and securing database systems is taken very seriously as networks are progressively opened to wider access, especially access to the Internet. Hackers are not just attacking large corporations to steal information such as credit card numbers. They are also attacking smaller organizations and accessing sensitive data such as financial transactions, medical records, and Social Security numbers.

To protect against such compromises, companies of all sizes depend upon several levels of security controls to protect the network, host, and applications used to store data. Specialists in implementing security measures are needed for the software development process as well as on an ongoing basis to anticipate and safeguard against threats.

SUMMARY



In this lesson, you learned:

- Many parts of the Access screen are similar to other Office 2013 applications. However, Access also has different views to perform tasks unique to Access.
- You can customize the Access application settings to fit your needs.
- A database can have multiple tables, and all other objects are based on data stored in tables.
- A table can be modified after it is created, and you can add or delete fields in the table even after records have been entered. You can modify a table in Datasheet view or in Design view.
- You can easily switch between Design view and Datasheet view.
- In Design view, you can specify the data type and properties for each field. The field properties control the characteristics and behavior of a database field, such as the maximum number of characters.
- Access provides several navigation features that make it easy for you to move around in a table to make necessary edits. If you are working in a large database, you can hide fields to reduce the amount of data that displays in a table.
- Deleting records is similar to deleting rows in Excel. Once you have deleted a record, you cannot use the Undo command to restore it.
- Selected data can be copied or moved from one location to another in an Access table, or to another table, using the Cut, Copy, and Paste commands.
- To change the sequence of fields in a table, you rearrange the sequence of columns.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. You must save changes and close a table before switching views.

T F 2. You can work with as many as four objects at the same time.

T F 3. Once you navigate to another record, the Undo command is no longer available.

T F 4. By default, a table opens in Datasheet view.

T F 5. You can drag and drop columns in a database table.

MULTIPLE CHOICE

Select the best response for each of the following statements.

1. _____ view shows details about the structure of the object.
   A. Datasheet C. Table
   B. Design D. Normal
2. A _____ is a group of related fields, such as all the personal information about an employee.
   A. record C. column
   B. row D. field
3. The _____ helps identify the field.
   A. primary key C. data type
   B. field name D. none of the above
4. The _____ object organizes data in a specific layout.
   A. Table C. Report
   B. Form D. Query
5. The _____ object makes it easy for you to view, enter, and edit data in a table.
   A. Table C. Report
   B. Form D. Query

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. A(n) _____ is the primary object in a database.
2. A(n) _____ uniquely identifies each record in a table.
3. The _____ determine(s) the type of data a database field can store.
4. A(n) _____ is a single piece of database information.
5. When you create a new database, the first step is to create a(n) _____.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What are the similarities and differences of Excel spreadsheets and Access databases?

2. What is a relational database management system?

3. What is the primary object in a database, and why?

4. What is the purpose of the primary key?

5. What are the advantages to switching to Design view before adding and deleting fields?

PROJECTS

PROJECT 23–1

IC3 2-1.1.9 2-1.2.1 2-1.3.1 2-1.3.2 2-5.1.3

1. Open the **Movies** database from the drive and folder where your Data Files folder is stored. Save the Movies database as **Revised Movies 1**, followed by your initials. If necessary, enable the content. This database stores membership information and the current video collection of the Oak Creek Film Society (OCFS), a club for lovers of classic movies. This database contains two tables: Collection and Members.
2. Open the **Collection** table to see the movies the OCFS has collected so far, and then close the table. Open the **Members** table to preview the members of the club, and then close the table.
3. Create a new table for the database to store information on special events that the OCFS sponsors. Add the following fields to the new table in this order: **Title, Location, Start Time, End Time**, and **Description**. Use the **Short Text** data type for all the fields.
4. Save the table with the name **Events**.
5. In Datasheet view, enter the following data:

Title	Location	Start Time	End Time	Event Description
Holiday Classics	**Odeon Theatre**	**12/15/2016**	**12/16/2016**	**Christmas theme**
Horror Classics	**Odeon Theatre**	**1/17/2017**	**1/19/2017**	**Horror theme**
Hitchcock Classics	**Odeon Theatre**	**2/23/2017**	**2/24/2017**	**Suspense theme**

6. Automatically adjust the column widths for the first six columns so complete entries are shown in all columns.
7. Save the changes to the table, and close the table. Leave the database open.

PROJECT 23–2

IC3 2-1.1.9 2-1.2.1 2-1.3.1 2-1.3.2 2-1.3.6 2-5.1.3

1. If necessary, open the **Revised Movies 1** database from your solution files. Save the Revised Movies 1 database as **Revised Movies 2**, followed by your initials. If necessary, enable the content.
2. Open the **Events** table. Switch to Design view. Change the field name *Title* to **Event**. Edit the two field names *Start Time* and *End Time* to read as **Start Date** and **End Date**.
3. Delete the *Description* field and all data in the field.
4. Insert a new field following the *End Date* field named **Start Time** using the **Date/Time** data type. Set the Format property for the new field to **Medium Time**.
5. Insert a new field above the *Start Date* field, and name the new field **Movies** using the Short Text data type. Change the Field Size property for the new field to **200**.
6. Switch to Datasheet view. Insert the following data in the new fields:

Event	Movies	Start Time
Holiday	**A Christmas**	**7:30 pm**
Classics	**Carol**	
Horror	**Frankenstein**	**7:45 pm**
Classics		
Hitchcock	**Vertigo**	**7:30 pm**

Insert the following new record:

Event:	**Spoofing the Classics**
Location:	**Odeon Theatre**
Movies:	**The Pink Panther**
Start Date:	**3/15/2017**
End Date:	**3/17/2017**
Start Time:	**4:15 pm**

7. Adjust the column widths to show all entries in the fields.
8. Save the changes to the table, and then close the table. Leave the database open for the next Project.

PROJECT 23–3

1. If necessary, open the **Revised Movies 2** database from your solution files. Save the Revised Movies 2 database as **Revised Movies 3**, followed by your initials. If necessary, enable the content.
2. Open the **Collection** table. Adjust the width of the columns to show the complete entry for all records.
3. Collapse the Navigation Pane.
4. Go to record 24 (The Haunting). Change the title to **The Haunting of Hill House**. Press **Enter**.
5. Your original title was correct. Undo the edit to restore the original title *The Haunting*.
6. Add two new movies that were acquired for recent events. Enter the data below.

Title:	**Vertigo**
Year:	**1958**
Length:	**128 m**
MPAA:	**NR**
Color/BW:	**Color**
Director:	**Hitchcock**
Category:	**Suspense**
Actor:	**James Stewart**
Actress:	**Kim Novak**

Title:	**Dr. Strangelove**
Year:	**1964**
Length:	**93 m**
MPAA:	**NR**
Color/BW:	**BW**
Director:	**Kubrick**
Category:	**Comedy**
Actor:	**Peter Sellers, George C. Scott**

7. Copy record 29 (Star Wars), and paste it in a new record. Change the title to **The Empire Strikes Back**, the year to **1980**, the length to **124 m**, and the director to **Kershner**. In the Actor field, replace Alec Guinness with **Billy Dee Williams**. Replace the existing entry in the Award field with **Sound**.
8. You have discovered that the 1969 version of Hamlet (record 14) is damaged. Delete this record from the table.
9. Expand the Navigation Pane.
10. Save the changes to the table, close the table, and then close the database.

TEAMWORK PROJECT

Databases are ideal for storing statistics such as those of sports teams. With a partner, create a database to record statistics for a sports team. Follow these steps:

1. With your teammate, choose a sports team for further study.
2. Determine the categories of statistics you need to gather for your database, such as players' names, number of games completed in the current season, scores, and individual or team statistics for each game. Divide up the categories so you share the responsibility for gathering the data.
3. Create a database table with appropriate field names and data types to store the data you collect. Save the database as **TP 23–1**, followed by your initials.
4. Enter the collected data, and save the changes to the table.

CRITICAL THINKING

CRITICAL THINKING 23–1

If possible, look at two applications on computer screens, side by side. Open an Access table in Datasheet view, and then open an Excel worksheet. If you cannot look at the applications on two computers, side by side, open both applications on the same computer and restore down both application windows so you can position the windows side by side.

Compare the two application windows.

1. Create a new Word document, and save the document as **CT 23–1**, followed by your initials.
2. Create two lists—one to describe at least three similarities and one to describe at least three differences in the applications.
3. Save the changes, and close the Word document.

CRITICAL THINKING 23–2

IC3
2-1.2.1

A good database design is essential for entering data efficiently, consistently, and accurately.

1. Create a new Word document, and save the document as **CT 23–2**, followed by your initials.
2. Write a brief paragraph describing how design elements such as the arrangement of fields, field names, and data types can make it easier to enter data and to ensure consistency for the data entered.
3. Save the changes, and close the Word document.

ONLINE DISCOVERY

Contact information generally includes postal codes. If you mail a letter or a package without a postal code, the item must be manually sorted at the post office, and the delivery of the item can be delayed by several days. Furthermore, if the data for the postal code is incorrect, mailed documents and packages may be returned as undeliverable. So, how can you find a postal code or verify that the postal code you have in your record is correct? The United States Postal Service provides an online zip code lookup feature. You can search for zip codes by address, city, or company. You can also search for a list of all the zip codes within a city. The search results can verify a correct address and zip code, and the proper standard postal format for the address is also provided.

1. Create a new Word document, and save the document as **OD 23–1**, followed by your initials.
2. Open your Web browser, and go to www.usps.com.
3. Navigate to the Look Up a ZIP Code feature, and find the zip code for the following address, and then enter the address with the correct zip code in the Word document.

   892 Hickory Drive
   Marysville, OH
4. Verify the zip code for the following company address. In the Word document, enter the address with the correct zip code in the standardized format.

   Cengage Learning
   20 Channel Center Street
   Boston, MA 02300-3401
5. Save the changes, and close the Word document and the Web browser.

JOB SKILLS

Job skills are critical for success in the workplace. To prepare for the work environment and move forward in your career, you must identify and assess the skills you have, and then set goals for further developing your personal values. Developing and maintaining job skills is an ongoing process.

1. Create a new Word document, and save the document as **JS 23–1**, followed by your initials.
2. Create a list of the skills and personal values you currently possess, and then create a second list of the skills you need to learn or further develop. The skills provided below can be used as a guide to get you started, but you can also discuss this topic with classmates and include skills and values not included here:
   - Communication skills (listening, oral, and written)
   - Critical thinking and problem-solving skills
   - Computer or technical literacy skills
   - Teamwork and collaboration skills
   - Leadership skills
   - Time management skills
3. Save the changes, and close the Word document.

EXPLORE AND SOLVE

You must have an Internet connection to complete this activity.

As you learned in this lesson, Access automatically assigns filenames. There is a default setting for the path for where a new database file is saved. Search the Help screens to determine how to change the default database folder so that when you create a new database file you don't have to specify the path for your solutions folder.

If you are using a public computer, such as computer in a lab, do not make any changes to the settings on your computer.

1. Create a new Word document, and save the document as **ES 23–1**, followed by your initials.
2. Describe how to change the default database folder.
3. Save the changes and close the document.

IC³
2-1.1.7
2-1.1.8



Estimated Time:
1.5 hours

LESSON 24

Managing and Reporting Database Information

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Create a form using the Form button and using the Form Wizard.
- Enter and edit data in a form.
- Sort table data in Datasheet view.
- Find and replace table data in Datasheet view.
- Create a query using the Query Wizard.
- Create a report using the Report Wizard.
- Preview and print a report.
- Create mailing labels using the Label Wizard.

WORDS TO KNOW

form

query

report

DATA FILES

To complete this lesson, you will need these data files:

Book Club.accdb

Dixon Logo.jpg

GO Construction.accdb

RCC Logo.jpg

Riverside.accdb

Microsoft product screenshots used with permission from Microsoft Corporation.

As the amount of data in a database increases, it becomes more difficult to manage records and find information. Access has several useful features that help you work with larger databases. These features help you enter the data, order the data, find the data, and summarize and report the data.

Creating a Form

VOCABULARY
form

In the previous lesson, you entered data in an Access table. You can create a ***form***, a database object that provides a more convenient way to enter and edit data. A well-designed form can also make the process of entering data more efficient and more accurate. When you create a form, you add a new object to the database. Access offers two features that make the process quick and easy: the Form button and the Form Wizard.

Creating a Form Using the Form Button

You can create a form with a single click using the Form button. All the fields from the table or query are included on the form, and the form is predesigned. You can apply built-in designs, and if desired, you can modify the form layout and design using either Layout view or Design view.

Step-by-Step 24.1

IC3
2-1.2.1
2-1.2.2
2-1.3.6

QUICK TIP

Note that the Book Club database is similar to, but not exactly the same as, the database file "Books" that you worked with in the previous lesson.

1. Start **Access**. Open the database **Book Club** from the drive and folder where your Data Files folder is stored. Save the Book Club database as **Updated Book Club 1**, followed by your initials. (Throughout this lesson, if you see a yellow Security Warning message panel, click **Enable Content**.)
2. In the Navigation Pane, double-click **Book List : Table** to open the table. Review the table data and then close the table. Double-click **Officers : Table** to open the table. Review the table data and then close the table.
3. In the Navigation Pane, click **Book List : Table** to select the object. (You select the table because you want to base the form on the table.) On the Ribbon, click the **CREATE** tab. In the Forms group shown in **Figure 24–1**, click the **Form** button.

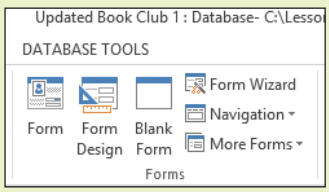


FIGURE 24–1
Forms group on the CREATE tab

4. The form shown in **Figure 24–2** is displayed. The form displays in Layout view, and the Ribbon shows the FORM LAYOUT TOOLS DESIGN tab. Labels identify all the fields included in the table, and the fields display in the same sequence they display in the table. Text boxes in the form show the field data for the first record in the *Book List* table.

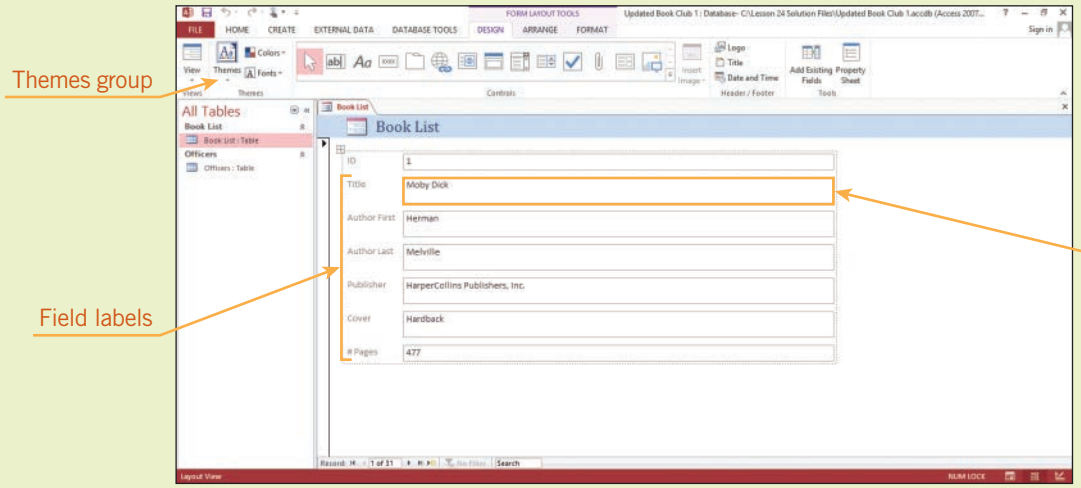


FIGURE 24–2
A pre-designed form created with the Form command

5. In the Themes group, click the **Themes** button. A gallery of several predesigned formats appears. Under *Office*, click the **Wisp** style (the first and only option in the third row). You will notice changes in the colors and font styles. This theme applies only to the form; the table style remains unchanged.

6. In the Object window, click the **Title** text box to select the text box. Click the **FORM LAYOUT TOOLS FORMAT** tab. In the Font group shown in **Figure 24–3**, click the **Font Color** button arrow. In the menu, in the first row of colors under *Theme Colors*, click the **Dark Red, Accent 1** color (fifth column). As you enter the title for each record, the text appears in red, but only on the form. The formats applied to the font have no effect on the data stored in the *Book List* table.

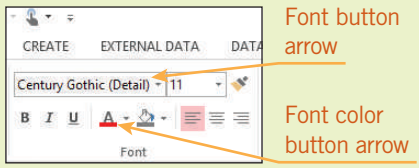


FIGURE 24–3
Font group on the FORM LAYOUT TOOLS FORMAT tab

7. Click the **Author First** text box. Click the **Font Color** button arrow. In the first row of colors under *Theme Colors*, click the **Olive Green, Accent 4** color (eighth column).

8. The *Author First* text box should still be selected. In the Font group, click the **Font** list arrow, and in the list of font styles, click **Arial**. Click the **Font Size** list arrow, and then click **12**.

9. The *Author First* text box is still selected. In the Font group, double-click the **Format Painter** button. Then, click the text boxes for the *Author Last, Publisher, Cover*, and *# Pages* fields to apply the new font formats to each of those text boxes.

10. Click the **Format Painter** button (or press **Esc**) to toggle off the Format Painter mode.
11. On the Quick Access Toolbar, click the **Save** button. The Save As dialog box opens. In the *Form Name* text box, type **Book Form**, and then click **OK**. The new form appears in the Navigation Pane under *Book List : Table*.
12. Close the form, and then close the database. Leave Access open for the next Step-by-Step.

Creating a Form Using the Form Wizard

You may not always want to include all the database fields on the form. To illustrate, consider the following scenario. You are working with a vendor database that includes contact information as well as data about past purchases, billings, and payments. You want to create a form to add new vendors to the database. You want the form to include only the fields related to contact information. The Form Wizard makes it easy to create a form with your preferences because it prompts you to select the fields and the form layout for the new form.

When you work with a form, you have three options for viewing the object. **Table 24–1** describes the three options.

TABLE 24–1 View Options for Working with Forms

VIEW	DESCRIPTION
Form	Used for adding, editing, and viewing data.
Layout	Enables you to make changes to the font styles and colors and predesigned themes. In this view, data appears, so you can see how the changes you make will look when you open the form in Form view.
Design	Provides a detailed view of the structure of the form, and you can use this view to change the properties and add new fields.

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Step-by-Step 24.2

IC3
2-1.2.1
2-1.3.6

1. Open the database **GO Construction** from the drive and folder where your Data Files folder is stored. Save the GO Construction database as **Updated GO Construction 1**, followed by your initials.
2. Open the **Vendors** table. Scroll through the table to view the data stored in the table. Leave the table open.

3. Click the **CREATE** tab. In the Forms group, click the **Form Wizard** button. The Form Wizard dialog box shown in **Figure 24–4** opens. Under *Table/Queries*, *Table: Vendors* is already selected. This indicates that the form will be based on the Vendors table. Also note that under *Available fields*, all the fields that are available in the Vendors table are listed.

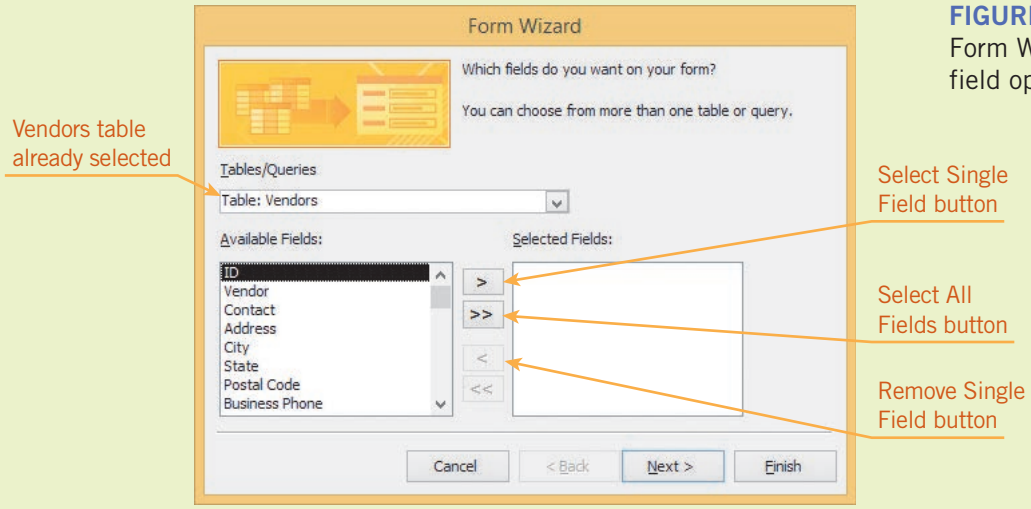


FIGURE 24–4
Form Wizard dialog box with field options

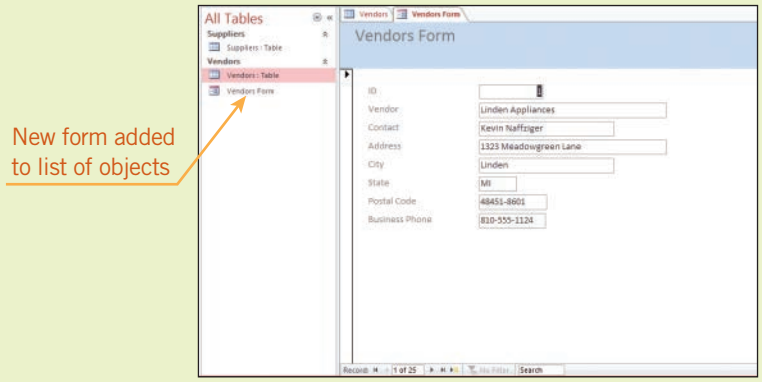
4. You need to identify the fields you want to appear on the form. Between the *Available Fields* pane and the *Selected Fields* pane, click the **Select All Fields** button >>. All of the field names are moved to the Selected Fields pane. All the fields in the table will be included in the form.
5. You decide you do not want the Account Balance and the Last Purchase fields to appear on the form. In the *Selected Fields* pane, click **Account Balance** to select the field name. Then click the **Remove Single Field** button < to remove the field from the list.
6. In the *Selected Fields* pane, the field name *Last Purchase* is already selected. Click the **Remove Single Field** button to remove that field from the list.
7. Click **Next** to advance to the next step in the wizard. The new Form Wizard dialog box prompts you to select a layout for the form. Select each of the layout options to preview each layout. Then select the **Columnar** layout option, and click **Next** to advance to the final step in the wizard.
8. The Form Wizard dialog box prompts you to create a name for the form. A proposed title appears in the text box. Edit the proposed form name so it is **Vendors Form**.
9. The option to *Open the form to view or enter information*. is already enabled. Note that you can choose to modify the form's design. Click **Finish**. The new form is displayed in Form view.

QUICK TIP

When you enable the Modify the form's design option, the new form opens in Design view.

10. Compare your screen to **Figure 24–5**. Data from the first record in the Vendors table is displayed in the form text boxes. Notice, too, the new form object appears in the Navigation Pane under the *Vendors : Table*.

FIGURE 24–5
Vendors Form in Form view



11. In the Views group, click the **View** button arrow, and then click **Layout View**. The Layout of the form does not change, but the Ribbon adapts and the FORM LAYOUT TOOLS FORMAT tab displays so that you can change the formats.
12. Click the **HOME** tab. Click the **View** button arrow, and then click **Design View**. In this view you can add fields and change the property settings.
13. Click the upper portion of the **View** button to toggle back to Form view.
14. Close the form and the table. Leave the database open for the next Step-by-Step.

Entering and Editing Data in a Form

Entering data in a form is similar to entering data in a table in Datasheet view. On the keyboard, you can use the Tab key and the arrow keys to move the insertion point among the fields. Furthermore, the same navigation buttons are available at the bottom of the form.

Not only can you enter new data in Form view, but you can also edit existing data. If the related table is open when you enter new records in Form view, you must refresh the table data before the new records appear. When you edit an existing record in Form view, Access automatically updates the records in the table.

Step-by-Step 24.3

IC3 2-5.1.3

1. If necessary, open the **Updated GO Construction 1** database from your solution files. Save the Updated GO Construction 1 database as **Updated GO Construction 2**, followed by your initials.
2. Open the **Vendors** table, and then open the **Vendors** form. In the Navigation bar at the bottom of the form, click the **New (blank) record** button. A new record opens with labels, but no data displays in the text boxes.

3. Press **Tab** to position the insertion point in the text box for the *Vendor* field. Access will assign an ID number when you begin to enter data. Type **Roy's Refrigerator Repair**. Note that the Edit Record icon is displayed at the upper-left corner of the form, indicating that you are editing the record.
4. Press **Tab**, and type **Roy Fowler**. Press **Tab**, and enter the following information into the form:

Address:	**2531 Owen Road**
City:	**Fenton**
State/province:	**MI**
Postal code:	**48430-2082**
Business phone:	**810-555-6609**

5. Note that the Edit icon still displays in the upper-left corner of the form. Press **Tab** (or **Enter**). The new record is saved and a new blank form opens.
6. Click the **Vendors** object tab to view the Vendors table. Scroll to the bottom of the table. Notice the table has not yet been updated, and the new record does not appear. On the HOME tab, in the Records group, shown in **Figure 24–6**, click the **Refresh All** button. The table is updated. Scroll down to view the new record at the bottom of the table.

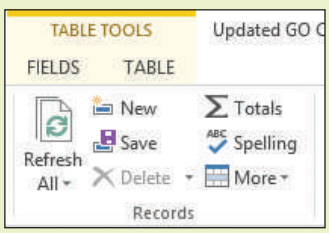


FIGURE 24–6
Records group on the HOME tab

7. Click the **Vendors Form** object tab. In the Navigation bar at the bottom of the form, triple-click in the *Record Number* box to select **27 of 27**. Type **8**, and press **Enter**. A form containing the data record #8 is displayed.
8. The contact person has changed. Click the text box for the *Contact* field, and edit the data so it is **Randy Gilbert**. Press **Enter**. Note that the Edit icon still displays.
9. In the Navigation bar at the bottom of the form, in the *Search* text box, type **Roy Fowler**. The revised data is saved and the form displays the data for Roy Fowler.
10. Click the **Vendors** object tab to view the Vendors table. Navigate to record 8. Note that the name in the *Contact* field has been updated and now shows *Randy Gilbert*.
11. Save the changes, and close the table. Close the form, and leave the database open for the next Step-by-Step.

Sorting Table Data in Datasheet View

Databases typically contain numerous records. Organizing records in a specific order can help you access the data more quickly. You can sort text and numbers in either ascending or descending order. As you may recall, ascending order sorts alphabetically from A to Z and numerically from the lowest to the highest number. Descending order sorts alphabetically from Z to A and numerically from the highest to the lowest number.

If you change your mind after sorting the table data, you can use the Undo command to undo the action. You can also easily restore the table to its original arrangement.

Step-by-Step 24.4

IC3
2-1.1.9
2-1.3.1

1. If necessary, open the **Updated GO Construction 2** database from your solution files. Save the Updated GO Construction 2 database as **Updated GO Construction 3**, followed by your initials.
2. Open the **Vendors** table. Click any record in the *City* column. On the HOME tab, in the Sort & Filter group shown in **Figure 24–7**, click the **Ascending** button. The records in the table are rearranged and placed in alphabetical order from *A* to *Z* by city. A vertical arrow displays in the column label indicating the data is sorted.

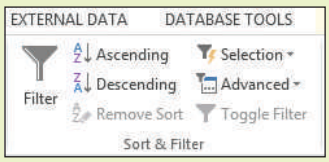


FIGURE 24–7
Sort & Filter group on the HOME tab

3. Scroll to the right, and click any record in the *Account Balance* column. In the Sort & Filter group, click the **Descending** button. The records are rearranged and placed in numerical order with the largest account balance listed first.
4. If necessary, scroll further to the right, and click any record in the *Last Purchase* column. Click the **Descending** button. The records are re-arranged in numerical order with the most-recent purchase listed first.
5. On the Quick Access Toolbar, click the **Undo** button. The records are restored to the arrangement prior to the last sort.
6. Click any record in the *Postal Code* column and then click the **Ascending** button.
7. In the Sort & Filter group, click the **Remove Sort** button. All sorts are cleared, and the records are restored to the original order.

8. Scroll back to the left, and click any record in the *Vendor* column. Click the **Ascending** button. The records are rearranged and placed in alphabetical order from *A* to *Z*.
9. Save the changes to the table and then close the table. Click the **FILE** tab and then click **Close** to close the database without closing the Access application.

Finding and Replacing Table Data

Sometimes, records contain common data, and that data needs to be updated. In a small database, you can locate specific data by scrolling through the records. However, if the database is quite large, finding a particular record or value can be tedious and time consuming. Whether the database has a few records, hundreds of records, or even thousands of records, using the Find and Replace commands simplifies the task.

Finding Data

Assume you want to see if there are any books about Huckleberry Finn included in the Book Club database that you worked with in Step-by-Step 24.1. You could sort the records in the Book List table in alphabetical order by title and then scroll down through the list to look for the title. However, if the database had hundreds or thousands of records, scrolling through the records to find the title could take a lot of time. The Find command provides a quick and easy way for you to locate specific records or find certain values within fields. You can search for data within a specific field, or you can search the entire table.

Step-by-Step 24.5

1. Open the **Updated Book Club 1** database from your solution files.
2. Open the **Book List** table.
3. Position the insertion point in the first row in the *Title* column. Be careful, though, not to select any text in the cell. In the Find group on the HOME tab shown in **Figure 24–8**, click the **Find** button.

IC3
2-1.1.1
2-1.1.5
2-1.3.5

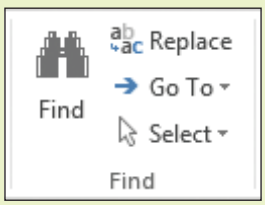
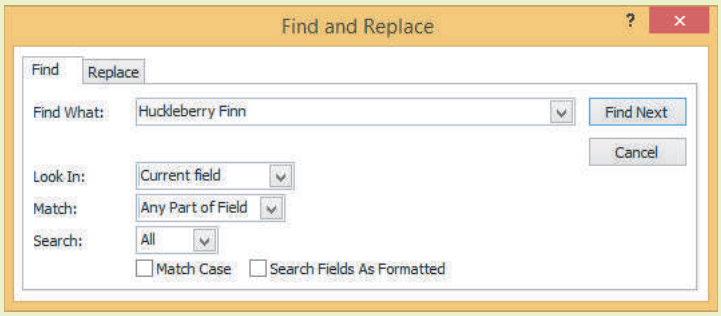


FIGURE 24–8
Find group on the HOME tab

4. The Find tab in the Find and Replace dialog box shown in **Figure 24–9** opens. With the insertion point already positioned in the *Find What* text box, type **Huckleberry Finn**. If there is already text in the box, it will be replaced when you enter the new search text.

FIGURE 24–9
Find tab in Find and Replace dialog box



5. Compare your screen to Figure 24–9. Change the options, if necessary, to match the following:
   a. The setting in the *Look In* box already displays *Current field*. This option is correct as is. It tells Access to look for all occurrences in the field where the insertion point is positioned. (To search the entire table, you would click the list arrow and select Current document.)
   b. If necessary, click the **Match** box list arrow, and select **Any Part of Field**. Access will locate any book title that has the words Huckleberry and Finn in it.
   c. If necessary, select **All** in the *Search* box.
   d. The *Match Case* and the *Search Fields As Formatted* options should not be selected. If they are selected, click the option once to uncheck the box and disable the option. When these options are turned off, Access ignores capitalization and data formats when searching for matching text.
6. When the settings in your dialog box match those in the Figure 24–9, click **Find Next**. The first occurrence of the search text is highlighted in the *Title* column for record #6.
7. Click **Find Next** again. A message is displayed indicating that there are no more occurrences of the search text. Click **OK** in the message box to close the message. Leave the Find and Replace dialog box open.
8. In the Find and Replace dialog box, the text in the *Find What* box is already selected. Type **Dickens**. Then click the **Look In** box list arrow, and select **Current document**. Click **Find Next**. The first occurrence of the search text is selected in the *Author Last* column for record #7.
9. Click **Find Next**. The second occurrence of the search text is selected in the *Author Last* column for record #15.

10. Continue to click **Find Next** to see all remaining occurrences of the search text (two more records). When the message appears indicating there are no more occurrences of the search text, click **OK**. Then close the Find and Replace dialog box.
11. Press **Shift+F4**. Even though the Find and Replace dialog box is closed, the keyboard shortcut used the search criteria from the previous search and located the first occurrence in record #7.
12. Press **Ctrl+F** to open the Find tab in the Find and Replace dialog box. The previous search text is already highlighted in the *Find What* box. Type **Bronte**. Click the **Search** box list arrow, and then click **Up**. Click **Find Next**. Because there are no occurrences of Bronte above record #7, a message appears indicating the search item was not found. Click **OK**.
13. Click the **Search** box list arrow, and then click **Down**. Click **Find Next**. The first occurrence of Bronte moving downward in the table is selected (record #12). Close the dialog box.
14. Close the *Book List* table, and leave the database open for the next Step-by-Step.

Using the Replace Command

The Replace command locates the search text and replaces it with new text that you specify. For example, in the Classics field in the Book Club database, there is no consistency in the spelling of the word "Incorporated." Sometimes it is spelled out completely, and sometimes the abbreviation "Inc." appears. You can search for all the occurrences when the word is abbreviated and then automatically replace those abbreviations with the complete spelling, or vice versa.

When you use the Replace command, you can choose to view and confirm each replacement individually. If you change your mind, you can use the Undo command to reverse the replace action; however, you must choose the Undo command before editing another record. You can also choose to replace all occurrences of the search text with a single click. You should use the Replace All option only when you are confident about making all the replacements without reviewing them first.

Step-by-Step 24.6



IC3
2-1.1.5
2-5.1.3

1. If necessary, open the **Updated Book Club 1** database from your solution files. Save the Updated Book Club 1 database as **Updated Book Club 2**, followed by your initials.
2. Open the **Book List** table. Position the insertion point at the beginning of the text in the first record in the *Publisher* column. Be careful not to select the contents in the cell.

QUICK TIP

The keyboard shortcut Ctrl+H opens the Replace tab in the Find and Replace dialog box.

3. In the Find group, click the **Replace** button to open the Replace tab in the Find and Replace dialog box. The *Find What* box displays the text from your last search. Type **Inc**. to replace the old search text. In the *Replace With* text box, type **Incorporated**.
4. Compare your screen to **Figure 24–10**, and make any necessary changes to match the following settings:
   a. The *Look In* box should show *Current field*.
   b. The *Match* box should show *Any Part of Field*.
   c. The *Search* box should show *All*.
   d. The *Search Fields As Formatted* option should be enabled.

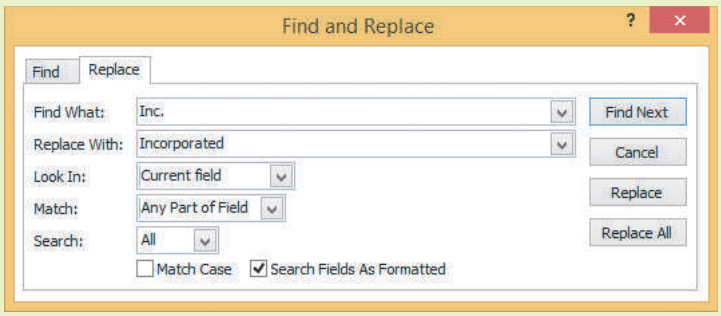


FIGURE 24–10
Replace tab in Find and Replace dialog box

5. When your settings match those shown in Figure 24–10, click **Find Next**. The first occurrence of the search text *Inc.*, which is in record #1, is highlighted.
6. In the dialog box, click **Replace**. The next occurrence of *Inc.* (record #3) is highlighted. If necessary, click and drag the dialog box title bar to reposition the dialog box on the screen so you can see the data in the table for record #1. In the record #1 entry, *Inc.* was replaced with *Incorporated*, and the other text in the publisher name was not changed.
7. On the Quick Access Toolbar, click the **Undo** button. Because you are editing a record, you must choose the Undo command before editing another record. The data in record #1 is restored and now shows *Inc.*.
8. Position the insertion point in any one of the records in the *Publisher* column. Be careful not to select the contents. In the Find and Replace dialog box, click the **Replace All** button. When prompted to continue, click **Yes**. Throughout the *Publisher* column, all occurrences of *Inc.* are replaced with *Incorporated*.
9. Close the dialog box. Scroll up and down to view all the entries in the column. Note that there are no more instances of *Inc.* as an abbreviation.
10. Save the changes, and close the table. Leave the database open for the next Step-by-Step.

Creating a Query

Although the Find command provides an easy way to find data, you only see the search results for one record at a time. You may need to locate multiple records, all containing the same values. If you have a large database, and several records contain the value you are searching for, this is another task that can be tedious.

Remember, you learned in Lesson 23 that a query is one of the types of database objects that appear in the Navigation Pane. A ***query*** enables you to locate multiple records matching specified criteria. The query provides a way for you to ask a question about the information stored in one or more database tables. Access searches for and retrieves data from the table or tables to answer your question.

VOCABULARY
query

To illustrate the benefits of using a query, consider the following example. Suppose you just read a book by Charles Dickens. You really enjoyed the book and you would like to read another book authored by him. You could locate the books by Charles Dickens one at a time in the Book Club database by using the Find command. But a query makes your search easier, and it also creates a list of the titles for you.

When you create a query, you must identify all the fields for which you want to retrieve and show information. For example, you might want to retrieve records and show only the title and the author name. The order in which you select the fields will be the order in which the information appears in the query results. The easiest way to create a query is to use the Query Wizard, which guides you through most of the process.

Step-by-Step 24.7

IC3
2-1.3.6
2-5.1.2

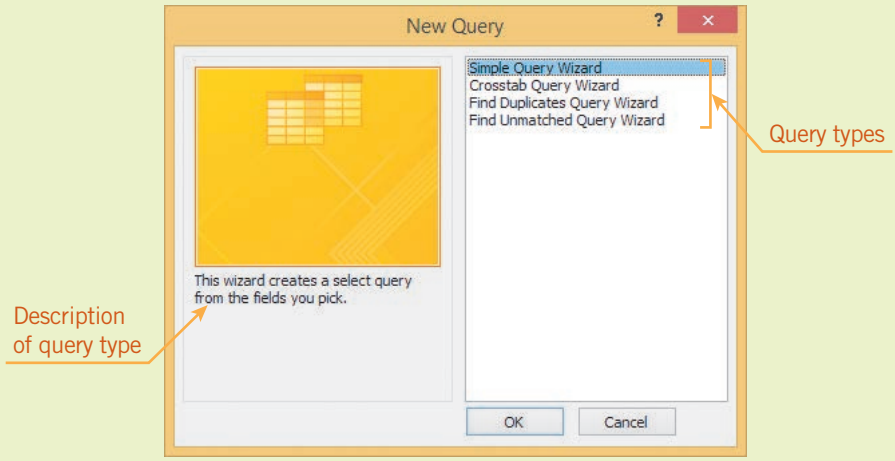
1. If necessary, open the **Updated Book Club 2** database from your solution files. Save the Updated Book Club 2 database as **Updated Book Club 3**, followed by your initials. Note there are currently no query objects for this database.
2. In the Navigation Pane, click **Book List : Table** to select the object. Click the **CREATE** tab. In the Queries group shown in **Figure 24–11**, click the **Query Wizard** button.



FIGURE 24–11
Queries group on the CREATE tab

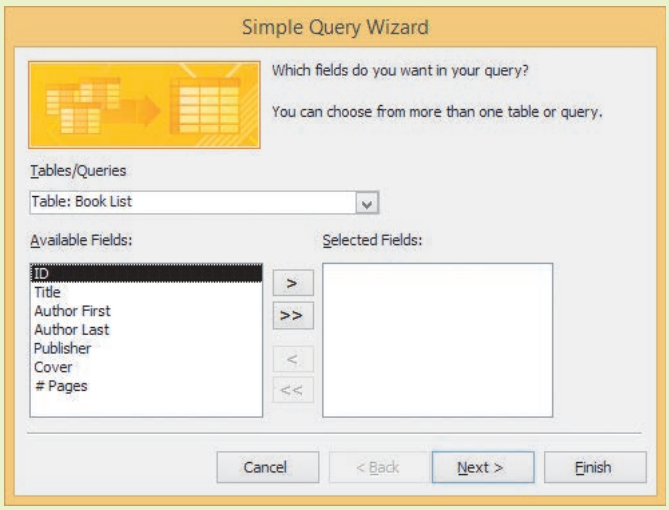
3. The New Query dialog box shown in **Figure 24–12** opens. In the right pane, the *Simple Query Wizard* option is already selected, and a description of the query is displayed under the image in the left pane. To become familiar with the different types of queries, click each of the options in the right pane, and read the description of each query in the left pane.

FIGURE 24–12
New Query dialog box with type options



4. In the right pane of the dialog box, click **Simple Query Wizard**, and then click **OK**. The Simple Query Wizard dialog box shown in **Figure 24–13** opens. Because you selected the *Book List : Table* in the Navigation Pane before you started the wizard, *Table: Book List* is already displayed under *Tables/Queries*.

FIGURE 24–13
Simple Query Wizard with field options



5. In the *Available Fields* pane, select **Author Last**, and then click the **Select Single Field** button [>]. In the *Available Fields* pane, select **Title**, and click the **Select Single Field** button. The *Author Last* and *Title* fields will be included in the query, in that sequence. Click **Next** to advance to the next step in the wizard.

6. The next step in the wizard, shown in **Figure 24–14**, prompts you to choose a name for the query. In the text box at the top of the dialog box, change the default name *Book List Query* to **Book List Query for Dickens**. If necessary, enable the option **Open the query to view information**.

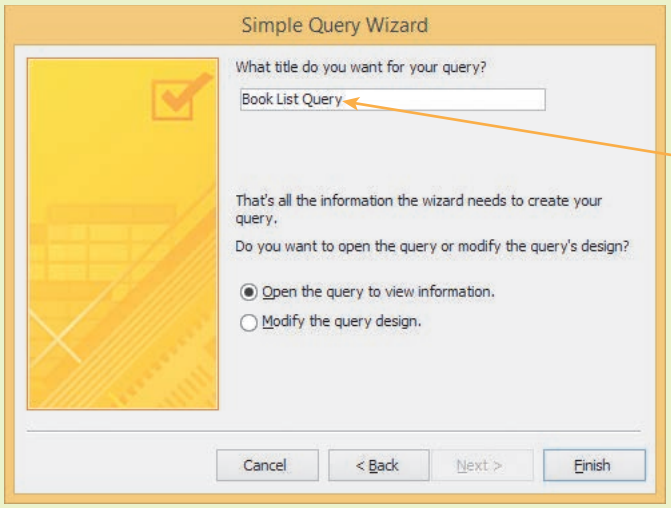


FIGURE 24–14
Simple Query Wizard prompt to assign a name for the query

7. Click **Finish**. The query object is opened in Datasheet view. All entries for the *Author Last* and *Title* fields are displayed. The *Book List Query for Dickens* object is displayed in the Navigation Pane under *Book List : Table* The Query icon next to the object name identifies the object type.

8. You want to show only entries for the author last name Dickens, so you still need to adjust the query. Click the **HOME** tab. In the Views group, click the **View** button arrow, and then select **Design View**. As shown in **Figure 24–15**, the two fields included in the Dickens query appear at the bottom of the object window.

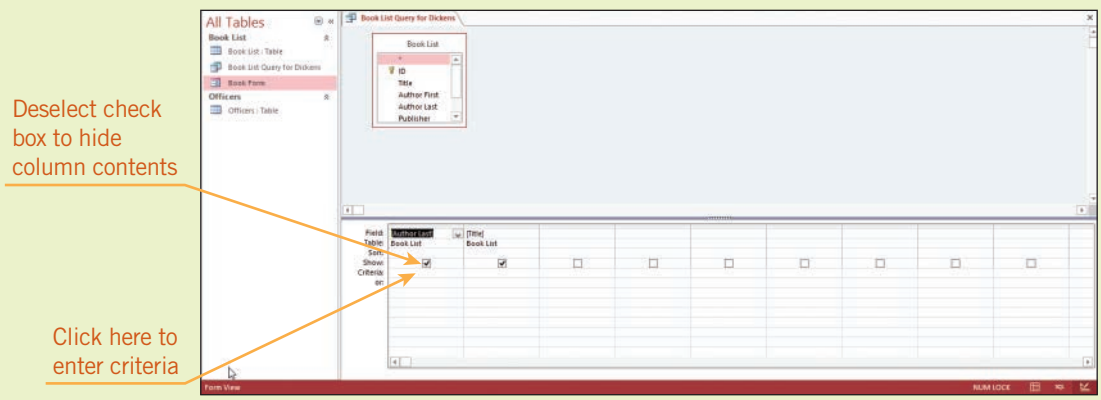


FIGURE 24–15
Book List Query for Dickens shown in Design view

9. In the first column next to *Criteria*, click the cell. Type **Dickens** and then press **Enter**. Quotations marks are automatically added to the criteria text which specifies that only records written by authors with the last name Dickens are included in the query.

10. In the *Author Last* column, click the **check box** to disable the option to show the field data. The data in this field will be used to retrieve records with Dickens as the author, but the data from this column will not show in the query results.
11. Save the changes to the query object. Then click the upper portion of the **View** button to switch back to Datasheet view. Now the query shows only the title for the four records containing Dickens in the Author Last field. Although data was retrieved from two fields, only the data from the Title field appears in the query. Close the query.
12. Leave the database open for the next Step-by-Step.

Creating a Report

VOCABULARY
report

You can print a database in Datasheet view, but when you do, all of the data contained in the database is printed. This can waste a lot of paper if the database is large or if you need only certain information from the database. A ***report*** is a database object that allows you to organize, summarize, and print all or a portion of the data in a database. You can create a report based on a table or a query.

Although you can prepare a report manually, the Report Wizard provides an easy and fast way to create a report. The wizard prompts you to specify the data you want to include in the report and how you want to format that data. One of the format options you apply in the report is page orientation. Remember, you learned in earlier lessons that the orientation determines how the report will be printed on the page. Landscape orientation formats the report with the long edge of the page at the top; portrait orientation formats the report with the short edge of the page at the top.

In Design view, you can format headers and footers using page numbers, titles, and dates and time. You can also add graphics to the header or footer, such as a logo.

Step-by-Step 24.8

IC3
2-1.1.9
2-1.3.6
2-1.4.1
2-1.4.2
2-5.1.1

1. If necessary, open the **Updated Book Club 3** database from your solution files. Save the Updated Book Club 3 database as **Updated Book Club 4**, followed by your initials. Note there are currently no report objects for this database.
2. In the Navigation Pane, click **Book List : Table** to select the object. Click the **CREATE** tab. In the Reports group shown in **Figure 24–16**, click the **Report Wizard** button. The Report Wizard dialog box shown in **Figure 24–17** opens. In the text box under *Tables/Queries*, the table reference *Table: Book List* is displayed because you identified the table before starting the wizard.

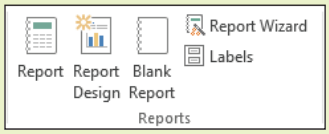


FIGURE 24–16
Reports group on the CREATE tab

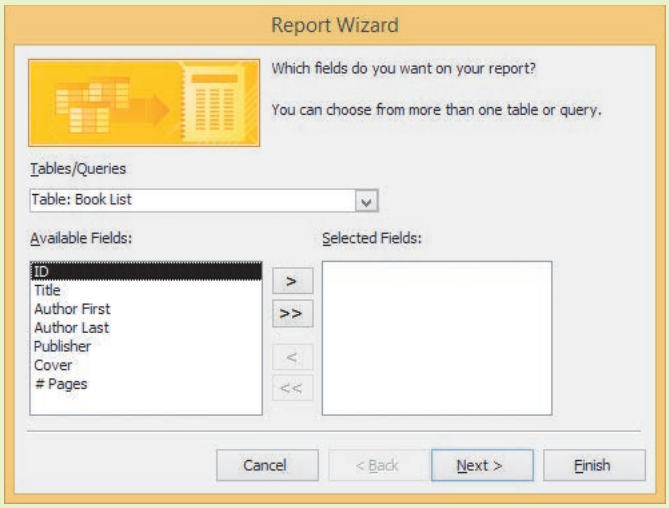


FIGURE 24–17
Report Wizard dialog box with field options

3. Choose the field names from the *Available Fields* pane, and arrange them in the order in which they are to appear in the report:
   a. Click **Author First**, then click the **Select Single Field** button to move the field name to the *Selected Fields* pane.
   b. *Author Last* is already selected. Click the **Select Single Field** button.
   c. Click **Title**, and then click the **Select Single Field** button.
   d. *Publisher* is already selected. Click the **Select Single Field** button.
4. Four fields to be included on the report are displayed in the *Selected Fields* pane. Click **Next** to advance to the next step in the wizard. The options for grouping the fields are not necessary for this report. Click **Next** to move on to the next step.
5. Options for the sort order of the records are displayed, as shown in **Figure 24–18**. In the first box, click the **list arrow**, and then click **Author Last**.

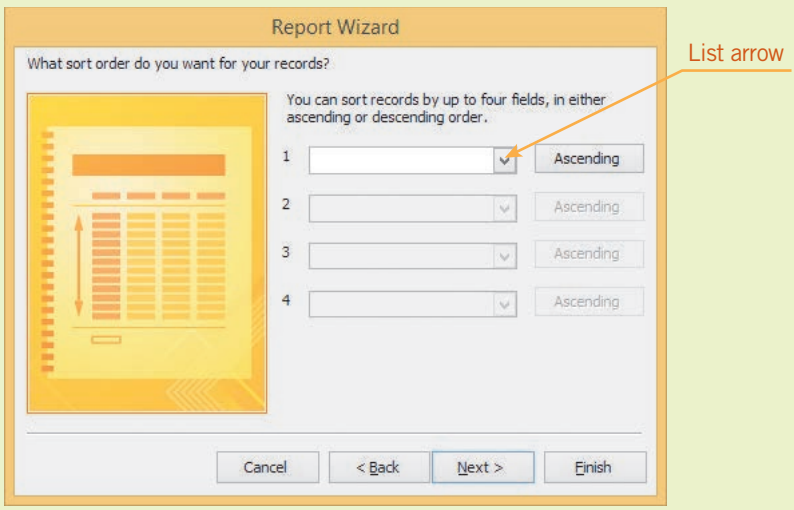
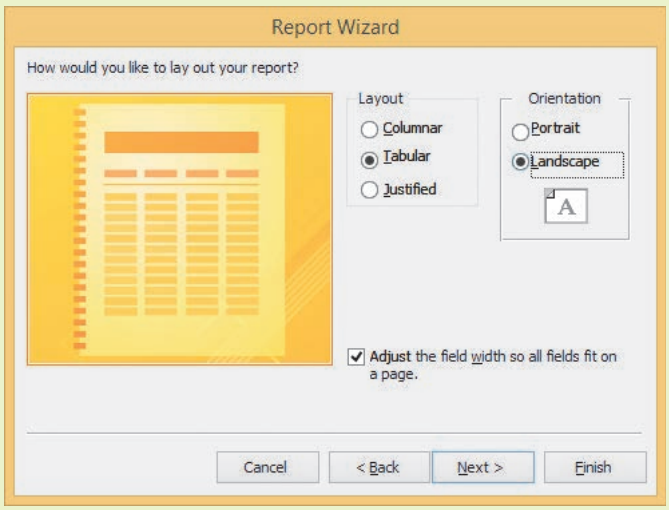


FIGURE 24–18
Report Wizard dialog box with sort options

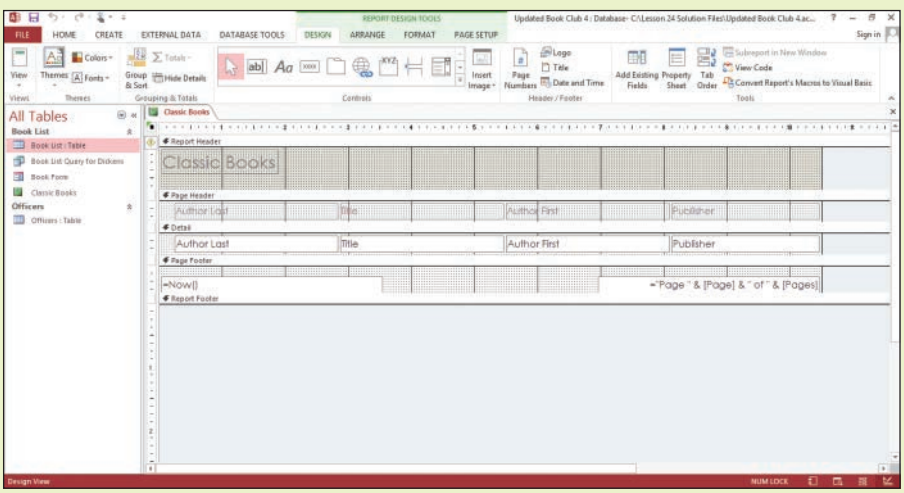
6. Next to the first box, click **Ascending**. The option toggles to *Descending*. Click **Descending** to toggle back to the default *Ascending* setting.
7. Click the **list arrow** in the second box, and then click **Title**. If there are two or more books by the same author, the titles will be ordered first by the author last name, then by the book title, in ascending order. Click **Next** to move to the next step in the wizard.
8. Options for layout and orientation appear. If it is not already enabled, click the **Tabular layout** option. Then click the **Landscape** orientation option to enable it. If necessary, enable the **Adjust the field width so all fields fit on a page** option. When your settings match those shown in **Figure 24–19**, click **Next** to move on to the last step.

FIGURE 24–19
Report Wizard dialog box with layout options



9. The new dialog box prompts you to enter a title for the report. The current title is *Book List*, because that is the name of the table. Change the title to **Classic Books**. Enable the option to **Modify the report's design** and then click **Finish**. The report opens in Design view as shown in **Figure 24–20**, and the REPORT DESIGN TOOLS DESIGN tab appears.

FIGURE 24–20
Classic Books report in Design view



10. In the Header/Footer group, click the **Logo** button. Navigate to the drive and folder where your Data Files folder is stored. Select the file **Dixon Logo.jpg** and then click **OK**. The graphic is inserted in the Report Header pane, as shown in **Figure 24–21**. The eight sizing handles indicate that the object is selected.

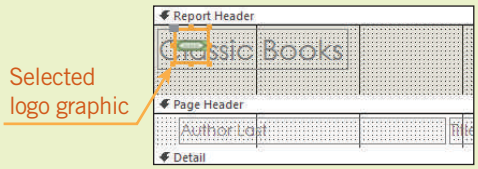


FIGURE 24–21
Logo graphic inserted in Report Header pane

11. Point to the border of the *Dixon Logo* object. When the pointer changes to a four-pointed arrow, click and drag the **Dixon Logo** object to align the left border of the object with the 4" mark on the ruler as shown in **Figure 24–22**.

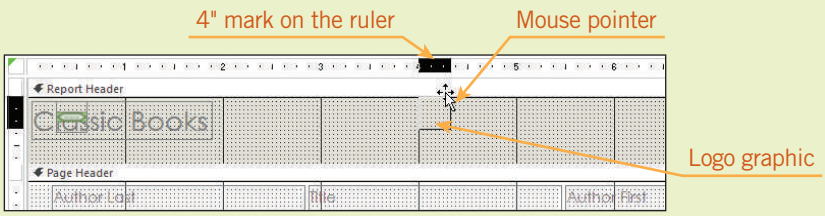


FIGURE 24–22
Repositioning the logo graphic

12. Then drag the lower-right corner of the object to the right to align with the 6" mark on the ruler, and then down to the bottom edge of the Report Header pane as shown in **Figure 24–23**. After resizing the object, it should look like the object shown in **Figure 24–24**.

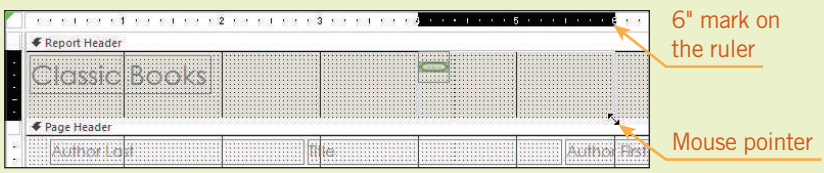


FIGURE 24–23
Resizing the logo graphic



FIGURE 24–24
Logo graphic repositioned and resized

13. Click the **View** button to toggle back to Report view. The report title *Classic Books* and the logo appear in the header. The *Classic Books* report object displays in the Navigation Pane. The Report icon next to the object name identifies the object type.

14. Save the changes and then close the Report. Leave the database open for the next Step-by-Step.

Printing a Report

You already used the Print Preview feature to view how a document will print. Print options in Backstage view are not the same as for Word, Excel, and PowerPoint. However, there are still several options you can choose in the Print dialog box. For example, if the report has multiple pages, you can choose which pages to print. You can also choose the number of copies to print. And, you can change the margin settings before you send the data to the printer.

Step-by-Step 24.9

IC3
2-1.1.4
2-1.3.6

1. If necessary, open the **Updated Book Club 4** database from your solution files.
2. Double-click the **Classic Books** report to open the report.
3. Click the **FILE** tab. In the left pane, click **Print**. Three print options display in the right pane. The *Quick Print* option sends the report to the printer using default settings and printing the entire report.
4. In the right pane click **Print Preview**. A preview of the report opens in Print Preview, and the Ribbon adapts to show the PRINT PREVIEW tab.
5. In the Zoom group, shown in **Figure 24–25**, click the **Zoom** button arrow and then click **50%**. The preview of the report is reduced so you can see how the entire printed page will look.

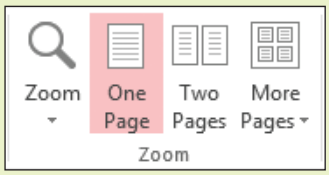


FIGURE 24–25
Zoom group on the PRINT PREVIEW tab

6. On the far right side of the PRINT PREVIEW tab in the Close Preview group, click the **Close Print Preview** button.
7. Click the **FILE** tab and then click **Print**. In the right pane, click **Print**. The Print dialog box, similar to the one shown in **Figure 24–26**, opens. Your dialog box will most likely differ. Here you can change settings such as the print range and the number of copies and select options such as Collate.

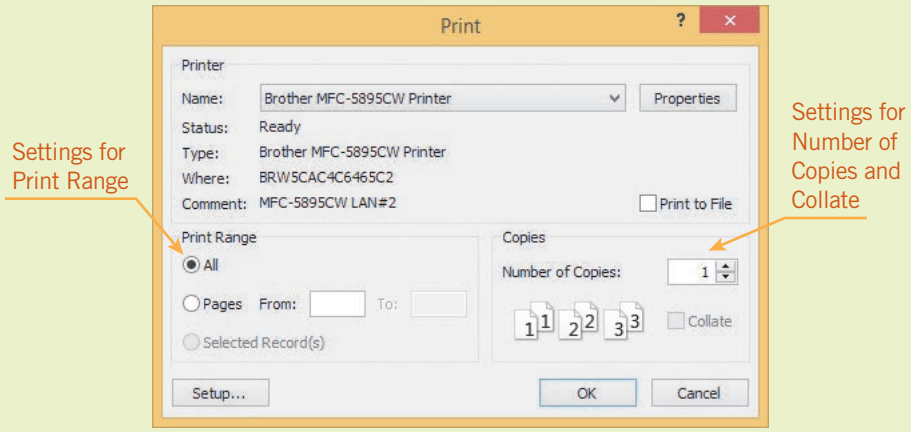


FIGURE 24–26
Print dialog box

8. At the bottom of the dialog box, click the **Setup** button to open the Page Setup dialog box shown in **Figure 24–27**. Here you can choose more settings for margins and columns. Close the Page Setup dialog box without making any changes. Then close the Print dialog box without printing the report.

ABOVE AND BEYOND

To change the appearance of the report, switch to Design view and then apply a different theme and/or colors and fonts.

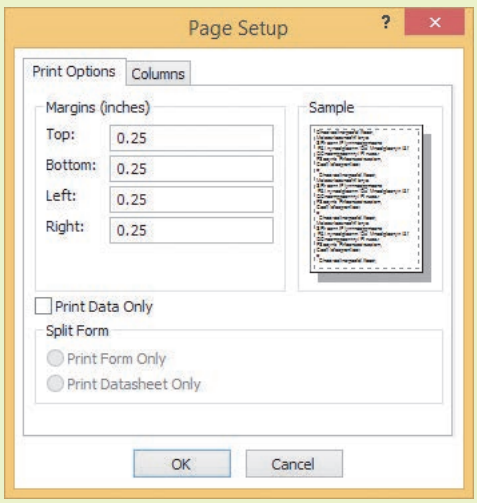


FIGURE 24–27
Page Setup dialog box

9. Close the report and the database, leaving Access open for the next Step-by-Step.

Creating Mailing Labels

Because databases often contain data regarding names and addresses, it is common to create mailing labels based on the database information. For example, you can quickly create labels for the vendors or suppliers in the GO Construction database. Access provides a wizard to use a report format to create the labels. When you use the Label Wizard, you can customize the layout of the fields that controls how the data appears on the label.

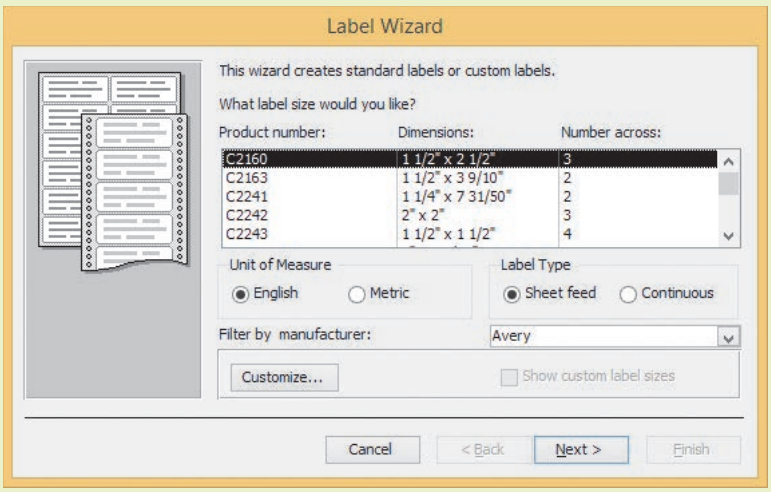
The Label Wizard includes a step to sort the database records. For bulk mail rates, the mail must be sorted by postal code, so sorting the labels before printing saves a lot of time.

Step-by-Step 24.10

2-1.1.4
2-1.1.9
2-1.2.2
2-1.3.6

1. Open the **Updated GO Construction 3** database from your solution files. Save the Updated GO Construction 3 database as **Updated GO Construction 4**, followed by your initials.
2. In the Navigation Pane, select **Vendors : Table**. (The wizard will not prompt you to choose a table, so you must make sure the correct table is selected.) Click the **CREATE** tab. In the Reports group, click the **Labels** button. The Label Wizard dialog box shown in **Figure 24–28** opens.

FIGURE 24–28
Label Wizard dialog box with label type options



3. If necessary, under *Product number*, scroll to the top of the list and click **C2160** to specify the label size. (Product numbers appear on the label packaging.) If necessary, under *Label Type*, enable the **Sheet feed** option. Also, if necessary, in the *Filter by manufacturer* list box select **Avery**. When your settings match those shown in Figure 24–28, click **Next** to advance to the next step in the wizard.
4. The next step in the wizard, shown in **Figure 24–29**, describes the font formats on the mailing label. If necessary, change the font name to **Arial**, the font weight to **Light**, and the font size to **10**. The preview in the dialog box reflects the font changes as you apply them. When your settings match those shown in Figure 24–29, click **Next** to move to the next step in the wizard.

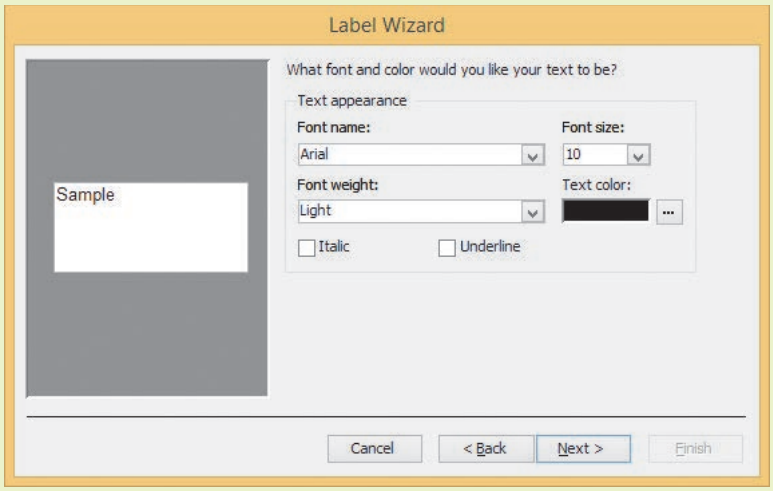


FIGURE 24–29
Label Wizard dialog box with font options

5. In this step you choose the fields and arrange them on a prototype label. Select and arrange the fields as follows:
   a. In the *Available Fields* pane, click **Vendor**. Click the **Select Single Field** button. The field is moved to the *Prototype label* list, and brackets are inserted before and after the field name.
   b. Press **Enter**. With the insertion point still positioned in the *Prototype label* box, type **ATTN**, and then press the **spacebar**.
   c. In the *Available fields* pane, the field name *Contact* is already selected. Click the **Select Single Field** button. The *Contact* field is inserted at the location of the insertion point. Press **Enter**.
   d. In the *Available fields* pane, the field name *Address* is already selected. Click the **Select Single Field** button, and press **Enter**.
   e. In the *Available fields* pane, the field name *City* is already selected. Click the **Select Single Field** button. Press the **spacebar**, and then click the **Select Single Field** button to insert the *State* field. Press the **spacebar**, and then click the **Select Single Field** button to insert the *Postal Code* field. The *City, State*, and *Postal Code* fields are all moved to the *Prototype label* list and will appear on the same line of text.

QUICK TIP

Instead of clicking the Select Single Field button, you can double-click a field name to move it to the Prototype label.

6. When your prototype label looks like the one shown in **Figure 24–30**, click **Next**.

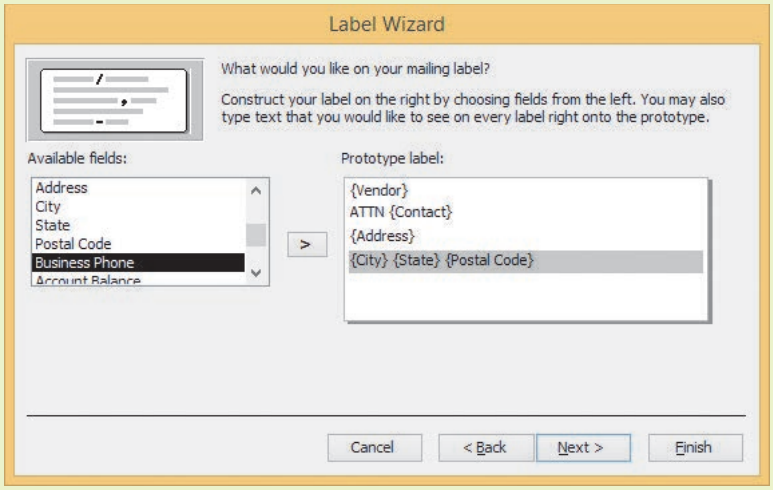


FIGURE 24–30
Label Wizard dialog box with Prototype label layout

7. The next step in the wizard is to sort the labels. In the *Available fields* pane, click **Postal Code**, and then click the **Select Single Field** button. The field name is moved to the *Sort by* list. Click **Next**.
8. The last step in the wizard is to name the report. The proposed name *Labels Vendors* is good, so no changes are necessary. If necessary, enable the **See the labels as they will look printed** option. Click **Finish**. The report opens in Print Preview. If you were printing the labels, you would put the label sheets in your printer and then click the Print button on the PRINT PREVIEW tab.
9. On the right side of the PRINT PREVIEW tab, click the **Close Print Preview** button. The report is displayed in Design view.
10. Click the **View** button arrow, and then click **Report View**. The labels appear in a single column.
11. Click the **View** button arrow again, and then click **Layout View**. The labels still appear in a single column. In this view you can change the font style, font colors, etc.
12. Click the **View** button arrow again, and then click **Design View**. As you can see, the information appears as it will print only when you display the report in Print Preview.
13. Close the report. The *Labels Vendors* object appears in the Navigation Pane, and the report icon indicates that the object is a report.
14. Leave the database open for the next Step-by-Step.

Sharing Database Files

In this lesson and in Lesson 23, you have been working with traditional desktop databases. Unlike other Office 2013 applications, the traditional desktop databases created in Access 2013 do not include features for sharing desktop databases. To share an Access database using SkyDrive or the Cloud, you must use an Access app to create the database so that you can publish it online.

Templates for the Access app are accessible in the Access startup screen. The templates with a globe icon will create Access apps; the templates with the word *desktop* in the title will create traditional desktop databases. If you want to design an app on your own, you can click the Custom web app template. To create an Access app, you will need Access 2013 and SharePoint Server 2013 or an Office 365 site, which is beyond the scope of this lesson.

Even though you cannot track changes or add comments to table cells in a traditional desktop database, you can create a Comment table in a database. Users can then add comments in the table and review comments from other users.

You can share database files via e-mail by attaching a database file to an e-mail message. To prevent unauthorized access to a database file, you can encrypt the file by setting a password. To encrypt (and decrypt) a database file, you must open the file in Exclusive mode using the Open dialog box.

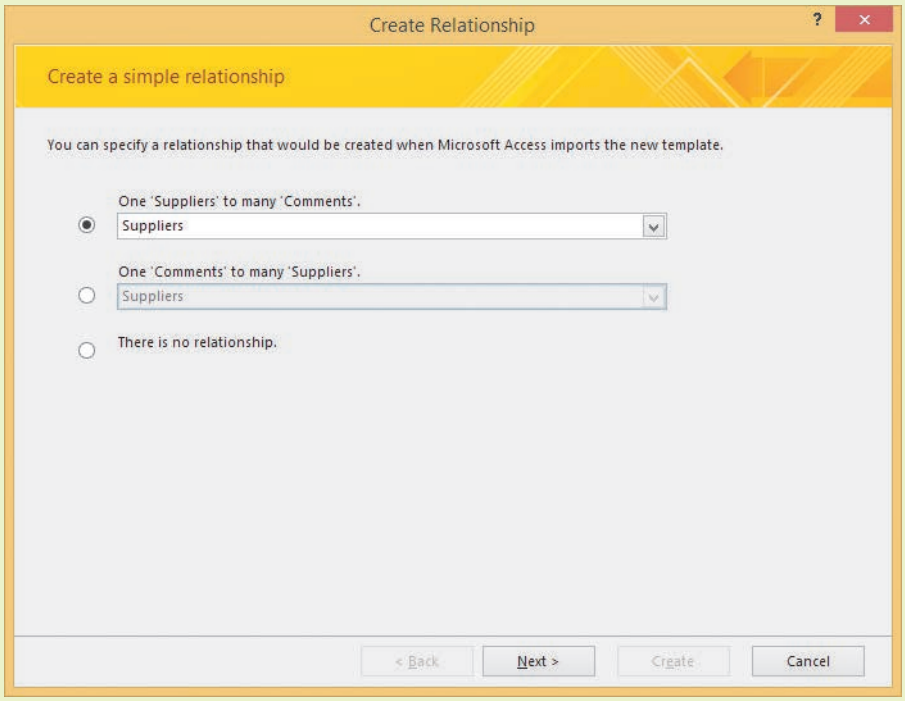
Step-by-Step 24.11

IC3
2-1.3.2
2-6.1.1
2-6.1.2
2-6.1.3
2-6.2.1
2-6.2.2
2-6.2.3

1. If necessary, open the **Updated GO Construction 4** database from your solution files. Save the Updated GO Construction 4 database as **Updated GO Construction 5**, followed by your initials. If necessary, close any open database objects.
2. Click the **CREATE** tab. In the Templates group on the far left side of the Ribbon, click the **Application Parts** button  . A gallery of templates displays.

3. Under *Quick Start*, click **Comments**. The Create Relationship dialog box shown in **Figure 24–31** opens. Enable the option **There is no relationship** and then click **Create**. *Comments : Table* table displays in the Navigation Pane.

FIGURE 24–31
Create Relationship dialog box



4. In the Navigation Pane, double-click **Comments : Table**. The table opens with three fields: *ID, Comment Date*, and *Comment*.
5. Click the first cell under the *Comment Date* heading and type the current date. Do not be concerned about the date format; the default short date format (mm/dd/yyyy) will be formatted after you enter the data.
6. Press **Tab** and type the following sentences:

   I have reviewed all of the data. Everything looks great!
7. Press **Tab**. Save the changes and close the table. Click the **FILE** tab and then click **Close** to close the database without closing the Access application window.
8. Click **Open Other Files** at the bottom of the left pane. In the middle pane, click **Computer**. In the right pane, click the **Browse** button.
9. Navigate to the drive and folder where your solution files are stored and select the **Updated GO Construction 5** database.

QUICK TIP

You can also add comments to a table by adding a Long Text field to the table. Users can then review and add comments in that field.

10. At the bottom of the dialog box, click the **Open** box down arrow to display the menu shown in **Figure 24–32**. Click **Open Exclusive**.

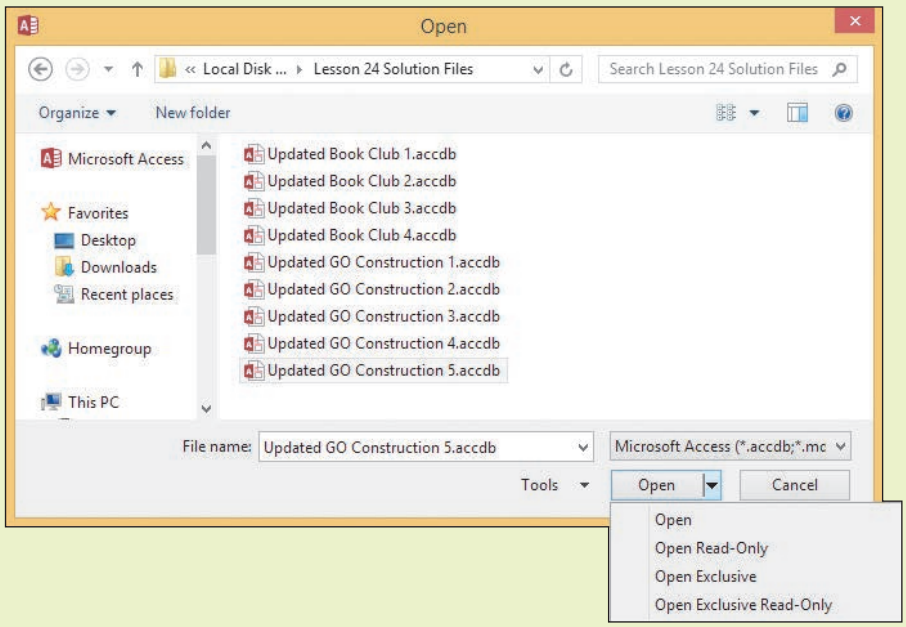


FIGURE 24–32
Open options

11. Click the **FILE** tab, and if necessary, click **Info**. In the right pane, click the **Encrypt with Password** button. The Set Database Password dialog box opens.
12. In the *Password* box, type **sk4D4v4!** and then press **Tab**. Type the password again in the *Verify* box. Then click **OK**. When prompted that row level locking will be ignored, click **OK**. The file is encrypted. Users must have the password to open the file.
13. Click the **FILE** tab and then click **Close**. Click the **FILE** tab, click **Open** and in the right pane under *Recent*, click **Updated GO Construction 5**. When prompted to enter the password, type **sk4D4v4!** and then click **OK**. You now have access to the database. Close the database.
14. Reopen the database in Exclusive mode. Click the **FILE** tab and then click **Open**. Click **Computer** and then click the **Browse** button. Navigate to the file and folder where your solution files are saved and select the **Updated GO Construction 5** database. Click the **Open** box arrow and then click **Open Exclusive**. When prompted to enter the password, type **sk4D4v4!** and then click **OK**.
15. Click the **FILE** tab, and if necessary, click **Info**. In the right pane, click the **Decrypt Database** button. Type the password **sk4D4v4!** and press **Enter**. The encryption is removed and you no longer need a password to access the file. Close the database file.

QUICK TIP

Passwords should be at least 8 characters in length and include both uppercase and lowercase letters, numbers, and symbols.

WARNING

If you lose the password for an encrypted database, you will be unable to use the database. You can only decrypt the file and remove the password if you know the password.

TECHNOLOGY CAREERS

Data Entry Keyers

The amount of information that businesses maintain continues to grow, and this information needs to be entered into a database. If you are a fast and accurate keyboarder, have a good eye for detail, and enjoy working at the computer all day, a data entry job might be the right career choice for you. In addition to entering data, data entry keyers verify the accuracy of the data they enter. They proofread entries, perform accuracy tests, correct errors, and compile and sort data. Accuracy is emphasized; inaccurate data means inaccurate records, and errors can cost the business a lot of money.

Data entry keyers are employed in every sector of the economy. Primary employers include data processing firms; accounting, auditing, and bookkeeping firms; banks and credit unions; and state and local governments. Typical job titles include billing clerk, accounting clerk, production clerk, data entry operator, and key data operator. Many data entry keyers work regular workdays, but they can work from remote locations with flexible hours as well. A data entry job can help you get your foot in the door with an employer, and then you can work your way up to a better paying job with more responsibilities.



SUMMARY

In this lesson, you learned:

- You can create a form object using the Form button or the Form Wizard. The Form Wizard helps you create a customized layout for entering data.
- Entering and editing data in a form is similar to entering data in a table in Datasheet view. You use the same navigation buttons to move from one record to another.
- You can sort records in Datasheet view in either ascending or descending order.
- The Find command can save you time looking for records and specific values in a table. The Replace command can save you time finding and replacing specific text. You can choose to replace text in individual occurrences or all at once.
- You can create a query to find field data for records that match specified criteria.
- A report allows you to organize, summarize, and print all or a portion of the data in a database. You can insert, reposition, and resize logo graphics in the header and footer panes.
- After creating a report using the Report Wizard, you can review the report in Print Preview before sending it to the printer.
- When you want to create mailing labels, you create a report object using the Label Wizard.
- To add comments to a database, you can create a Comments table.
- To prevent unauthorized access to a database file, you can encrypt the file.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. When you work with a form, you have four options for viewing the object.

T F 2. When you use the Label Wizard to create mailing labels, you control the layout of the fields as they will appear on the label.

T F 3. After adding a new record in Form view, the table is automatically updated and shows the new record.

T F 4. Ascending order sorts alphabetically from *Z* to *A* and numerically from the lowest to the highest number.

T F 5. Once you sort table data, you cannot undo the action, nor can you restore the table to its original arrangement.

T F 6. When you use the Replace command, you can replace all occurrences at once.

T F 7. When you create a query, the order in which you select the fields will be the order in which the information appears in the query results.

T F 8. When you create a report, you can choose the order in which the information appears.

T F 9. Landscape orientation formats the report with the long edge of the page at the top.

T F 10. You can create a report based on a table or a query.

MULTIPLE CHOICE

Select the best response for each of the following statements.

1. _____ view enables you to make changes to the form's design.
   A. Layout C. Design
   B. Form D. A or B
2. A _____ can make the process of entering data more efficient and more accurate.
   A. query C. wizard
   B. form D. report
3. When searching for a record, you can search for data contained in _____.
   A. a specific field C. all the tables in the database
   B. the entire table D. A and B
4. When you create mailing labels, you create a new _____.
   A. query C. table
   B. report D. form
5. A _____ enables you to locate all records that match certain criteria.
   A. report C. form
   B. sort D. query

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. To create a database that you can publish online (SkyDrive or the Cloud), you must create the database using a(n) _____.
2. To enter data in a form, the form must be opened in _____ view.
3. In _____ view, you can change the properties and add new fields to a form.
4. To prevent unauthorized access to a database file, you can _____ the file.
5. To locate search text and replace it with new text, use the _____ command.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What are the advantages of using the Form button to create a form?

2. What are the advantages of using the Form Wizard, instead of the Form button, to create a form?

3. Explain when you would use the Replace All option in the Find and Replace dialog box.

4. Why would you create a query when you can use the Find command to locate data?

5. What are the advantages of creating a report before printing data?

PROJECTS

PROJECT 24–1

In this project and the next three projects, you will work with a database containing information about the Riverside Cleanup Crew, a volunteer program that coordinates annual events to clean up and remove trash from the local rivers, creeks, and streams.

1. Open the database **Riverside** from the drive and folder where your Data Files folder is stored. Save the Riverside database as **Updated Riverside 1**, followed by your initials.
2. Use the Form Wizard to create a form based on the *Volunteers* table:
   a. Include all the fields, in the same sequence, except *# Hours*.
   b. Apply the Columnar layout.
   c. Name the form **Volunteer Form**. Preview the form in Print Preview.
3. Switch to Layout view, and apply the *Slice* theme. Save the changes to the form design.
4. Switch to Form view, and use the new form to add the following two new records to the Volunteers table:

First Name:	**Justin**
Last Name:	**Kennedy**
Address:	**4513 Cove Trail**
City:	**Anderson**
State:	**SC**
Postal Code:	**29621-2134**
Phone:	**864-555-4911**
Birth Date:	**6/11/1999**
River:	**Savannah**
Join Date:	**5/1/2015**

First Name:	**Jessica**
Last Name:	**Jones**
Address:	**506 Heritage Drive**
City:	**Anderson**
State:	**SC**
Postal Code:	**29621-1666**
Phone:	**864-555-1985**
Birth Date:	**4/18/1989**
River:	**Savannah**
Join Date:	**5/1/2015**

IC3
2-1.1.4
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2-1.3.2
2-1.3.5
2-5.1.3

5. Navigate to record #10. Edit the phone number to **864-555-5015**.
6. Gary Phillips has moved. Find his record (search for the last name), and change the street address to **2116 Woodside Avenue, Anderson, SC 29625-2810**. His new phone number is **864-555-9655**.
7. Several of the area codes in the Phone field are incorrect. The numbers have been transposed. Search the Phone field for all occurrences of 846, and replace all occurrences with **864**.
8. Sort the table data in ascending order based on the Last Name field.
9. Save the changes to the table, and then close the table. If necessary, close the form. Leave the database open for the next Project.

PROJECT 24–2

2-1.1.4
2-1.3.2
2-1.3.6
2-1.4.1
2-1.4.2
2-5.1.1
2-5.1.2

1. If necessary, open the database **Updated Riverside 1** from your solution files. Save the Updated Riverside 1 database as **Updated Riverside 2**, followed by your initials.
2. You would like to contact the volunteers who clean up the Saluda River. Use the Query Wizard to create a simple query based on the Volunteers table:
   a. Include the Last Name, First Name, Phone, and River fields, in that order.
   b. Save the query as **Saluda Volunteers Query**.
3. The criteria for the query is for those who clean the Saluda River. Specify the criteria **Saluda** in the River field. The River field does not need to show in the query.
4. Preview the query in Datasheet view. Save and close the query, and, if necessary, close the Volunteers table.
5. You would like to print a list of the names and phone numbers of all sponsors. Use the Report Wizard to create the report based on the Sponsors table:
   a. Include the Name and Phone fields, in that order.
   b. Do not group the report.
   c. Sort the report by Name in ascending order.
   d. Choose the Columnar layout and Portrait orientation.
   e. Name the report **Sponsors Phone List**, and preview the report. Adjust the zoom settings if necessary so you can preview a full page of the report.
6. Close Print Preview, and then save and close the report.
7. For an upcoming recognition event, you want to prepare a list of all the volunteers and the number of hours they have devoted to the organization. Use the Report Wizard to create the report based on the Volunteers table:
   a. Include the # Hours, First Name, and Last Name fields from the Volunteers table, in that order.
   b. Do not add any grouping levels.
   c. Sort the report by the # Hours field, in descending order.
   d. Choose the Columnar layout and Portrait orientation.
   e. Name the report **Volunteer Hours**.
   f. Modify the report. In the Report Header pane, insert the **RCC Logo.jpg** graphic from the drive and folder where your Data files are stored. Reposition as desired and resize as necessary.
8. Preview the report in Print Preview. Adjust the zoom settings so you can preview a full page.
9. Save and close the report. Leave the database open for the next Project.

PROJECT 24–3

2-1.1.4
2-1.1.9
2-1.2.2
2-1.3.2
2-1.3.6
2-5.1.1

1. If necessary, open the database **Updated Riverside 2** from your solution files. Save the Updated Riverside 2 database as **Updated Riverside 3**, followed by your initials.
2. To mail the quarterly newsletter to the volunteers, create mailing labels based on the Volunteers table. Start the Label Wizard, and use the following label and font settings:

Product number:	**J8160**
Unit of Measure:	**English**
Label Type:	**Sheet feed**
Manufacturer:	**Avery**

3. Set the text settings as follows:

Font name:	**Cambria**
Font size:	**11**
Font weight:	**Light**
Text color:	**Black**

4. In the prototype label:
   a. Enter the First Name and Last Name fields on the first line, separated by a space.
   b. Insert the Address field on the second line.
   c. Insert the City, State, and Postal Code fields on the third line. Enter a blank space after the City and State fields, and do not use any punctuation between the city and state fields.
5. Sort the labels by the Postal Code field.
6. Name the report **Volunteers Mailing Labels**, and preview the report in Print Preview. Adjust the zoom settings so you can preview a full page.
7. Close the report, and leave the database open for the next Project.

PROJECT 24–4

2-1.3.1
2-1.3.2
2-6.1.1
2-6.1.2

1. If necessary, open the database **Updated Riverside 3** from your solution files. Save the Updated Riverside 3 database as **Updated Riverside 4**, followed by your initials.
2. Close the database and then reopen the database in Exclusive mode.
3. Add a Comments table to the database using the setting for no relationships.
4. In the Comments table, add the following comments using the current date.

   Verify that the postal code for Jessica Jones is correct.

   Confirm that Juanita Moorhead is still an active member.
5. Save the changes and then encrypt the file using the **CK#3991*** password.
6. Close the database.

TEAMWORK PROJECT

2-1.1.9
2-1.3.2
2-5.1.3

Create a roster for your computer class or workgroup to record the names, addresses, phone numbers, e-mail addresses, and other information about your classmates or coworkers. Follow these steps:

1. With a teammate, determine what information you want to gather and organize. Divide the names of your classmates or coworkers so each of you will gather information for half the group.
2. After you have gathered the information, create a new database and a table with the fields you identified in Step 1. Save the document as **TP 24–1**, followed by your initials.
3. Then create a form to make data entry easier. Select the options you think will present the information you have collected in the best way, and give your form a relevant title.
4. Enter the information into the form.
5. Sort the data in ascending order by last name.
6. Save the changes to the database.

CRITICAL THINKING

CRITICAL THINKING 24–1

2-5.1.2

In Projects 24–1, 24–2, and 24–3, you worked with a database for a community volunteer program. The program manager wants to recognize the youth volunteers. How can the Volunteers table data be arranged so the program manager can easily identify those volunteers who are under 18 years old?

1. Create a new Word document, and save the document as **CT 24–1**, followed by your initials.
2. Write two or three sentences explaining how you would manipulate the table data to help the manager.
3. Save the changes to the document.

CRITICAL THINKING 24–2

As you know, databases are not just for storing data. Databases are also used as tools for analyzing and organizing data. To ensure that the database meets your needs, a lot of thought must go into the planning before the database is created.

1. Create a new Word document, and save the document as **CT 24–2**, followed by your initials.
2. Create a list of steps you would follow in planning the fields to include in a database.
3. Save the changes to the document.

ONLINE DISCOVERY

When mailing a letter to another country, how can you be sure you have addressed the envelope or package correctly? Go to www.usps.com, and then search for information regarding addressing international mail. Also search other online resources to gather information about the destination country's postal services.

1. Create a new Word document, and save the document as **OD 24–1**, followed by your initials.
2. Using the information you find online, edit the following information to show the address data in the correct format required for delivery of a letter in the destination country. Cite the URLs for the Web pages where you find the supporting information.

   First and Last Name
   36 Silvergrove Court N.W.
   Calgary, Alberta
   Canada
   T3B5A3

   First and Last Name
   P.O. Box 30009
   Wonderboompoort
   0033 South Africa

   First and Last Name
   38 Upland Drive
   Brookmans Park
   Hatfield, Hertfordshire
   AL9 6PT
   England

   First and Last Name
   Blk 35 Mandalay Road
   # 15 Mandalay Towers
   Singapore 308215
3. Save the changes to the document.



2-1.1.8

JOB SKILLS

Use the Internet to research job prospects for data entry keyers. Explore the education and skills required, the job outlook, the average salary, and related occupations.

1. Create a new Word document, and save the document as **JS 24–1**, followed by your initials.
2. Write a brief summary of the information you gathered.
3. Save the changes, and close the Word document.



2-1.3.5

EXPLORE AND SOLVE

Explore how to add page numbers and the current date in a header or footer in a database report.

Or, create your own form or report without using a wizard.

1. Open the **Updated Riverside 3** database from your Solutions folder. Save the Updated Riverside 3 database as **ES 24–1**, followed by your initials.
2. Open the report and add page numbers and the current date in a header or footer.
3. Save the changes, and close the database.



2-1.2.1
2-1.3.2
2-5.1.1



Estimated Time:
2.5 hours

Key Applications

IC3 Pretest

UNIT REVIEW

DATA FILES

To complete this lesson, you will need these data files:

Bird.jpg
Elephant.jpg
Giraffe.jpg
Mountain.jpg
Rail Trail.pptx
Safari.docx
Scenic Trail.docx
Species.accdb
Survey.xlsx
The Climb.pptx
Travel Data.xlsx
Travel Notes.docx
Volunteers.accdb

REVIEW QUESTIONS

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. When text is too wide to fit in a cell, by default Excel automatically wraps the text in the cell.

T F 2. By default, Excel automatically wraps text in a cell.

T F 3. The Undo command is not always available in Access.

T F 4. Statistical functions perform calculations that you could perform using a scientific calculator.

T F 5. Format Painter will copy and apply both font and paragraph formats.

T F 6. When you apply a style, you apply multiple formats in one simple step.

T F 7. Portrait orientation is the default setting for Word, Excel, and Access.

T F 8. In PowerPoint, you can edit slide contents in Slide Sorter view.

T F 9. In Excel, the SUM function counts the number of cells with values in the specified range.

T F 10. In PowerPoint, text boxes enable you to position text anywhere on a slide, even outside a placeholder.

T F 11. You can automatically adjust column widths to fit the content in Word tables, Excel worksheets, and Access datasheets.

T F 12. You can change the order of PowerPoint slides on the Outline tab by dragging and dropping the slide thumbnails.

T F 13. When you can create a database form with a single click using the Form button, you decide which fields to include on the form.

T F 14. Pasting the content of the Clipboard deletes the contents from the Clipboard.

T F 15. Encrypting a file is the most secure option for preventing unauthorized access to a document.

MULTIPLE CHOICE

Select the best response for each of the following statements.

1. _____ are settings that determine how a slide is introduced as you move from one PowerPoint slide to another in Slide Show view.
   A. Triggers
   B. Slide transitions
   C. Entrance effects
   D. Motion paths
2. The _____ serves as the primary interface between the user and the application.
   A. application window
   B. taskbar
   C. document window
   D. status bar
3. A(n) _____ is a number or cell reference in an Excel formula.
   A. function
   B. operator
   C. operand
   D. none of the above
4. When working in _____ mode in Word, the new text replaces the existing characters.
   A. Edit
   B. Insert
   C. Overtype
   D. none of the above
5. When a Word paragraph is formatted with a _____, the first line of text begins at the left margin, and all other lines of the paragraph are indented to the right of the first line.
   A. first line indent
   B. hanging indent
   C. right indent
   D. none of the above

6. In an Excel worksheet, you can edit a formula cell by _____ .
   A. double-clicking the cell and then editing the formula in the cell
   B. selecting the cell and then editing the formula in the formula bar
   C. selecting the cell, pressing F2, and then editing the formula in the cell or in the formula bar
   D. all of the above
7. To prevent users from seeing personal data related to a file, _____ .
   A. inspect the document and remove hidden text
   B. save the document as a read-only document
   C. restrict access
   D. inspect the document and remove metadata
8. To preserve the visual appearance and layout of each page, save a Word document in a(n) _____ format.
   A. read-only compatible
   B. compatible
   C. PDF or XPS
   D. encrypted
9. The _____ is a unique identifier of each record in an Access table.
   A. primary key
   B. field property
   C. field data type
   D. field name
10. A _____ is a database object that enables you to organize, summarize, and print all or a portion of the data in an Access database.
    A. form
    B. report
    C. table
    D. query
11. When sorting data, _____ rearranges the numbers from the lowest value to the highest value.
    A. ascending order
    B. descending order
    C. reverse order
    D. MAX order
12. To convert a cell into multiple cells, _____ the cells.
    A. split
    B. merge
    C. join
    D. expand
13. To make it easy to add and delete multiple slides and rearrange the order of PowerPoint slides, switch to _____ view.
    A. Normal
    B. Slide Sorter
    C. Layout
    D. Notes Page
14. A _____ chart compares the sizes of portions as they relate to a whole unit.
    A. line
    B. pie
    C. column
    D. bar
15. When you _____ a graphic, you remove a part of the graphic that you don't want to show.
    A. layer
    B. resize
    C. crop
    D. scale

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. _____ is the revision marks and comments that appear in a document.
2. _____ are built-in, predesigned, and formatted document parts.
3. A(n) _____ is descriptive text that is displayed when you position the mouse pointer over a command or control in the application window.
4. A(n) _____ is a digital copy of a document.

5. A(n) _____ is a graphic representation of worksheet or table data.
6. The _____ feature enables you to cut off portions of a graphic that you do not want to show.
7. A(n) _____ is three or four characters automatically added to the filename when the document is saved.
8. In a formula, a(n) _____ is a symbol that indicates the mathematical operation to perform.
9. A(n) _____ contains column headings or field names in a data source, such as a table or spreadsheet.
10. When you _____ a row or a column, the locked area is visible as you scroll through the worksheet.
11. A cell reference that does not change when the formula is copied or moved to a new location is called a(n) _____ cell reference.
12. A(n) _____ is information and/or graphics that is printed in the top margin of each page.
13. A(n) _____ represents one intersection of a row and a column in a table or a worksheet.
14. _____ effects are animation settings used to draw attention to an object that is already visible on a slide in a PowerPoint presentation.
15. The Word feature _____ enables you to quickly find alternative words or synonyms for a word in your document.

PROJECTS

PROJECT 2–1

1. Start **Word**, and open the **Safari.docx** file from the drive and folder where your Data Files folder is stored. Save the Safari document as **Revised Safari**, followed by your initials. The document is a promotional flyer for visitors at the Madikwe Game Reserve, and the document will be printed using a duplex printing setting.
2. Change the page layout settings so that all margins are .5".
3. Several words are misspelled, and there are a few grammatical errors. Locate these errors, and make the necessary corrections. All occurrences of *Madikwe* are spelled correctly.
4. Find the first occurrence of *Big Five*. Change *Five* to **5**, and then add the following sentence immediately after that sentence:

   The Big 5 are the lion, elephant, rhino, buffalo, and leopard, which are all considered to be the most dangerous animals to hunt.
5. Search from the beginning of the document and find the phrase *constantly train*. This text appears twice in this article, so change this first occurrence so it is not used repetitively. Use the Thesaurus feature to find and replace the word *constantly* with a synonym.
6. Under the subheading *Wildlife and Ecosystem*, select all the italicized text and apply a bullet format. Then, indent all paragraphs in the document, excluding the subheadings and the bulleted list, with a .5" first line indent.
7. If necessary, display nonprinting characters. Position the insertion point in front of the paragraph marker under the subheading *Safari Options*, and then create a 3 × 5 table, and enter the following data in the table. Use the AutoFit feature so the column widths fit the content, and apply a table style. Adjust the alignment of the text within the cells as needed.

SAFARI NAME	DESCRIPTION	# DAYS AND NIGHTS
Bush Walk	A guided walking tour; approximately 3 miles	1 day
The Expedition	Combines hiking and camping for those who want to get close to nature	3 days, 2 nights
Photo Workshop	Photography instruction in prime wildlife locations; overnight stay in thatch roof guesthouses	4 days, 3 nights
Classic Experience	Morning, afternoon, and evening game drives in safari vehicle; lodge suites are ideal for families with children	3 days, 2 nights

8. In the article with the subheading *History*, format the two paragraphs in two columns of equal width, with a line between the columns. In the article with the subheading *Excellent Bird Watching and Wildlife Viewing*, format the three paragraphs of text in two columns of equal width. Apply justified alignment to all paragraphs under both subheadings.
9. In the *Excellent Bird Watching and Wildlife Viewing* article, insert the **Bird.jpg** picture file from the drive and folder where your Data Files folder is stored. Resize the picture so it is approximately 1.3" wide by 1.5" high. Apply square text wrapping and then position the picture at the left side of the first paragraph.

10. In the same article, insert the **Elephant.jpg** picture file from the drive and folder where your Data Files folder is stored. Resize the picture so it is approximately 2.5" wide by 2" high. Apply top and bottom text wrapping, and then position the picture in the second column below the last paragraph in the article. If necessary, reduce the size of the pictures so the two articles fit on the first page of the document. And, if necessary, insert a manual page break so that the subheading *Safari Options* displays at the top of page 2.
11. Position the insertion point at the end of the document, and insert the **Giraffe.jpg** picture file from the drive and folder where your Data Files folder is stored. Resize the picture so it is approximately 4" wide by 3" high. Apply the Tight text wrapping and position the picture on the right side of the bulleted list, aligned with the right margin. Add a black, 1 ½-point border to each of the three pictures.
12. Format the first subheading *History* using the font Cambria, 16 point. Add a double-line border above and below the paragraph, using a color that complements the colors in the pictures. Choose an appropriate border weight. Then add appropriate shading for the paragraph and center the text. Use the Format Painter to copy the paragraph formats to the three other subheadings.
13. Preview the document in Backstage view. Insert a manual page break, and make adjustments to the margins and the picture sizes as needed so the entire document fits on two pages, with two articles on each page. If necessary, change the table style colors to complement the heading formats.
14. Save the changes. Then save the document in PDF format as **Revised Safari**. Close the PDF file and the Word document.

PROJECT 2–2

1. Start **Excel**, and open the **Travel Data.xlsx** file from the drive and folder where your Data Files folder is stored. Save the Travel Data workbook as **Updated Travel Data**, followed by your initials.
2. Rename the *Sheet1* tab **Expenses**. Rename the *Sheet2* tab **Hours**.
3. In the *Expenses* worksheet, insert a new column to the left of the *Fuel* column. Add the heading **Ent.** at the top of the new column. *Ent.* is an abbreviation for *Entertainment*, which refers to expenses incurred for entertaining clients, such as taking them to dinner.
4. Click cell **F1**, and type the heading **Total**. Insert a new row at the top of the worksheet. Select the range **A1:F1**, and merge and center the cells. Type the heading **Monthly Expense Report**. Select the first two rows, and apply the bold format.
5. Click cell **A14**, and fill down the cell contents through cell **A32** so all the dates in the month of June are displayed.
6. If necessary, start **Word**. In Word, open **Travel Notes.docx** from the drive and folder where your Data Files folder is stored. This document simulates handwritten notes for incurred expenses. Enter this new data in the *Expenses* worksheet. (*Hint*: If you have a large monitor, you can display the Excel and Word application windows side by side.) When you have entered all the data, close the Word document.
7. Select the range **A3:A32**, and then apply the Short Date format *(6/1/2016)*. Select the range **B3:F34**, and apply the Currency number format.
8. Click cell **F3**, and enter a formula to calculate the sum of the values in the range B3:E3. Then, fill the formula down to cell F34. Many adjacent cells are empty, so do not be concerned if the error flag appears with the results.
9. Click cell **A34**. Type **Total**, and format the text bold. Click cell **B34**, and enter a formula to calculate the sum of the values in the range B3:B32. Then, fill the formula to the right for the range C34:E34. AutoFit the column widths to fit the cell contents.
10. Switch to the *Hours* worksheet. Delete column B. Then, select the range **B2:B36**, and increase the number of decimal places to 2.
11. Enter some formulas to calculate the data recorded for the month:
    a. Click cell **A32**, and type **Total days worked**. Click cell **B32**, and enter a formula to count the number of cells in the column that contain numbers in the range B2:B31.
    b. Click cell **A33**, and type **Total hours worked**. Click cell **B33**, and enter a formula to calculate the total number of hours worked for the range B2:B31.
    c. Click cell **A34**, and type **Fewest hours worked**. Click cell **B34**, and enter a formula to calculate the fewest hours worked in one day in the range B2:B31.
    d. Click cell **A35**, and type **Most hours worked**. Click cell **B35**, and enter a formula to calculate the most hours worked in one day in the range B2:B31.
    e. Click cell **A36**, and type **Average daily hours worked for 21 days**. Format the text to wrap in the cell. Click cell **B36**, and enter a formula to calculate the average daily hours for the 21 working days. (*Hint*: You cannot use the AVERAGE function to perform this calculation; you must create your own formula.)
12. AutoFit the column widths to fit the cell contents.
13. Save the changes, and close the workbook.

PROJECT 2–3

To complete Steps 6 and 7, you must have an Internet connection.

1. Start **PowerPoint**, and open **The Climb.pptx** file from the drive and folder where your Data Files folder is stored. Save the The Climb presentation as **The Everest Climb**, followed by your initials.
2. Delete the fourth slide. Then move slide 6 to follow slide 3.
3. Add a new slide with the Title and Content layout after slide 3. Type the title **Risky Business**. In the lower placeholder text box, type **1 out of 10**. Increase the lower placeholder text font size to 96 point. Remove the bullet format, and center the text.
4. Go to slide 5. Change the title *Risky Business* to **What happens?**.
5. Go to slide 2. Insert the **Mountain.jpg** picture file from the drive and folder where your Data Files folder is stored. Resize the picture to fill the slide. Send the picture to the back so the title *29,035 feet high* appears at the top of the photograph. Change the font color to white so you can easily read the title.
6. Go to slide 3. Change the slide layout to Two Content. Position the bulleted list on either the left or right side of the slide. On the other side of the slide, insert an online picture from the Office.com Clip Art gallery that helps describe the words in the bulleted list. For example, insert an image of a calendar or the number 6. Resize and reposition the image as needed.
7. Go to slides 5 and 6. Insert online pictures that help to describe the text in the bulleted list, such as blowing snow, a thermometer, or a mountain climber on the side of the mountain. Resize and reposition the pictures as needed. Remember, you can remove picture backgrounds and format pictures with styles, colors, and special effects.
8. Go to slide 7. Edit the 2001 record so it reads **2010: Youngest climber: Age 13, Jordan Romero**, and switch the order of the records so they are in chronological order. Convert the bulleted items to a SmartArt graphic. If necessary, decrease the font size so each item fits on one line. If time permits, research the Internet and see if any of the other records need to be updated.
9. Apply a design and variant or a custom background to all the slides. If you choose to apply a theme, make any necessary adjustments to reposition and resize slide titles and objects after the new design is applied.
10. Format custom animations for the objects and text boxes on each slide. Be sure to set the trigger and speed for each animation. Format a slide transition for one or more slides. Be sure to set the transition speed.
11. Go to slide 6. Type **There is a short window of time in the spring to climb the mountain.** in the Notes pane.
12. Add an online audio clip of a strong wind sound from the Office.com Clip Art gallery and select the settings for how and when the audio clip will play.
13. Preview the slide show, and make any necessary changes so the content flows smoothly. Make sure the animations and transitions are effective.
14. Save the changes, and close the presentation.

PROJECT 2–4

1. Start **Access**, and open the **Species.accdb** file from the drive and folder where your Data Files folder is stored. Save the Species database as **Updated Species**, followed by your initials.
2. Open the **Species** table. Adjust the widths of all the columns so you can see the complete entries in every field column.
3. Show the *Species* table in Design view, and rearrange the field names so the *Common Name* field appears in the list before the *Group* field name. Save the changes, and close the *Species* table.
4. Create a form for all the fields in the Species table, in the same order they appear in the table. Name the form **Species Form**.
5. Use the form to enter the following two new records, and then close the form.

Common Name:	**Mandarin duck**
Group:	**Birds**
Species Name:	**Aix galericulata**
Order:	**Angeriformes**
Family:	**Anatidae**
Habitat:	**Eastern Asia**

Common Name:	**Grant's zebra**
Group:	**Mammals**
Species Name:	**Equus burchelli**
Order:	**Perissofactyla**
Family:	**Equidae**
Habitat:	**Southeastern Africa**

6. Go to record 22, *Arctic wolf*. In the *Species Name* field, change the entry to **Canis lupus tundranum**. Close the form.
7. Open the **Species** table. In the *Order* field, search for all occurrences of *Arteodactyly*, and replace all occurrences in the current field with **Artiodactyla**.
8. Use the Query wizard to create a simple query based on the Species table:
   a. Include the *Common Name, Group, Species Name*, and *Habitat* fields, in that sequence.
   b. Name the query **Species Query**.
   c. Add the criteria **Mammals** in the Group field.
   d. All fields except *Group* should show in the query.
9. Use the Report Wizard to create a report based on the *Species* table:
   a. Include the *Common Name, Group, Habitat, Family, Species Name*, and *Order* fields, in that sequence.
   b. Do not group the report.
   c. Sort the report by the *Common Name* field in ascending order.
   d. Choose the Tabular layout with landscape orientation.
   e. Name the report **Species Report**.
10. Close all the objects, and then close the database.

INTEGRATED PROJECT

You volunteer at the local Rails-to-Trails organization, which converts old, unused railroad beds into trails for public use. These trails can be used for a variety of activities including walking, jogging or running, biking, and in-line skating. The organization has asked you to help communicate information about rail trails in your area. You want to prepare an announcement to distribute throughout the community, and create a slide show to present information about the organization at a community meeting next week.

JOB 2–1

You decide to begin by organizing some data in an Excel spreadsheet.

1. If necessary, start **Excel**. Open the **Survey.xlsx** file from the drive and folder where your Data Files folder is stored. Save the Survey worksheet as **Revised Survey**, followed by your initials.
2. Click cell **C4**. Enter a formula to calculate the percentage of positive responses. (*Hint*: Divide the number of positive responses by the total surveyed. In the equation, the value for the total surveyed needs to be an absolute reference.)
3. Apply the Percent Style number format to cell C4. Then, fill the formula down through cell C8.
4. Copy the formula in cell C4 to the Clipboard, and then paste the formula in cells E4 and G4. Then, fill the formula down in both of those columns, and apply the Percent Style number format as necessary.
5. Hide columns B, D, and F. Then select rows 3 and 4. Create a 3-D pie chart. If necessary, add a legend and data labels. Format data labels for Best Fit. If necessary, change the color, and increase the font size for the legend and the labels to 14 point so the text can be read easily. Apply the bold format to the labels. In the chart title, change *crime rate* to **Crime Rate**.
6. Position the chart below the data.
7. Select rows 3 and 5, and create a second 3-D pie chart, using the same settings described in Step 5. In the chart title, change *home value* to **Home Value**. Move the chart to a new worksheet and name the new worksheet **Home Value**.
8. Change the *Sheet1* name to **Crime Rate**.
9. Save the changes to the workbook, and leave the workbook open for the next Job.

JOB 2–2

A new section of a popular rail trail is about to open, so the timing is perfect to provide general information to community residents about rail trails. You already created a draft of an announcement, and you asked another member of the organization to review it and provide feedback.

1. If necessary, start **Word**. Open the **Scenic Trail.docx** file from the drive and folder where your Data Files folder is stored. Save the Scenic Trail document as **Revised Scenic Trail**, followed by your initials.
2. Navigate through the revisions and comments, and review the markup. Accept all the revisions and delete the comments. Toggle off Track Changes. Scroll down through the document, and correct any errors in spacing and punctuation.
3. Select the title at the top of the document. Apply the bold format, and change the font size to 14 point.
4. Select the third paragraph in the body of the document beginning *Rail trails such as…* and move the paragraph so it follows the introductory paragraph.
5. Find every occurrence of *rail-trail*, and replace the hyphen with a blank space. Find the occurrence of *14,000*, and change it to **15,000**.
6. If necessary, open the **Revised Survey.xlsx** workbook from your solution files. Select the chart on the *Home Value* worksheet and copy it to the Clipboard. Switch back to the Revised Scenic Trail document. Position the insertion point at the beginning of the last paragraph of text (beginning *Not only are rail trails*). Paste the chart into the Word document.
7. Resize the chart so that it is approximately 4" wide and 3" high. Format the chart for square text wrapping. Change the zoom setting so you can see the entire page. Position the chart in the lower-right corner of the page. Make sure the entire document fits on one page. Resize the chart if necessary.
8. Save the changes to the Word document. Leave the document and the workbook open for the next Job.

JOB 2–3

The next step is to prepare the slide show for next week's community meeting. You will need access to the Internet to complete Step 2.

1. If necessary, start **PowerPoint**. Open the **Rail Trail.pptx** file from the drive and folder where your Data Files folder is stored. Save the Rail Trail presentation as **Revised Rail Trail**, followed by your initials.
2. Instead of adding words to the presentation, add visuals to deliver the message. Tips in the Notes pane for each slide will help you choose appropriate images. Insert online pictures from the Office.com Clip Art gallery on slides 2–6.
3. Replace the tips in the Notes pane on each slide with points you want to emphasize during the presentation. Refer to the **Revised Scenic Trail.docx** document and use it as a guide.
4. Insert a new slide after slide 5 with the blank layout. Into the new slide, copy and paste the Impact on Home Value chart from the Revised Survey workbook in your solution files. Resize the chart to fill the slide. If necessary, enlarge the chart title, legend text, and label text.
5. Select the image on slide 7, and create a hyperlink to slide 3 in the same presentation.
6. Add a design or a custom background to all the slides. Remove backgrounds to images, apply borders and effects to images. Check each slide and resize and reposition images and text as needed.
7. Add custom animations and/or sounds for the images to appear on the slide. If desired, also format one or more slide transitions.
8. Preview the slide show, and make any necessary edits to the triggers and timing for the animations and transitions. (When you click the image in Slide Show view, slide 3 will open and you can use this slide for the closing comments in the presentation. Then to exit the presentation instead of advancing to slide 4, press Esc.)
9. Save the changes to the presentation, and close the presentation, the Word document, and the Excel workbook.

JOB 2–4

The final step is to prepare mailing labels so you can mail copies of the announcement to other volunteers in the organization who will then assist in distributing the copies of the announcement throughout the community.

1. If necessary, start Access. Open the **Volunteers.accdb** file from the drive and folder where your Data Files folder is stored. Save the Volunteers database as **Updated Volunteers**, followed by your initials.
2. Use the Label Wizard to create mailing labels based on the *Volunteers* table:
   a. Create labels for the Avery C2160 label type.
   b. Change the font to Comic Sans MS, 12 point, Normal weight.
   c. Add the fields to the prototype label for the appropriate mailing format.
   d. There is no need to sort the records.
   e. Name the report **Volunteer Mailing Labels**.
3. Review the labels in Print Preview to make sure they look correct, and make any necessary changes.
4. Close the database, and then close all open applications.



Estimated Time for Module: 8.5 hours

MODULE 3

LIVING ONLINE

LESSON 25 1.5 HRS.
Network Fundamentals

LESSON 26 1.5 HRS.
Communication Services

LESSON 27 1 HR.
Communications and Collaboration

LESSON 28 1.5 HRS.
Using the Internet and the World Wide Web

LESSON 29 1 HR.
Web Content

LESSON 30 1 HR.
Technology and Society

LESSON 31 1 HR.
Computer Safety and Ethics

LIVING ONLINE

LESSON 25
Network Fundamentals

3-2.2.1	3-2.2.4	3-2.3.2
3-2.2.2	3-2.2.5	3-2.3.3
3-2.2.3	3-2.3.1	

LESSON 26
Communication Services

3-3.1.1	3-3.1.2	3-3.1.3

LESSON 27
Communications and Collaboration

3-1.1.1	3-4.1.1	3-4.1.5
3-3.2.1	3-4.1.2	
3-3.2.2	3-4.1.3	
3-3.2.3	3-4.1.4	

LESSON 28
Using the Internet and the World Wide Web

3-1.1.1	3-1.2.4	3-1.2.10
3-1.1.2	3-1.2.5	3-2.1.1
3-1.1.3	3-1.2.6	3-2.1.2
3-1.2.1	3-1.2.7	3-2.1.3
3-1.2.2	3-1.2.8	3-2.1.4
3-1.2.3	3-1.2.9	

LESSON 29
Web Content

3-1.2.8	3-6.1.2	3-6.2.5
3-4.2.3	3-6.2.1	3-6.2.6
3-4.2.5	3-6.2.2	3-6.3.1
3-4.2.7	3-6.2.3	
3-6.1.1	3-6.2.4	

LESSON 30
Technology and Society

3-1.1.1	3-3.2.1	3-6.1.1
3-3.1.1	3-3.2.2	3-6.1.2

LESSON 31
Computer Safety and Ethics

3-4.2.1	3-4.2.6	3-5.2.3
3-4.2.2	3-5.1.1	3-5.2.4
3-4.2.3	3-5.1.2	3-5.2.5
3-4.2.4	3-5.2.1	
3-4.2.5	3-5.2.2	



Estimated Time:
1.5 hours

LESSON 25

Network Fundamentals

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Define communication networks and identify the differences between public and private networks.
- Describe common hardware and software components in a computer network.
- Identify network types.
- Identify the benefits of a network.
- Evaluate the risks of network computing.
- Identify and resolve common networking connection problems.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

address
cable modem
client
communications protocol
digital subscriber line (DSL)
Domain Name Server (DNS)
Ethernet cable
gateway
hub
IP address
Media Access Control (MAC)
modem
Network Interface Card (NIC)
packet switching
public switched network (PSN)
public switched telephone network (PSTN)
router
server
switch
T-1 line
Virtual Private Network (VPN)

Microsoft product screenshots used with permission from Microsoft Corporation.

Networking means communicating, and modern society depends daily on communication networks to exchange information and share ideas. Users connect to networks quickly, or even automatically, and then they access data almost instantly. But have you ever thought about what goes on behind the scenes to make this possible?

Communication Networks

Society uses many different networks for communication purposes. The networks are used to transmit voice, data, video, and Internet traffic. Multi-service networks are capable of transmitting a combination of these services on the same system. Some communication networks support public use, and some networks are designed for private use. See **Figure 25–1**.



pictafolio/iStockphoto

FIGURE 25–1 Sharing Information

Comparing Public vs. Private Networks

IC3
3-2.2.1
3-2.2.5

VOCABULARY
public switched network (PSN)
public switched telephone network (PSTN)

Public networks offer access to the general public with a connection to other networks. For example, coffee shops, airports, and hotels provide public networks so that guests can access other networks, typically the Internet. The Internet is a public global network that enables users worldwide to connect and exchange information.

A ***public switched network (PSN)*** is a common carrier network that provides connections among public users. The term PSN is usually applied to the ***public switched telephone network (PSTN)***, the international collection of interconnected voice-based public telephone networks. To create the connection, the system sets up a dedicated channel (or circuit) between two points for the duration of the call. The calls are routed on all levels: local, regional, national, and international. PSTN was originally created to support one-to-one voice communications using analog transmissions, but the network today is largely digital and includes services for both cellular and landline phones. See **Figure 25–2**.



Prehranac/iStockphoto.com

FIGURE 25–2 The PSTN routes calls on all levels

Many, but not all, local Internet Service Providers (ISPs) are connected to the PSTN. ISPs employ a range of more advanced technologies to enable consumers to connect to a network. For example, Integrated Services Digital Network (ISDN) can send voice, video, and data over digital or analog telephone lines. Voice over Internet Protocol (VoIP) is a system that converts your telephone signal into digital and uses the Internet to deliver voice communications.

QUICK TIP

VoIP is also referred to as Internet Telephony.

Private networks are owned by one or more establishments for their exclusive use. Private networks are commonly used in offices and homes so that multiple computers can share printers, files, data, and programs. Private networks restrict access, and only authorized users can connect to a private network. For example, organizations use private networks to interconnect locations such as production sites, retail stores, office locations, and remote offices in order to share computer resources. Users must enter user names and passwords to gain access to the network.

Virtual Private Network (VPN) is a network service that enables remote users to use a public network (usually the Internet) to access their private networks (usually a home or office network). VPN is a technology that encrypts incoming and outgoing data and uses a secure connection across a public network. VPN services are commonly used by employees who work at home, on the road, or in a branch office of a corporation.

VOCABULARY

Virtual Private Network (VPN)

3-2.2.4

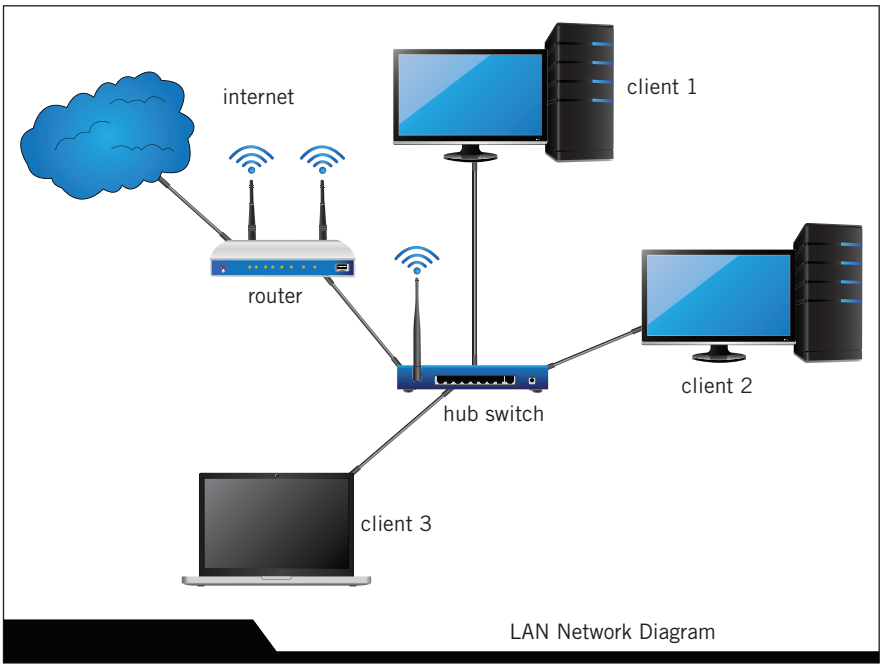
Understanding Types of Networks

The design of a network, including how it is set up physically, is referred to as the architecture. Networks can be categorized by the scope of the network (the area covered by the connected devices) and the design of the communication methods. Networks can have wired or wireless connections, or both. **Table 25–1** describes several types of networks.

TABLE 25–1 Network Types

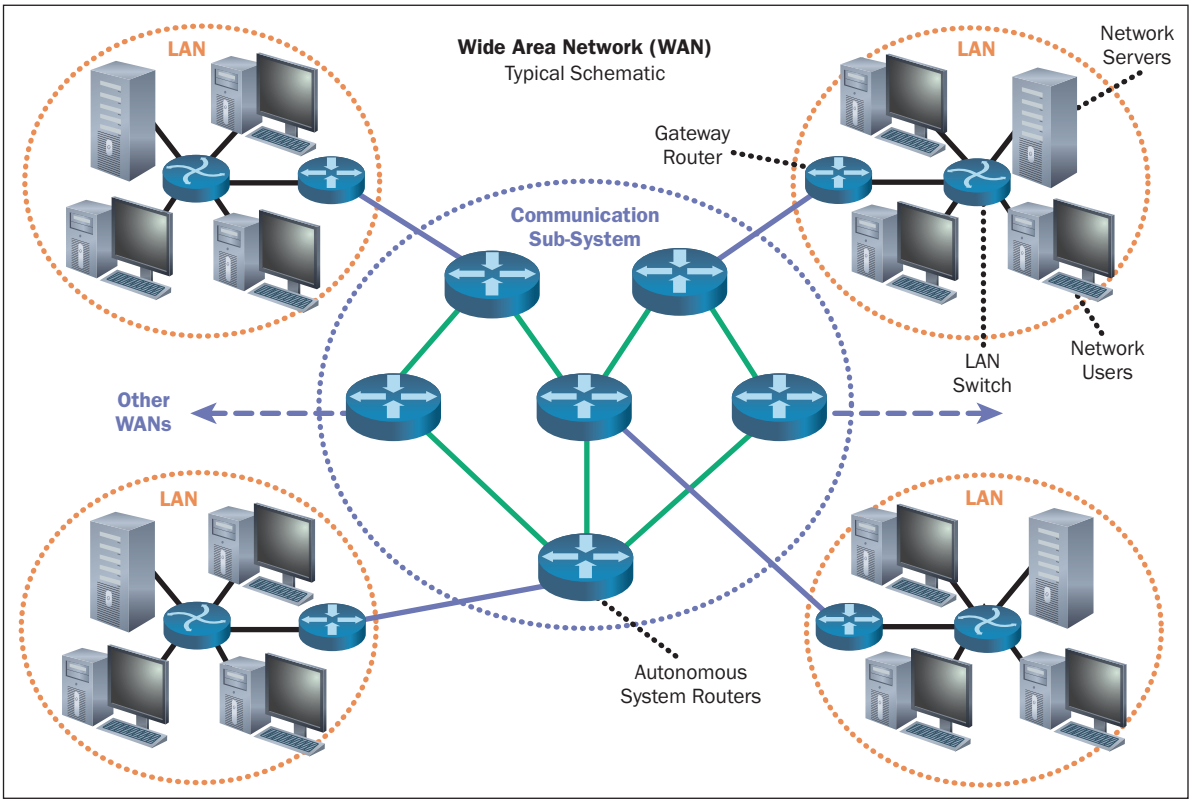
NETWORK	DESCRIPTION
Local area network (LAN)	Connects computers, workstations, and other devices that are relatively close to each other, such as printers and scanners within a confined space, such as an office building, school, or home.
Wireless local area network (WLAN)	A variation of the LAN without physical wires to connect devices. To communicate on a WLAN, the computer and other devices that access the network must each have a wireless device or built-in wireless capability. WLANs connect devices that are very close to each other, such as homes and small offices. See **Figure 25–3**.
Wide area network (WAN)	A network that contains a substantial number of computers and covers a large geographical area (a state, country, or even the world). Most WANs consist of two or more LANs. The largest WAN is the Internet. Users usually connect through a public network such as a telephone system, leased lines, or satellites. See **Figure 25–4**.
Client/server	In this type of architecture, one or more computers on the network act as a server. The server manages network resources, such as a mail server, a database server, a Web server, and so on. The computer providing the service is the server, and the computer that requests and uses the service is the client.
Peer-to-peer (P2P)	In this network design, all the computers are equal and no computer is designated as the server. All computers can act both as a client and a server. Users on the network each determine what files on their computer they share with others on the network.
Internet	A worldwide system composed of thousands of smaller networks. An Internet Service Provider (ISP) provides connection to the Internet. The Web and electronic mail are two of the more popular components of the Internet.
Intranet	This type of network is designed for the exclusive use within an organization. Many businesses have implemented intranets so that employees can access documents such as handbooks, employee manuals, newsletters, employment forms, and other relevant company documents.
Extranet	Similar to an intranet, this type of network allows specific users outside of the organization access to internal information systems in an intranet.

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Ohmega1982/iStockphoto

FIGURE 25–3 A local area network (LAN)



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FIGURE 25–4 A wide area network (WAN)

Identifying Network Components

Many components and technologies work together so that networked computers can share data and access resources. The components vary depending on the network size and the transmission methods.

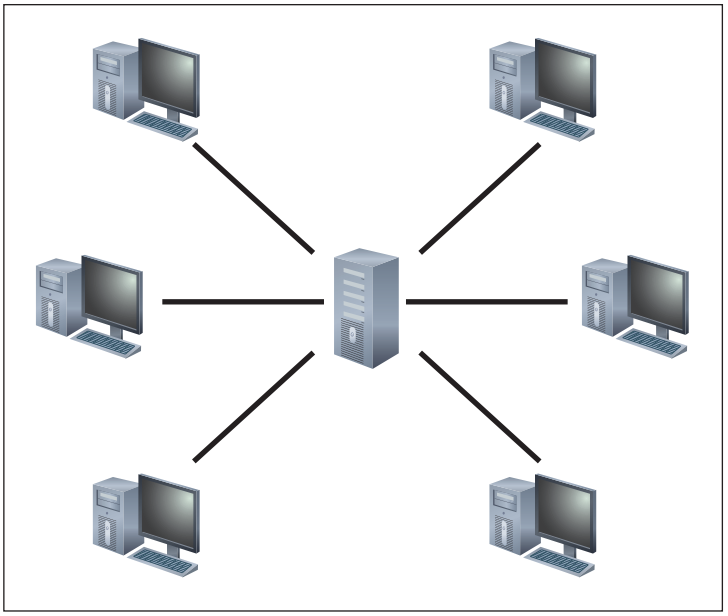
When most people think of networks, they envision something fairly complicated. However, at the lowest level, networks are not that complex. In fact, a computer network can be as simple as two computers linked together. The network can also include printers, scanners, and other devices to communicate and share information. As the size of a network increases and more devices are added, installing devices and managing the network becomes more technical. Even so, networking concepts and terminology basically remain the same, regardless of size or type.

VOCABULARY

server

client

A ***server*** provides a service to one or many clients, such as sharing files, folders, and printers. In most instances, the server is a high-speed computer with considerable storage space. Depending on the size of the network, several servers might be connected. A ***client*** accesses the shared resources, services, and programs provided by the server. Access to the server can be through desktop or laptop computers, notebooks, tablets, handheld devices, game systems, and other similar electronic devices. See **Figure 25–5**.



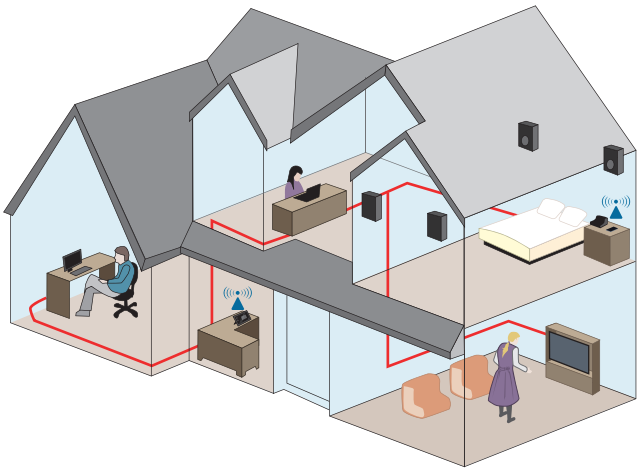
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FIGURE 25–5 A server and multiple clients

A computer network requires both hardware components and software components.

Hardware Components

Devices can connect to a network via wired or wireless connections. Wired media involves cables and wireless media types include satellites, radio, Bluetooth, and Wi-Fi. **Figure 25–6** shows a home network with both wired and wireless connections.



(a) A home network connects your PCs and other devices so they can communicate



(b) The telephone network functions much like your home network except on a larger scale

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FIGURE 25–6 Home network with wired and wireless connections

Commonly used communication devices are described next.

Modems

VOCABULARY

modem

cable modem

digital subscriber line (DSL)

Ethernet cable

A ***modem*** enables a computer to transmit data over telephone lines. Computer information is stored digitally (in binary code of 0s and 1s), whereas information sent over telephone lines is transmitted in the form of analog waves. See **Figure 25–7**.

- A traditional modem is often referred to as POTS (short for Plain Old Telephone Service).
- A ***cable modem*** uses existing cable television lines to send and receive data. The bandwidth, which determines the amount of data that can be sent at one time, is much greater with a cable modem than with the older technology of a dial-up modem. For this reason, cable modems are used to deliver broadband Internet access, which is a high-speed connection to the Internet.
- A ***digital subscriber line (DSL)*** modem uses an Internet connection technology that provides for the transfer of information to a computer at a high-speed bandwidth over ordinary copper telephone lines. A DSL service can transmit both data and voice at the same time. Like cable modems, DSL modems are widely used to provide broadband Internet access.

ABOVE AND BEYOND

The word modem is an acronym for "modulate-demodulate," which means to convert analog signals to digital and vice versa.

ABOVE AND BEYOND

Broadband Internet is also available through wireless, satellite, fiber-optic technology, and Broadband over Powerline (BPL). Broadband is often bundled with your phone service, satellite, or cable TV package.

ABOVE AND BEYOND

Worldwide Interoperability for Microwave Access (WiMAX) is a wireless technology that can deliver maximum speeds to your cell phone, home computer, or car. WiMAX is an alternative to cable and DSL, especially for users in areas that cable and DSL service providers do not serve. It is also used to connect mobile computer users to the Internet across cities and countries. You can use a WiMAX USB modem to connect to a WiMAX network.



Piotr Malczyk/Shutterstock

FIGURE 25–7 Cable modem

Cable Media

There are three types of cable media: coaxial cable, twisted pair, and fiber optic cable. An ***Ethernet cable*** is the most common type of connection computers used in a local area network (LAN). An Ethernet port looks much like a regular phone jack, but it is slightly wider. This port can be used to connect your computer to another computer, to a local network, or to an external DSL or cable modem.

T-1 Line

A ***T-1 line*** is a type of fiber-optic telephone line that can transmit voice and data at the same time. T-1 lines are ideal for businesses because the line is a dedicated line and not shared with other businesses. Hence, the connection is more secure and it doesn't get bogged down.

VOCABULARY

T-1 line

hub

switch

router

Hub

A ***hub*** is a device that joins all the devices of a network together. Hubs are commonly used to connect segments of a LAN. Every network device connects directly to the hub through a port. When a frame of data arrives from a connected device, the hub forwards the frame to all the other connected devices.

Switch

A ***switch*** is a device that performs the same tasks as a hub, but it works much faster. Instead of sending the frame of data to all connected devices, a switch filters the target for the frame and forwards the frame only to a specific device in the LAN. Switches improve the response time and dissect irrelevant traffic from the segment. Switches have replaced most hubs in Ethernet networks. A switch can be a hardware or a software component, or a combination of both.

ABOVE AND BEYOND

In discussions about networks, someone might mention bridges, which are also network components. A bridge connects two segments of a network and monitors the data traffic on both sides of the network. Bridges can be wired or wireless, but they are seldom used in modern networks. If you use the network bridge software built into Windows, you don't need to buy additional hardware.

Router

A ***router*** directs the flow of data from a local area network (LAN) to another network connection, either a LAN or a WAN. For example, a router links a computer in a home network to the Internet. The router breaks down the data into packets and identifies the best path for forwarding the packet to the specific target. If you have a router, you do not need a hub or switch. See **Figure 25–8**.

ABOVE AND BEYOND

Some modems come with built-in wireless routers.



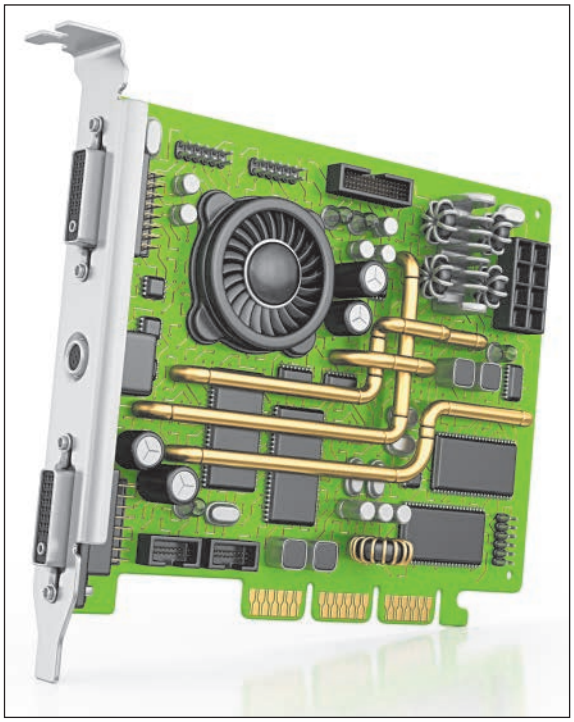
VectorWerk/iStockphoto

FIGURE 25–8 Wireless router

Network Interface Card (NIC)

VOCABULARY
Network Interface Card (NIC)
communications protocol

A ***Network Interface Card (NIC)*** makes the electrical and electronic connections between a computer and a network. NICs are usually built into the computer motherboard, or they are installed as an expansion card. NICs are used to set up both wired and wireless connections. A wired connection uses a cable; a wireless connection uses a small antenna and communicates via radio waves. See **Figure 25–9**.



pagadesign/iStockphoto

FIGURE 25–9 Network Interface Card (NIC)

IC3
3-2.2.2
3-2.2.3
3-2.3.3

Software Components

Software is used to set up, manage, and monitor communication networks. The application or program provides remote access to networks and the tools you need to transmit data in the required formats. Commonly-used software components are described next.

Protocols

In order for computers to communicate, they must use a protocol. A ***communications protocol*** is a description of the rules computers must follow to facilitate device identification and data transfer.

The most common communications protocol is Transmission Control Protocol/Internet Protocol (TCP/IP), used for transporting data between computers on the Internet. TCP takes care of the communication between your application software (browser) and your network software. IP takes care of the communication with other computers.

Operating Systems

Operating systems often contain built-in services that support network protocols and include special functions for connecting computers and other devices into a network. The network operating system software and network versions of software applications are stored on the server. For example, a print server manages the printing and a database server manages a large database.

Three of the more popular server operating systems are Microsoft Windows, Mac OS X, and Linux. The selection of an operating system is determined by several factors including how the server will be accessed, security issues, whether the server will host a database, whether forms will be processed, which applications will be used, and other individual aspects.

Addressing

VOCABULARY

address

Media Access Control (MAC)

IP address

Domain Name Server (DNS)

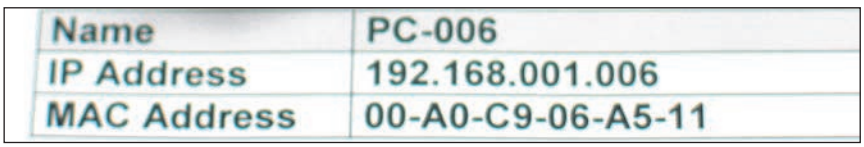
gateway

packet switching

Each computer or device on a network has an ***address***, a unique identifier. The purpose of network addressing is two-fold. Addresses provide information for the identification of a device on the network, and addresses enable users to locate other devices that are connected to the network.

Every NIC has a ***Media Access Control (MAC)***, an address for communications on the physical network segment. A MAC address is assigned by the manufacturer of the device.

Devices connected to a TCP/IP network are assigned an IP address. An ***IP address*** identifies the host device and the network to which it belongs. IP addresses are usually assigned by the network administrator or the Internet service provider. See **Figure 25–10**.



Hans-Joachim Roy/Shutterstock

FIGURE 25–10 MAC address and IP address

Most networks use the Internet Protocol (IP) technology to share data and resources. Before a computer can access data, the computer address must be translated into an IP address. When you enter a Web address in a browser, the Internet Service Provider accesses a ***Domain Name Server (DNS)***, which maintains a directory of domain names and their correlated IP addresses. The DNS translates the Web address to an IP address and directs your Internet connection to the Web site.

Gateways

A ***gateway*** connects networks using different communications protocols so that information can be passed from one network to the other. The gateway converts data to a form that is compatible with the destination network and then transmits the data. For example, in homes the gateway to the Internet is the Internet Service Provider. A network gateway can be software, hardware, or a combination of both.

Packet Switching

Most networks use packet switching techniques to send and receive data. ***Packet switching*** splits data into manageable packets (small pieces), allowing a more efficient flow in the transmission of the data. The NIC breaks down the data into packets before transmitting it to the hub. After the data packets are transmitted to the destination device, the NIC on the destination device puts the packets back together.

Identifying the Benefits of a Network

Computer networks are an integral part of our lives. Many changes have occurred in our society in the last several years because of the Internet and other network capabilities. See **Figure 25–11**.



abalcazar/iStockphoto; TARIK KIZILKAYA/iStockphoto; killerbayer/iStockphoto; dmbaker/iStockphoto

FIGURE 25–11 Network benefits

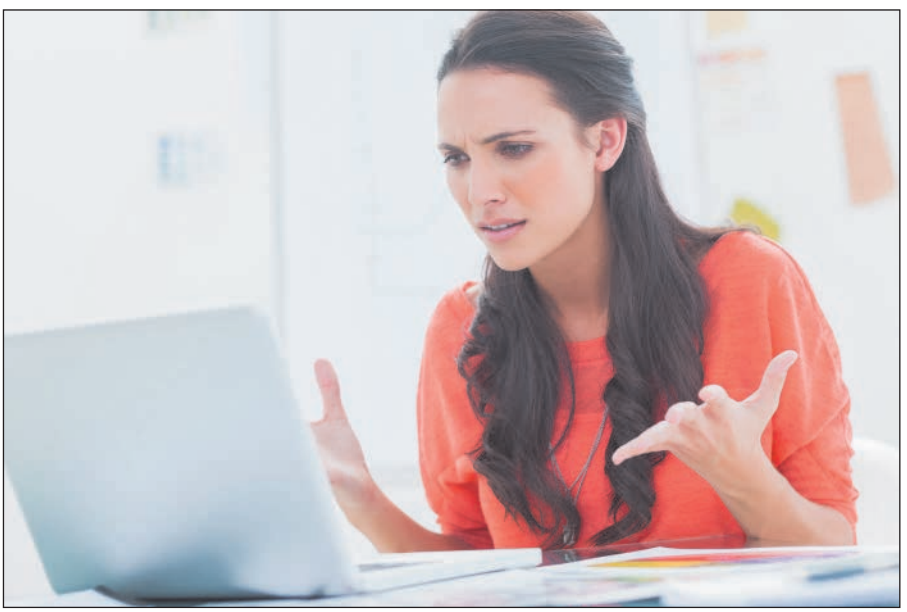
Benefits of using networks are listed below.

- Enhanced communications: Electronic mail, text messages, social media, face-to-face, and other electronic communications have changed the way the world interacts.
- Information sharing: Users around the world can connect to each other to access, share, and exchange information. Authorized users can access computers on the network to share information, data, and other resources. People share information through special group projects, news groups, databases, blogs, Web casts, Internet telephony, instant messaging, social media, and so on.
- Searching and Researching: Before the Internet, students had to make a trip to the library and search for information in encyclopedias. Travelers had to use printed maps to get directions for destinations. Information is now easily accessible from a computer or a mobile device. The Internet provides an astronomical number of resources for finding information such as news, locations, directions and maps.
- E-commerce: The Internet enables business owners to run their businesses online from desktop computers, laptops, tablets, or smart phones. Not only can businesses market their products and services, they can also complete sales transactions and shipping orders using Internet connections.
- Online training: Online courses are convenient and offer flexibility. You can learn at your own pace and complete the training on your own schedule. You can remain competitive in the workplace without taking time off from work. You can also save money because you don't have the costs of traveling to and from campus.

- Telecommuting: Not only does the ability to work from your home office save time traveling, it also saves expenses for transportation. Communication networks enable you to share files and connect with colleagues via video and conference calls and Web casts.
- Collaborative environment: A shared environment enables users to exchange files and collaborate on group projects by combining the power and capabilities of diverse equipment and software, thus increasing personal productivity.
- Hardware sharing: It is not necessary to purchase a printer or a scanner or other frequently used peripherals for each computer. Instead, one device connected to a network can serve the needs of many users.
- Software sharing: Instead of installing software on every computer, it can be installed on the network server. All of the users can then access the program from this one central location. Software sharing saves money because companies can purchase a site license for their users. This practice is less expensive than purchasing individual software packages, and updating software on the server is much easier and more efficient than updating it on individual computers.
- Entertainment: Networks facilitate many types of games and entertainment, and the Internet also offers many sources of entertainment. Many home networks that are set up for entertainment and gaming across wide area networks, such as the Internet, have become popular.

Evaluating the Risks of Networked Computing

As with any technology, you should also consider the disadvantages of using a network. The security of a computer network is challenged every day. See **Figure 25–12**.



wavebreakmedia/Shutterstock

FIGURE 25–12 Network risks

- Privacy: As data traffic flows through a number of systems and networks, computers are vulnerable to unauthorized access. Hackers steal services and information.
- Malfunctions and system failures: Natural disasters such as storms and fires, as well as electrical disturbances such as blackouts can cause server malfunctions, and as a result, users temporarily lose access to network resources, such as shared files and printers.
- Malicious code: Network computers are vulnerable to viruses, worms, Trojan horses, etc., which can cause equipment malfunctions and system failures. Malware protection helps alleviate these issues.
- Individual loss of autonomy: Networks can play a part in taking away an individual's autonomy by controlling which software programs are accessible, and keeping a record of how the computer is used and what sites are accessed.
- Network faults: Network equipment problems can result in loss of data and resources.
- Setup and management costs: Setting up a network requires an investment in hardware and software. Ongoing maintenance and management of the network requires the care and attention of a least one IT professional.



3-2.3.1
3-2.3.2

Solving Network Connection Problems

We live in a society that depends on communication networks for daily activities like work, entertainment, education, social interaction, traveling, and anything else that we have to do. It is very frustrating when we cannot connect to the Internet or access shared files or a shared printer. Solving hardware or software issues may be complex and require technical support. However, some connection problems such as physical connections and network settings are easy to identify and fix. Obviously, you should first check the physical connections. Make sure all cables are properly connected between your computer and modem/router.

If everything seems to be connected correctly, power down all the devices, and unplug the power to your router and modem. Wait about 10–15 seconds and then plug in the router and modem and turn your computer on again.

If that doesn't solve the problem, Windows provides troubleshooter wizards to help you diagnose and repair specific network problems. After diagnosing a problem, the wizard may fix the problem automatically, or the wizard may provide suggestions to fix the problem, such as search and help support, acquiring remote assistance, or online support. To access the troubleshooter wizards, you may need to have administrator access.

Step-by-Step 25.1

1. Open the **Start** screen. Type **Control Panel**. The text you entered displays in the *Search* text box. Press **Enter** to open the Control Panel shown in **Figure 25–13**.

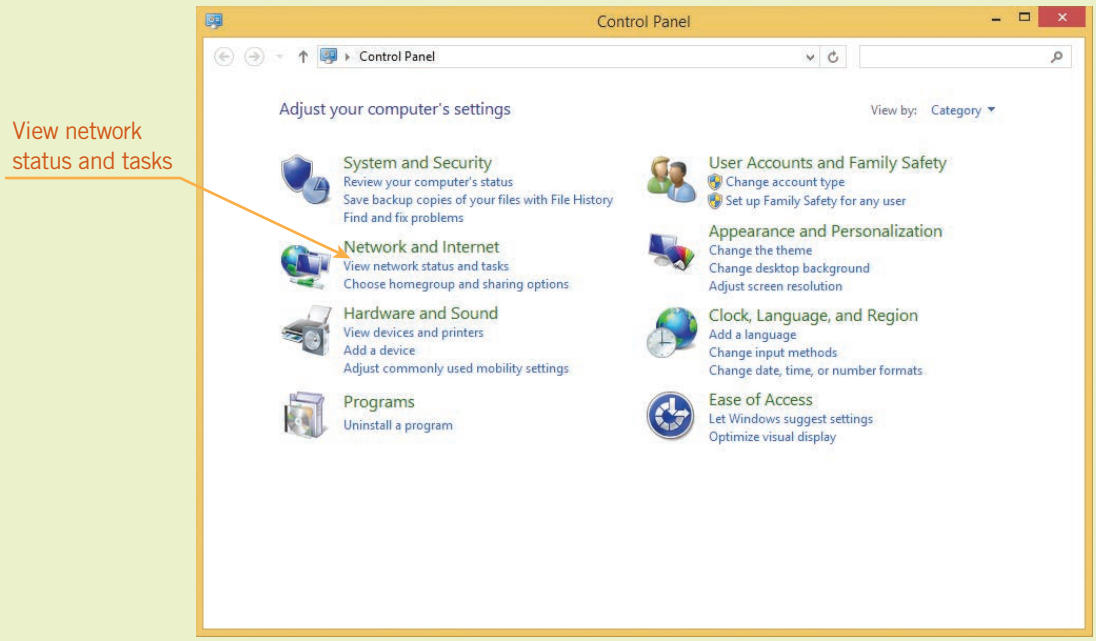
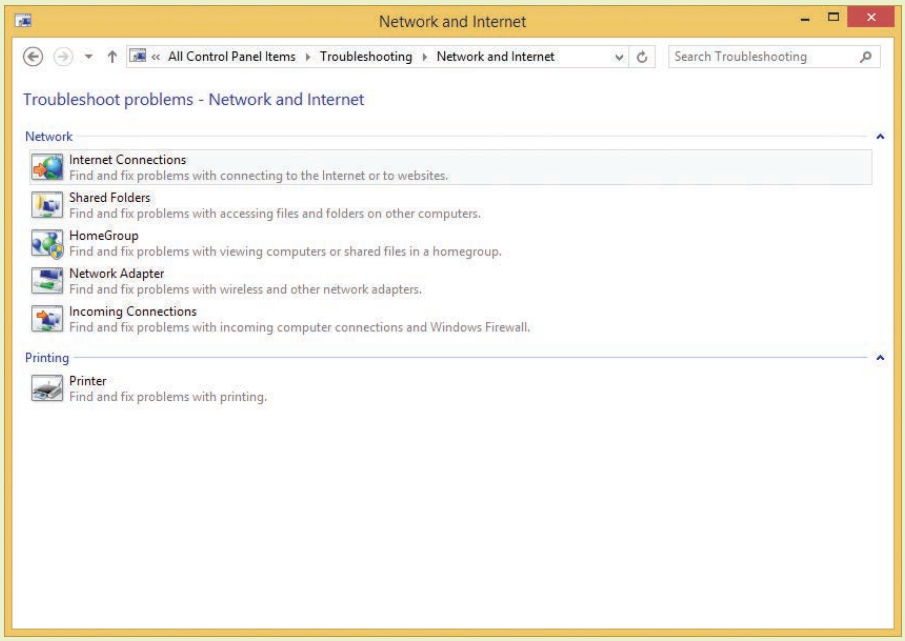


FIGURE 25–13 Network and Internet dialog box

2. Under the *Network and Internet* category, click **View network status and tasks**.

3. Under *Change your network settings*, click **Troubleshoot problems**. The Network and Internet dialog box shown in **Figure 25–14** opens.

FIGURE 25–14
Network and Internet dialog box



4. At this point you would choose one of the troubleshooting topics which would open a wizard and start the troubleshooting process. Because network settings vary, we will stop here, but now you know how to find the network troubleshooter wizards. Close the dialog box.

TECHNOLOGY CAREERS

Network Administrators

Network administrators play a vital role in any business or organization that relies on network communications for daily operations. Network administrators are responsible for managing local area networks and wide area networks, as well as other online functions for a business. In addition to maintaining the organization's hardware and software components, they also troubleshoot problems and ensure network security.

Preparation to become a network administrator includes both training and hands-on experience. Numerous technology certifications validate one's knowledge and abilities. As technology evolves, the certification requirements change, so network administrators should be prepared to continuously update their credentials.

SUMMARY



In this lesson, you learned:

- Communication networks are used to transmit voice, data, video, and Internet traffic. Communication networks are created for both public and private use.
- A computer network is a group of two or more computers linked together. As the size of a network increases, the network becomes more technical, but the networking concepts and terminology basically remain the same.
- There are several types of networks. Networks can be categorized by the scope of the network and the design of the communication method.
- Communication networks require hardware components. Multiple devices can connect to a network via wired or wireless connections.
- Software components provide remote access to networks and the tools needed to transmit data in the required formats.
- Society has benefitted in many ways because of developments in the Internet and network capabilities in the last several years.
- Network connections also present challenges, and we should evaluate the risks when we access networks.
- Although some connection problems are complex and require technical support, Windows provides troubleshooter wizards to help diagnose and repair network problems.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The largest WAN is the Internet.

T F 2. A computer network requires both hardware and software.

T F 3. Even large networks have only one server.

T F 4. An extranet is designed for the exclusive use within an organization.

T F 5. A gateway connects networks using different communications.

MULTIPLE CHOICE

Select the best response for the following statements:

1. Communication networks transmit _____ traffic.
   - A. voice
   - B. data
   - C. video
   - D. all of the above
2. A(n) _____ translates the Web address to an IP address and directs your Internet connection to the Web site.
   - A. TCP/IP
   - B. IP
   - C. DNS
   - D. WiMax
3. A(n) _____ is an address for communications on the physical network segment.
   - A. IP address
   - B. MAC
   - C. PSN
   - D. PSTN

4. A _____ service can transmit both data and voice at the same time.
   A. POTS
   B. DSL
   C. T-1 line
   D. B or C
5. A _____ network covers a large geographic area.
   A. WAN
   B. WLAN
   C. LAN
   D. NIC

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What do a router and a bridge have in common?

2. What do DSL and T-1 lines have in common?

3. What is the difference between a hub and a switch?

4. What is the difference between a modem and a cable modem?

5. What is the purpose of communications protocol?

6. What are the benefits of using packet switching techniques to send and receive data?

7. How does packet switching work?

8. How does Internet Protocol (IP) technology connect you to a Web site?

9. Describe the roles of a server and a client.

10. What are some examples of public networks, and what service do they provide?

PROJECTS

PROJECT 25–1

If you are in a networked classroom or lab, or if you have a home network, answer the following questions about the network you are using.

1. What network are you connected to?
2. Is it a public or a private network?
3. Are you connected to a LAN or a WAN?
4. Is there a designated server on the network?
5. What media type are you using for the connection?
6. If you can connect to the Internet, what is the name of the Internet Service Provider?

PROJECT 25–3

Look up the MAC address and the IP address for the computer or tablet that you are currently using.

3-2.2.2
3-2.2.3
3-2.3.3

1. Confirm that your computer is connected to the Internet.
2. Open the Start screen and then open the **Control Panel**.
3. Under Network and Internet, click **View network status and tasks**. The Network and Sharing Center dialog box opens.
4. Click your network connection. The Network Status dialog box opens.
5. Click the **Details** button in the dialog box. The Network Connection Details dialog box opens and displays information about the network status for the device, including the IP address.

PROJECT 25–2

You want to set up a private network in your home to share files on two computers: a desktop computer and a laptop computer, both with NIC wireless adapters. You also have a wireless printer that you want to share with both computers. And, you want to set up an Internet connection through a cable service.

1. Create a list of the hardware and software components that you will need to set up the network.
2. Submit the list to your instructor as requested.

TEAMWORK PROJECT

With a partner, discuss the benefits and risks you have each personally experienced with network connections.

1. Create a list of the benefits and a second list of the risks.
2. Submit the lists to your instructor as requested.

CRITICAL THINKING

CRITICAL THINKING 25–1

3-2.2.5

Why should employees who work outside the office when they travel for the company use a VPN connection?

1. Create a list of the benefits and a second list of the risks.
2. Submit the lists to your instructor as requested.

CRITICAL THINKING 25–2

3-2.2.1

If you were to choose a new Internet service provider, what factors would you consider and how would you get the information you need to make a decision?

1. Write a brief paragraph summarizing your response.
2. Submit the lists to your instructor as requested.

ONLINE DISCOVERY

The names for the LAN, WLAN, and WAN networks describe the size and the usability of the network. Over time, several more network terms have evolved that describe the scales of operation.

1. Research network types to find the definitions of the following acronyms:

   CAN

   MAN

   GAN

   SAN

   PAN

2. Write a brief description for each of the network types listed.
3. Submit the document to your instructor as requested.

3-2.2.4

JOB SKILLS

You work in an office with a wireless network, and eight people share files and a printer. Some users are unable to access the network. Before you ask a technician for help, what would you do?

1. Create a list of the steps you would take to identify and solve the problem.
2. Submit the list to your instructor as requested.

3-2.3.1
3-2.3.2

EXPLORE AND SOLVE

Find the IP address on two mobile devices, such as a smart phone or a tablet.

1. Compare the IP address on each device and write a brief summary of how you found the IP addresses.
2. Submit the summary to your instructor as requested.

3-2.3.3



Estimated Time:
1.5 hours

LESSON 26

Communication Services

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe the components for electronic communication and identify several Internet communication services.
- Explain the purposes of usernames, passwords, and credentials.
- Manage e-mail folders.
- Create and send e-mail messages.
- Receive and open e-mail messages and attachments.
- Respond and reply to e-mail messages.
- Create an e-mail signature and manage e-mail messages automatically.
- Create appropriate professional and informal messages.

DATA FILES

SA Itinerary.pdf

Travel Survey.docx

WORDS TO KNOW

archiving

channel

conversation

credentials

domain name

HTML (Hypertext Markup Language)

password

Plain Text format

protocols

Rich Text Format

signature

spam

user agent

username

Microsoft product screenshots used with permission from Microsoft Corporation.

Communication is the process of exchanging information. Traditional means of communication media include telephone, newspaper, and television. Technology developments have provided new communication media for interacting and sharing information, and the achievements have changed the way the world does business and the way we live our lives.

Describing Components of Electronic Communication

VOCABULARY

user agent

channel

protocols

Electronic communication is the technology that transmits text, numbers, voice, and video from one computer or device to another. Today's electronic communication requires a ***user agent*** which is a software application such as e-mail, text message, or an instant messaging program. The computer sending the message is the sender. The computer or device receiving the message is the receiver. The media that carries or transports the message, such as the radio signal or the coaxial cable, is called the ***channel***. ***Protocols*** are the rules that govern the transfer of data and ensure that information created by one system can be interpreted and read by another. The communication is completed when the information is transferred between user agents.

Identifying Internet Communication Services

As a worldwide electronic communications system, the Internet provides many communication services to billions of users. Wireless connections to the Internet enable users to access these communication services using mobile devices such as smartphones and tablets. The Internet provides a wide range of services including the following:

- E-mail (electronic mail) enables you to combine numerous media—text, graphics, sound, video—into a single message, and then quickly exchange information in dynamic, two-way communications.
- You use instant messaging services to send and receive messages in real time while you and someone else are both connected to the Internet.
- Instead of using a computer to communicate, text messaging (often referred to as texting) enables you to send short messages from one cell phone to another, or from the Web to a cell phone.
- Voice over IP (VoIP) is a methodology and group of technologies that transport voice, data, and video communications using Internet Protocol (IP) networks, such as the Internet.
- Online conferencing, also referred to as video conferencing, uses computer networks to transmit audio and video data so that two or more participants can conduct a conference at different sites.
- Chat rooms are Web sites that allow real-time communication so you can exchange messages with others through the computer. After you submit text typed on your computer, your submitted text displays on the other person's monitor.
- Social networking sites are Web sites that provide a way to build online communities of people who share common interests or activities.
- A blog (short for Web log) is a type of personal journal created by one person or by a group. Entries are published in reverse chronological order.
- Message boards and newsgroups provide bulletin board systems that serve as discussion sites; users can post messages asking for assistance.

ABOVE AND BEYOND

There are apps that enable you to send and receive text messages on your computer.

Using E-Mail Communication

3-3.1.1

As technology evolves and continues to provide new and enhanced methods of electronic communications, e-mail is still widely used. E-mail is similar to regular mail. You have a message, an address, and a carrier that transfers the message from one location to another. You can exchange communications within an organization network, or you can use an Internet service provider to send e-mail to any computer in the world. Unless a technical problem occurs, e-mail travels much faster than regular mail (sometimes referred to as "snail mail"). When the correspondence requires a paper or electronic trail, covers multiple points, or needs to be accessed frequently, e-mail communication will meet those needs.

Since e-mail has become a widespread means for communicating in our business and personal lives, the methods used to access e-mail have multiplied. Many Web sites and Internet service providers offer e-mail as part of a monthly fee, or even at no charge. Microsoft Outlook.com, Windows Live Mail, Google Gmail, and Yahoo Mail are examples of Web-based e-mail services. The Web site often directs you to a built-in e-mail program where you can read, send, and manage messages.

Billions of people use the Internet, and each is required to have unique identification, in the same way that each person has a unique phone number. When you set up an e-mail account, the service provider requires credentials before you can access the service features. ***Credentials*** include information to authenticate your identity when you log on to a Web site or an Internet service, such as a username and a password. Your credentials are stored on the server of the e-mail provider, which enables you to access the service.

VOCABULARY

credentials

username

password

domain name

A ***username*** is a name that identifies you when you log on to a Web site or an Internet service. The name could be your full name, a part of your name, or a fictitious name. Usually online accounts use your e-mail address as the username. Once you create a username, no one else can then use that username through that same service provider. To give your username a unique twist, consider adding an underscore, a symbol, or some numbers. However, for security, do not use numbers that refer to birthdates or addresses. An example of a good username would be: racer_3391.

A ***password*** is a word or string of characters that provides access to the service features. Strong passwords are at least eight characters in length and include a combination of text, numbers, and symbols. A combination of both upper and lowercase characters makes the password even stronger. A good example is: M3t3_Cr3ss#154! It is recommended that you not use the same password for everything because if a cyber criminal deciphers your password from one service they can then use that same password to access other accounts.

QUICK TIP

To evaluate whether or not you have a strong password, go to Microsoft.com and search for the keywords "password checker." The password checker automatically tests the strength of your password security.

Your credentials are used not only to send and receive e-mails but also for a variety of other options. For example, you can use credentials to set up a checking account, place an online order, pay bills, exchange instant messages, and so on. Other services that require a unique logon are blogs, social networking sites, and video conferencing services.

When you send postal mail to someone, you must know that person's address. The same is true for e-mail. Each user on the Internet must have a unique e-mail address. An e-mail address consists of three parts: the user name, the @ symbol, and a domain name. A ***domain name*** is an address of a computer network connection that identifies the owner of the address. For example, in the e-mail address signinname@outlook.com, signinname is the user name, and outlook.com is the domain name.

Managing E-Mail with Microsoft Outlook

Microsoft Outlook is an Office application you can use to manage e-mail. It is a versatile application that you can also use to organize contacts, appointments, and tasks. Although you will explore only the basic Outlook e-mail features in this lesson, you can also get a quick view of some of the other Outlook features.

The Step-by-Steps in this lesson assume that you already have an e-mail account set up in Outlook. As you work through the steps, the figures will show folders and e-mail messages that are comparable to what you should see on your computer. The figures are intended as a guide for you to correlate the information in the steps to the folders and e-mail messages that display on your computer.

Touchscreen Users

The instructions for Outlook generally provide directions for using a mouse to access commands and features. For example, the instructions may refer to actions such as *point*, *click*, *double-click*, or *right-click*. If you are using a touchscreen, you can use gestures such as *press*, *tap*, *slide*, *swipe*, and *drag* instead of following the directions for using the mouse.

Exploring the Outlook Features

An advantage to using Outlook as your e-mail application is that as you work with e-mail messages you can manage other types of data. For example, you can add contacts to your address book, schedule a meeting on your calendar directly from an incoming e-mail message, and add tasks to your to-do list when a message requests further action. In the next Step-by-Step you will get a quick peek at these features. You can find more information and tutorials about these features at Office.com.

Step-by-Step 26.1

IC3 3-3.1.3

QUICK TIP

If you are using Windows 7 or Vista, click the Start button, click All Programs, click Microsoft Office 2013, and then click Outlook 2013.

1. Open the Windows Start screen. If necessary, scroll through the Start screen tiles, and then click the **Outlook 2013** application tile. (If your computer is on a network, you might be prompted to enter your profile name and a password when starting Outlook. If a dialog box appears asking you to make Outlook your default program for e-mail, calendar, and contacts, click **No**.) A window similar to the one shown in **Figure 26–1** displays.

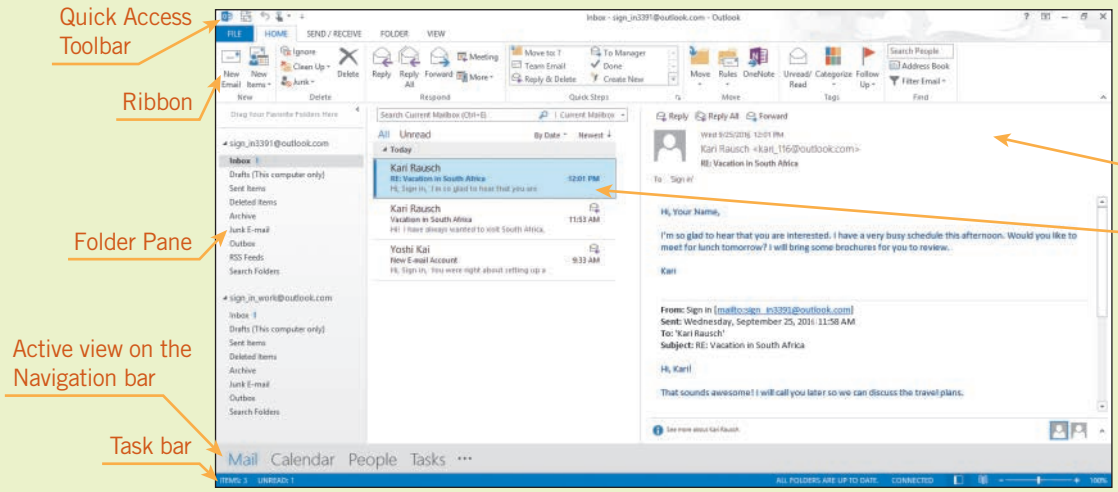


FIGURE 26–1 Outlook Mail window

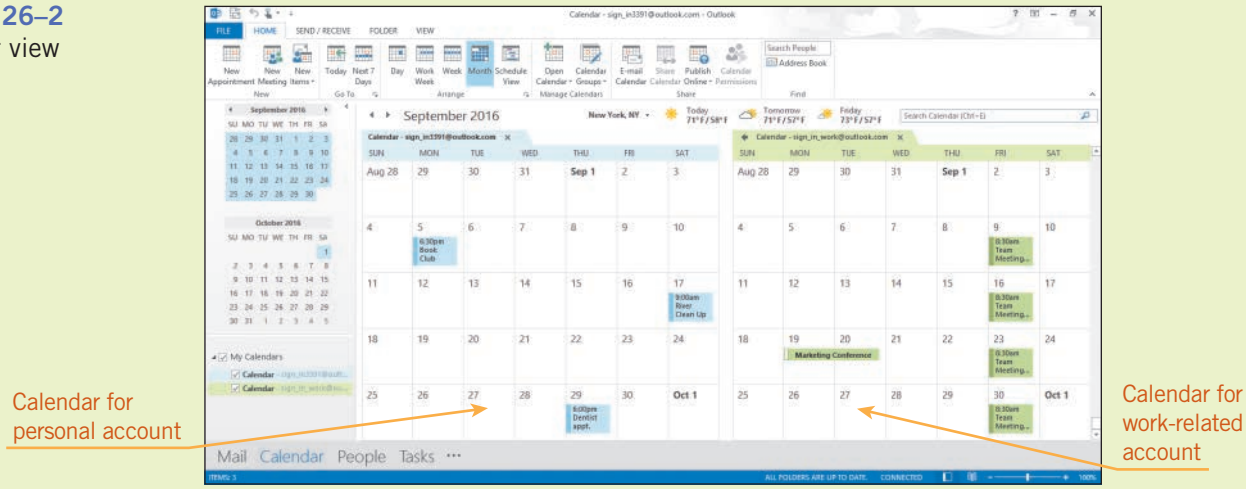
2. Even though your screen will look slightly different, you can still identify the elements in the window by comparing your screen to Figure 26–1.
   a. Note that the active view selected in the Navigation bar at the bottom of the window is Mail. This is the default view when you open Outlook. The Navigation bar also displays view options for Calendar, People, and Tasks, and more.
   b. The Folder Pane shows two e-mail accounts. The first e-mail account, *sign_in3391@outlook.com*, is an account that has been set up for personal use. The second e-mail account, *sign_in_work@outlook.com*, is a work-related account. Below each e-mail account name is a list of standard folders. The blue numbers next to the Inbox folder indicate the number of unread messages, which you will learn more about later in this lesson.
   c. The Inbox folder under the first account is selected, and the contents in the Inbox folder display in the message list in the middle pane.
   d. Note that the first message at the top of the message list is selected. The full text for the selected message displays in the Reading pane on the right.

QUICK TIP

If you do not see the Navigation Bar but instead you see icons in the Folders Pane for mail, calendar, people, etc., the Navigation bar has been compacted to allow more space in the Folders Pane. To display the Navigation Bar, click the VIEW tab. In the Layout group, click the Folder Pane button arrow and then click Options. In the Navigation Options dialog box, disable the Compact Navigation setting and then click OK.

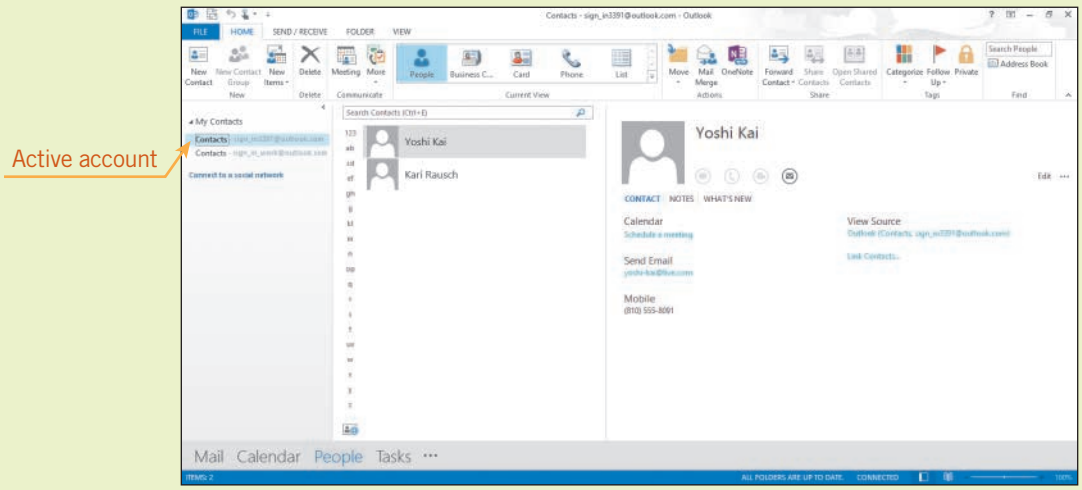
3. On the Navigation bar, point to the *Calendar* view. A quick peek view of a calendar for the current month displays. Any existing appointments display below the calendar image. Click the **Calendar** button to open a view similar to the one shown in **Figure 26–2**. Two calendars for the current month display—a calendar for each account. You use this feature to set up appointments and meetings.

FIGURE 26–2
Calendar view



4. On the Navigation bar, point to the *People* view. Your favorite contacts display and you can use this view to search for a contact. Click the **People** view. Compare your screen to **Figure 26–3**, which shows contacts for the active account. You may see more contacts on your screen. This feature stores information about personal and business contacts, which you can easily access while you are sending and receiving e-mail messages.

FIGURE 26–3
People view



5. On the Navigation bar, point to the *Tasks* view. A summary of your To-Do List displays. Click the **Tasks** view. As shown in **Figure 26–4**, a To-Do List displays in the left pane. You can create new tasks and search for existing tasks in the right pane. Note that the To-Do List is for both the personal and the work-related accounts. The tasks are listed by due date, and they can be flagged for priority.

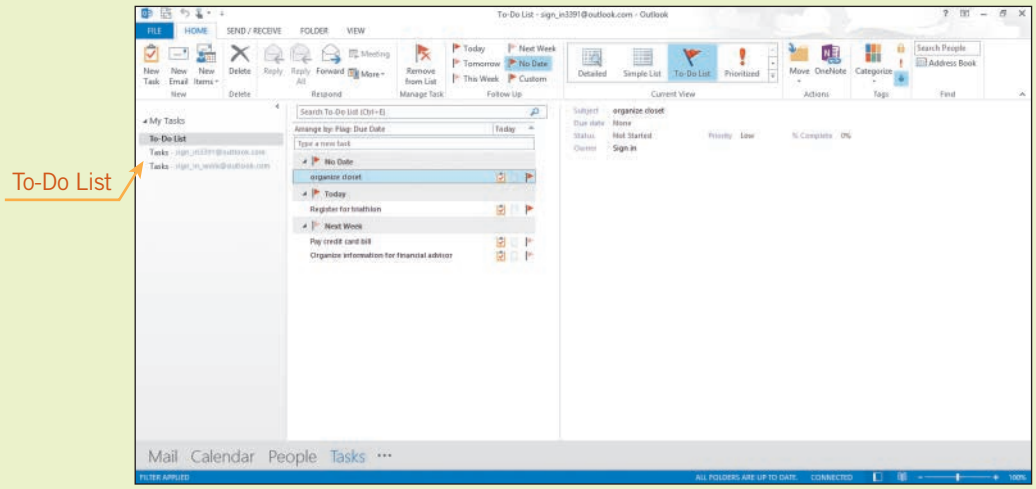


FIGURE 26–4
Tasks view

6. On the Navigation bar, click the **Mail** view. Leave Outlook open for the next Step-by-Step.

Managing E-Mail Account Folders

Outlook allows you to manage multiple e-mail accounts by organizing the messages in standard folders such as Inbox, Drafts, Sent Items, and Outbox. You can customize most Outlook folders to display information in a number of ways. The folders can be divided into favorites and general mail folders, or you can create your own personal folders for various topics, special projects, and individuals.

Mail management is handled primarily through the Inbox. When you open Outlook, it sends a request to your mail server to check if you have any messages waiting. Outlook receives incoming messages and displays them in the Inbox folder. The list of the messages in the Inbox can be arranged by date with the newest on top or the oldest on top.

Archiving is the process of backing up your e-mail messages. Using the default settings, Outlook runs the AutoArchive feature every 14 days. Depending on the settings you choose, after a designated period of time Outlook will automatically delete old messages or move them to an archive data file. The archive data file will be saved with a .pst extension, and you can choose the drive and folder where the archive data file is saved.

VOCABULARY
archiving

ABOVE AND BEYOND

Outlook can synchronize data with other devices such as another computer, a cell phone, or other mobile devices. When messages are sent or received on one of the devices, the e-mail information is automatically updated on the synchronized devices. There are several tools and apps that enable you to synchronize information between your computer and other devices.

Step-by-Step 26.2

3-3.1.3

1. If necessary, start **Outlook** and click the **Mail** view in the Navigation bar.
2. If necessary, in the Folder Pane, select the **Inbox** folder for your e-mail account.
3. Click the **Collapse** button to the left of your e-mail account name. The subfolders for the account name are hidden as shown in **Figure 26–5**. If other e-mail accounts display in the Folder pane, collapse the subfolders in each of those accounts.

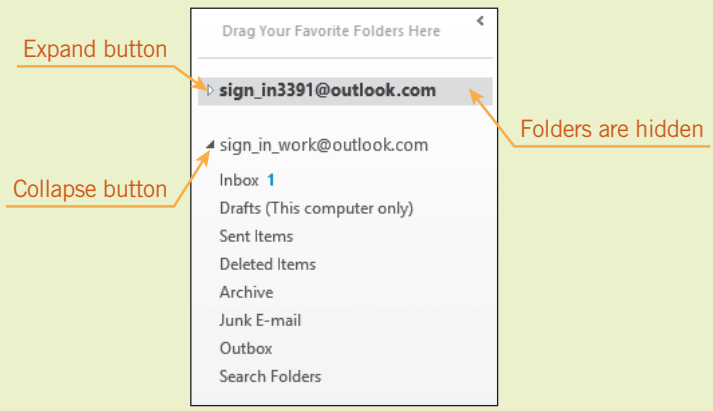


FIGURE 26–5
Collapsed folders

4. Click the **Expand** button to the left of your e-mail account name to show the subfolders. Do not expand the folders in any other e-mail accounts.
5. Explore some of the subfolders under your e-mail account name. Folder names may differ from those shown in Figure 26–5. For example, instead of Deleted items, the subfolder may be named Trash.
   a. Click the **Drafts (This computer only)** folder. This folder is used to hold messages that you have drafted but you are not ready to send them. The reference to this computer only means that the draft is saved on your computer but not on the server for your e-mail account.
   b. Click the **Sent Item** folder. This folder shows a list of all the messages that you have sent from your e-mail account.
   c. Click the **Deleted Items** folder. This folder contains messages that you have deleted.
   d. Click the **Archive** folder. Standard subfolders for all of Outlook features display, including an Inbox folder. If you have been using Outlook for several months, you may see folders that contain items that were automatically archived.
   e. Click the **Outbox** folder. This folder contains messages that you have sent but the data has not yet been transferred. For example, sent messages are stored in the Outbox when you do not have an Internet connection.

ABOVE AND BEYOND

To view and/or change the AutoArchive settings, select a folder in the Folder Pane. Click the FOLDER tab on the Ribbon. In the Properties group, click the AutoArchive Settings button. The current settings for the active folder will display.

6. In the Folder pane, select your e-mail account name. Click the **FOLDER** tab. In the New group, click the **New Folder** button .
7. A Create New Folder dialog box, similar to the one shown in **Figure 26–6**, opens. The insertion point is positioned in the *Name* text box. Type **South Africa**. Under *Select where to place the folder*, your e-mail account name is already selected.

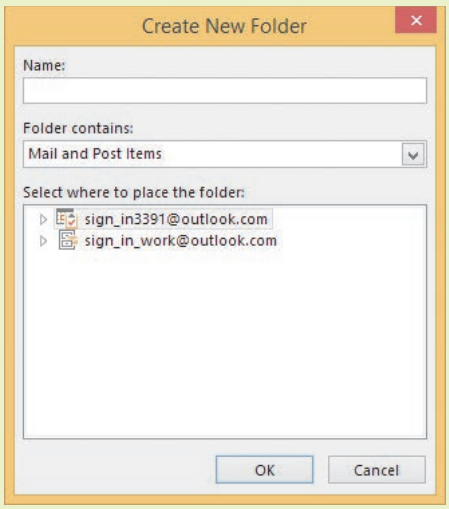


FIGURE 26–6
Create New Folder dialog box

8. Click **OK**. As shown in **Figure 26–7**, the new folder now displays in the list under your e-mail account name.

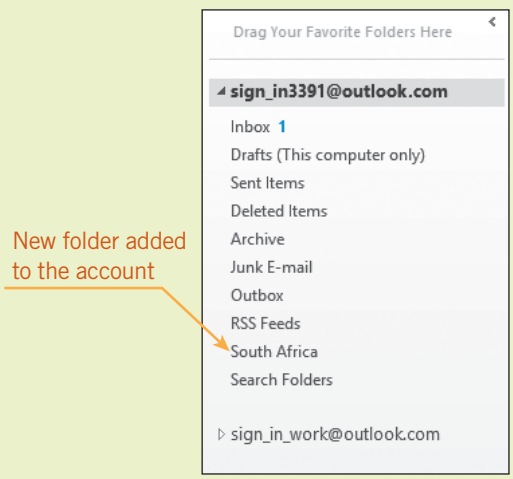


FIGURE 26–7
New folder added to account

9. Click the **HOME** tab. Leave the Outlook open for the next Step-by-Step.

Creating and Saving an E-Mail Message

Creating an e-mail involves entering the e-mail addresses of the people to whom you are sending the message, adding a subject line, and typing the message.

You can send an e-mail message to multiple recipients, and the message goes to all the e-mail addresses at the same time. If you are sending an e-mail to more than one person, each e-mail address should be separated by a semicolon. You can type the e-mail address for the recipients, or you can access the addresses in your contacts (sometimes referred to as an address book).

You can send a courtesy copy (Cc) copy of an e-mail to another person. You should only copy people who are directly involved. The recipient of the Cc is visible to all the recipients of the message. It is proper etiquette to use Cc so all the recipients know who received a copy. However, when you add addresses to the To and Cc text boxes, you are disclosing the e-mail addresses of all those recipients. If you don't want to disclose a recipient's address, you can send a blind copy (Bcc) to that recipient. The recipient of the Bcc is not visible to the primary and Cc recipients, so they are not aware that someone else received the message. You can Cc and Bcc multiple recipients.

It is good e-mail etiquette to include a subject for your message. The subject should be brief, yet descriptive enough to tell the recipient what the message is about. Many people scan the subject lines of their messages before opening them, so your subject lines should be meaningful and accurate.

The body of the message should be clear, concise, and free from spelling errors. You can even format the body of the message to look like a traditional document. Outlook and other e-mail programs provide at least two formatting options: HTML and Plain Text. ***HTML (Hypertext Markup Language)*** is the default format in Outlook, and it supports text formatting options such as multiple fonts, bold text, colored headings, graphics, and links to Web sites. Messages with the ***Plain Text format*** contain only text. There are no colors, hyperlinks, or graphics. Outlook also provides ***Rich Text Format***, which is a Microsoft format supported only by Microsoft e-mail applications. Rich Text Format is similar to HTML and enables you to apply text formats including fonts, paragraph alignment, bulleted lists, and hyperlinks.

ABOVE AND BEYOND

The Cc in the e-mail window is the abbreviation for *carbon copy*, which originated with the old-fashioned typewriter. To send someone a copy of a letter or to create a file copy, a typist used a sheet of carbon paper between each sheet of paper.

ABOVE AND BEYOND

To simplify the task of sending an e-mail message to multiple recipients, you can create a Send/Receive group. You can add multiple members to the group, and then when you enter the e-mail address, you enter the Send/Receive group name. Outlook then sends the message to each member in the group.

VOCABULARY

HTML (Hypertext Markup Language)

Plain Text format

Rich Text Format

Step-by-Step 26.3

IC3 3-3.1.2

In this Step-by-Step, you will send e-mails to your own e-mail address so that you do not need to interact with other users to complete the steps.

1. If necessary, click the **Mail** view in the Navigation bar, select the **Inbox** folder for your e-mail account, and select the **HOME** tab. In the New group, click the **New Email** button  .
2. An *Untitled - Message (HTML)* window opens. Compare your screen to **Figure 26–8**. The MESSAGE tab displays on the Ribbon. The header pane with the To, Cc, and Subject text boxes displays below the Ribbon.

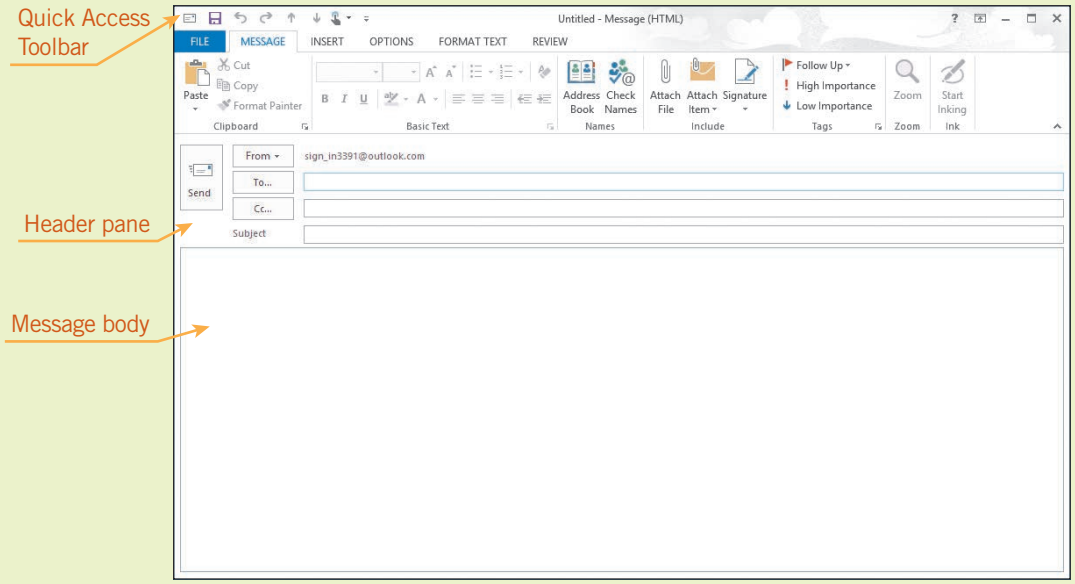


FIGURE 26–8
Untitled – Message window

3. The *To* text box is active, indicated by a blue border. Type your e-mail address and press **Enter**. A semicolon is automatically inserted at the end of the address.
4. Begin typing your e-mail address again. After you enter a few characters, in a ScreenTip Outlook suggests one or more e-mail address that begin with the same characters. When you see your full e-mail address, click the **ScreenTip** to enter the complete address in the text box.
5. Right-click your e-mail address in the *To* text box. In the shortcut menu, click **Add to Outlook Contacts**. A contact form, similar to the one shown in **Figure 26–9**, opens.

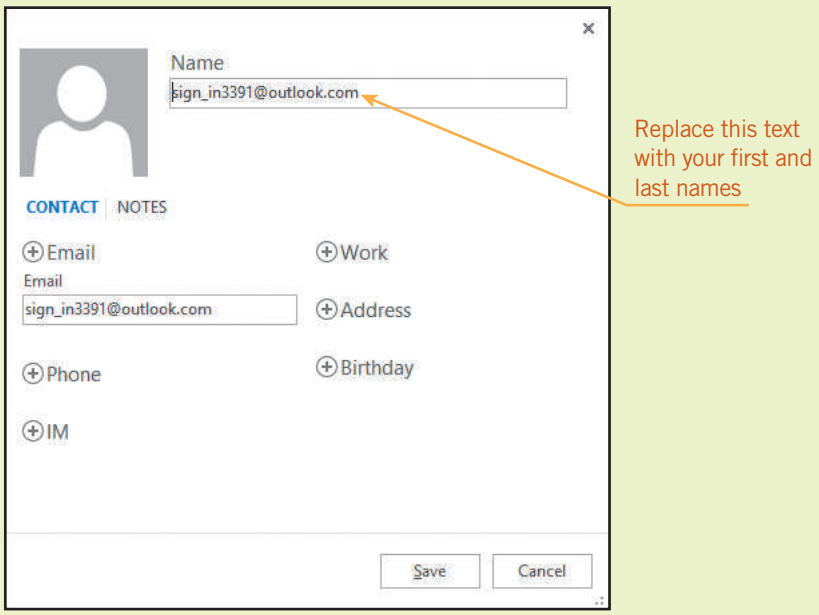
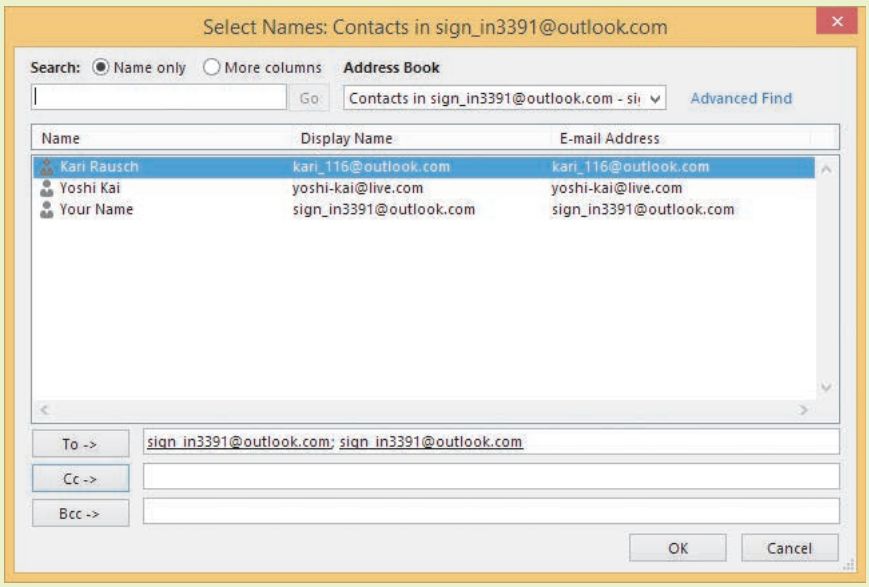


FIGURE 26–9
Contact form

6. Note that your e-mail address displays in both the *Name* text box and the *Email* text box. Select all the text in the *Name* box and then type your first and last names. Then click **Save**. When prompted to provide more information for the account, click **OK**. Then click **Save** again. A form displays showing your name and e-mail address, which are now saved in your Outlook address book. Click the **Close** button to close the form.
7. In the header pane, click the **Cc** button. A Select Names: Contacts... dialog box, similar to the one shown in **Figure 26–10** opens. In the *Search* text box, type your name and press **Enter**. Outlook will navigate to and select your contact information. Your e-mail address is automatically inserted in the *Cc* text box.

FIGURE 26–10
Select Names: Contacts... dialog box



8. Your e-mail address is still selected above. Click the **Bcc** button. Your e-mail address is inserted in the *Bcc* text box. Click **OK** to close the dialog box. In the message window, your e-mail address appears twice in the *To* text box, and once in the *Cc* text box, and the *Bcc* text box.
9. In the message header, click in the **Subject** text box. Type **South Africa Trip**.
10. Click in the message area. The title of the window changes to *South Africa Trip*. Type the following message:

    Hi, All!

    I am looking forward to the South Africa trip next month. I'm attaching a proposed itinerary for our destinations. Let me know if you like this plan.

    Your Name

11. Select all the text in the message area. Change the font style to **Arial** and change the font size to **12 pt**. (*Hint:* You can use the Mini Toolbar.) Select the text **South Africa** and change the font color to **red**. Deselect the text.

12. When your message looks similar to **Figure 26–11**, click the **Save** button on the Quick Access Toolbar. In the upper-right corner of the message window, click the **Close** button.

QUICK TIP

If the recipient's e-mail program does not support HTML, when the message is opened, the body of the message is displayed as plain text.

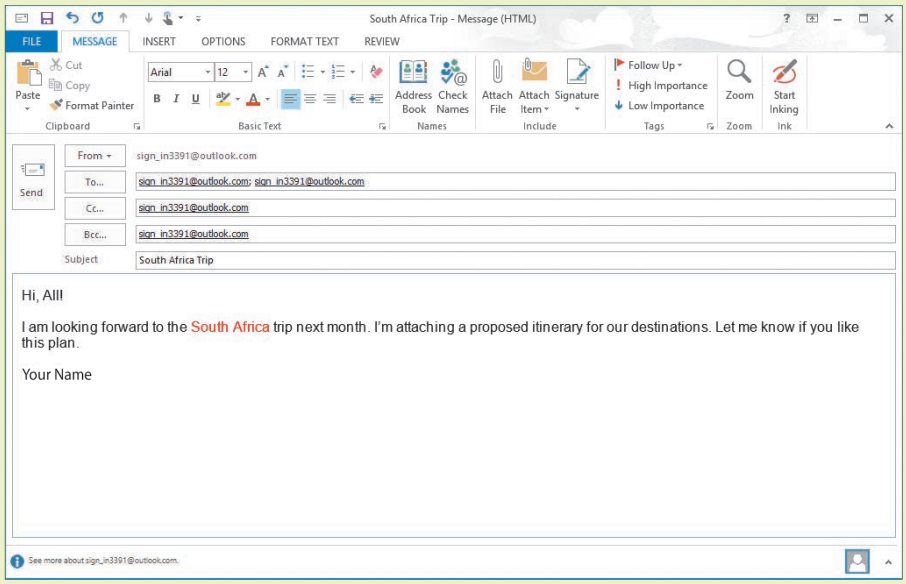


FIGURE 26–11
Drafted message

13. Compare your Folder Pane to the one shown in **Figure 26–12**. Note that the *Drafts* folder shows a number indicating that there is a message in the folder.

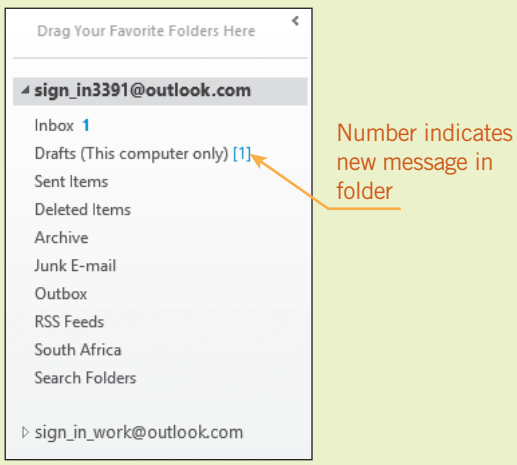


FIGURE 26–12
Item appears in Drafts folder

14. Leave Outlook open for the next Step-by-Step.

Attaching a File and Sending a Message

In addition to sending a message, you can include attachments such as pictures or documents. More than one file can be attached to the same message, and the files do not need to be of the same type. Any attachments should be noted in the body of the message. When recipients receive the message, they can open or save the attached file. In addition to the e-mail options discussed previously, other alternatives are available. The ability to send and receive e-mail attachments, and other supplemental information, is of great benefit and is often a timesaver, though it does introduce a security risk.

You can add a tag to the message header to alert the recipients about the priority of the message. For example, you can add a tag to indicate that the recipients should follow up, that the message is high priority, or that the message is low priority.

Regardless of whether the message is formal or informal, incorrect spelling and grammar will give you a poor reflection. Although using the default settings, Outlook checks spelling as you type, you may have missed some of your errors. It is good practice to use the Spelling & Grammar command before you send the message. Similar to the spell check feature in Word, you can ignore a flagged issue, apply suggested edit, or edit the content yourself.

Sometimes e-mail messages "bounce back" and are undeliverable. The e-mail address is typed incorrectly, a server in the process might not recognize the address, or the server is busy and the process is not completed within the specified amount of time. The message may also be undeliverable because the recipient has blocked messages from the sender, the recipient's mailbox is full, or the recipient's security settings reject attachments, or attachments with executable programs (.exe extensions).

QUICK TIP

Instead of attaching a file, if the e-mail is created in HTML format, you can create a hyperlink to the file in the e-mail message. With this format, the recipient can click the link rather than opening an attachment. For example, you can type a URL in the message body, or you can select a word or phrase and then create a hyperlink. The recipient of the message must also use a program that can display hyperlinks.

Step-by-Step 26.4

1. If necessary, click the **Mail** view in the Navigation bar, select the **Inbox** folder for your e-mail account, and select the **HOME** tab.
2. In the Folder Pane, click the **Drafts** folder. The *South Africa Trip* message is selected in the message list and the message content displays in the Reading pane. The COMPOSE TOOLS MESSAGE tab displays on the Ribbon. Compare your screen to **Figure 26–13**.

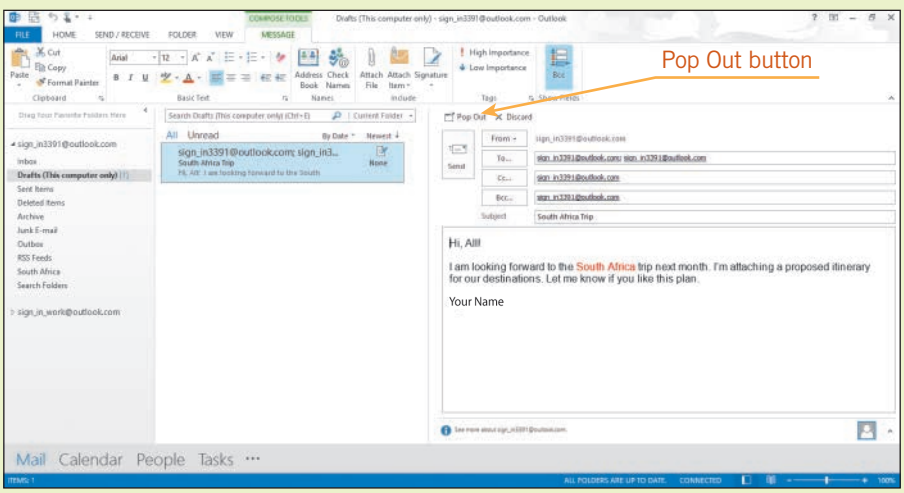


FIGURE 26–13
Draft Message displayed in Reading pane

QUICK TIP

You can enable settings so that Outlook will automatically check spelling and grammar before you send an e-mail. To locate the Spelling and AutoCorrect settings, click the FILE tab, click Options, and then click Mail.

3. In the upper-left corner of the Reading pane, click the **Pop Out** button. The message opens in its own window and the Ribbon adapts.
4. Click the **INSERT** tab. In the Include group, click the **Attach File** button.
5. The Insert File dialog box, similar to the one shown in **Figure 26–14**, opens. Navigate to the drive and folder where your data files are stored and select the **SA Itinerary.pdf** filename.

QUICK TIP

You can also double-click the message in the message list to open it in its own window.

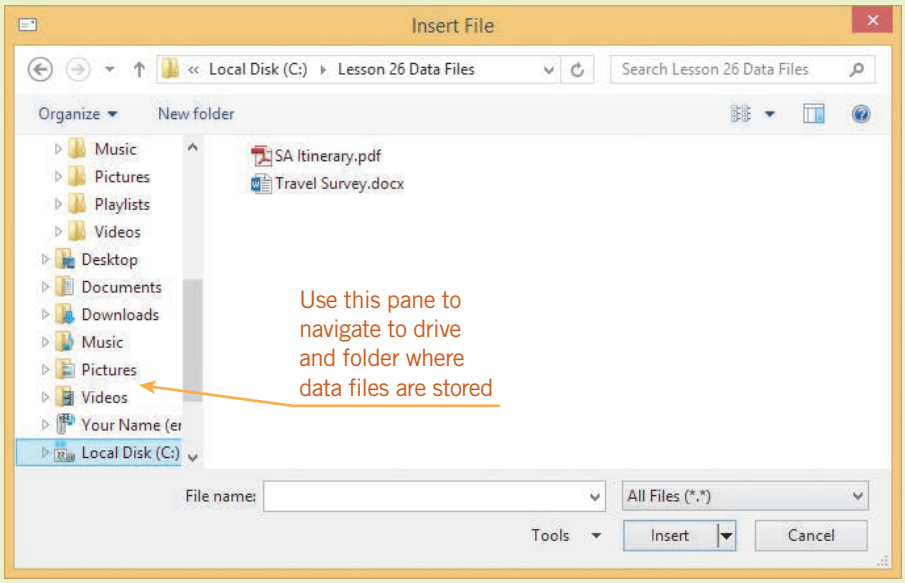


FIGURE 26–14
Insert File dialog box

QUICK TIP

If you have trouble sending or receiving messages with attachments, the problem may be the size of the attachment. Some e-mail programs limit the number of and the size of attached files. Furthermore, e-mail programs and anti-virus software block messages with attachments that appear to contain harmful software or unrecognizable content.

6. Click the **Insert** button. The file is attached, and a new text box is added to the message header, as shown in **Figure 26–15**.

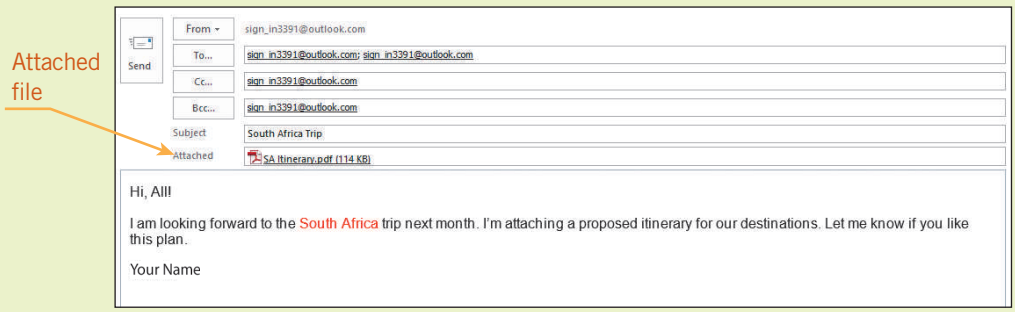


FIGURE 26–15
Attachment identified in the header pane

7. Click the **MESSAGE** tab. In the Tags group, click the **High Importance** button to enable the tag. This indicates to the recipients that the message is high priority.

8. Click the **REVIEW** tab. In the Proofing group, click the **Spelling & Grammar** button. Make any necessary corrections. The REVIEW tab only displays when the message is displayed in its own window.
9. In the header pane, click the **Send** button. If you are currently connected to the Internet, when you click the Send button, the message should be sent within a few seconds. If your computer or device is not connected to the Internet, the e-mail message will remain in the Outbox folder until you have an online connection. After the message is sent to the server, Outlook moves the message from the Outbox folder to the Sent Items folder.
10. In the Folder Pane, click the **Sent Items** folder. The copy of the message is deleted from the Drafts folder and a copy of the message now appears in the folder.
11. Leave Outlook open for the next Step-by-Step.

QUICK TIP

If the Outbox folder contains messages, notice the icon—it looks like a small addressed and stamped envelope—that indicates the message is ready to send.

Receiving and Opening E-Mail Messages

When you receive a message, Outlook automatically saves the message in the Inbox. Using default settings, Outlook is scheduled for an automatic send/receive every 30 minutes. However, you can manually check for new messages in your Inbox at any time.

The message list displays information from the message headers for any new messages. The information tells you who sent the message, the subject of the message, and the date and time your server received it. When the message is selected in the message list, the entire message displays in the Reading pane and you can use the scroll bars to navigate through the message. If the message contains a significant amount of content, you might find it easier to read by opening the message in its own window.

You can organize the message list by date, and you can filter the list so that only the unread messages display. To quickly locate a message, you can search for keywords in messages that display in the message list. You can manually mark a message as read or unread. Icons in the message headers in the message list offer clues about each message. For example, a red exclamation point icon means the sender considers it an urgent or high-priority message; a paper clip icon indicates that the message has an attached file. You can also add a flag icon as a reminder to follow up on the message.

You will most likely open most of the messages in your Inbox, but you do not need to open or save unwanted messages and spam. ***Spam*** is unsolicited e-mail. In many instances, spam is used to advertise products and services. Most Internet service providers provide tools that filter spam messages to help you avoid these annoying and phony messages. Outlook can automatically direct suspicious messages to the Junk E-mail folder. To avoid receiving these unwanted messages, be careful about displaying your e-mail address publicly and do not reply to unwanted e-mail messages from questionable sources. You will learn more about controlling spam in Lesson 31.

ABOVE AND BEYOND

To change the settings for sending and receiving messages, click the FILE tab, click Options, and then click Advanced. Scroll down to the Send and receive category and click the Send/Receive button.

VOCABULARY

spam

Step-by-Step 26.5

1. If necessary, click the **Mail** view in the Navigation bar then select the **Inbox** folder for your e-mail account. Click the **SEND / RECEIVE** tab. Use the mouse pointer to show the ScreenTips for the commands in the Send & Receive group. The Send/Receive All Folders command sends and receives all items in all the folders. The Update Folder command sends and receives messages for the current folder, and the Send All command sends all unsent mail.

IC3 3-3.1.3

2. Click the **Send/Receive All Folders** button. Compare your screen to **Figure 26–16**. You should see at least one new message in your Inbox. You may also see the Cc and Bcc copies that you sent yourself. However, you may only receive one message because the redundant messages might be filtered. If you see multiple copies of the message, select the message at the top of the list.

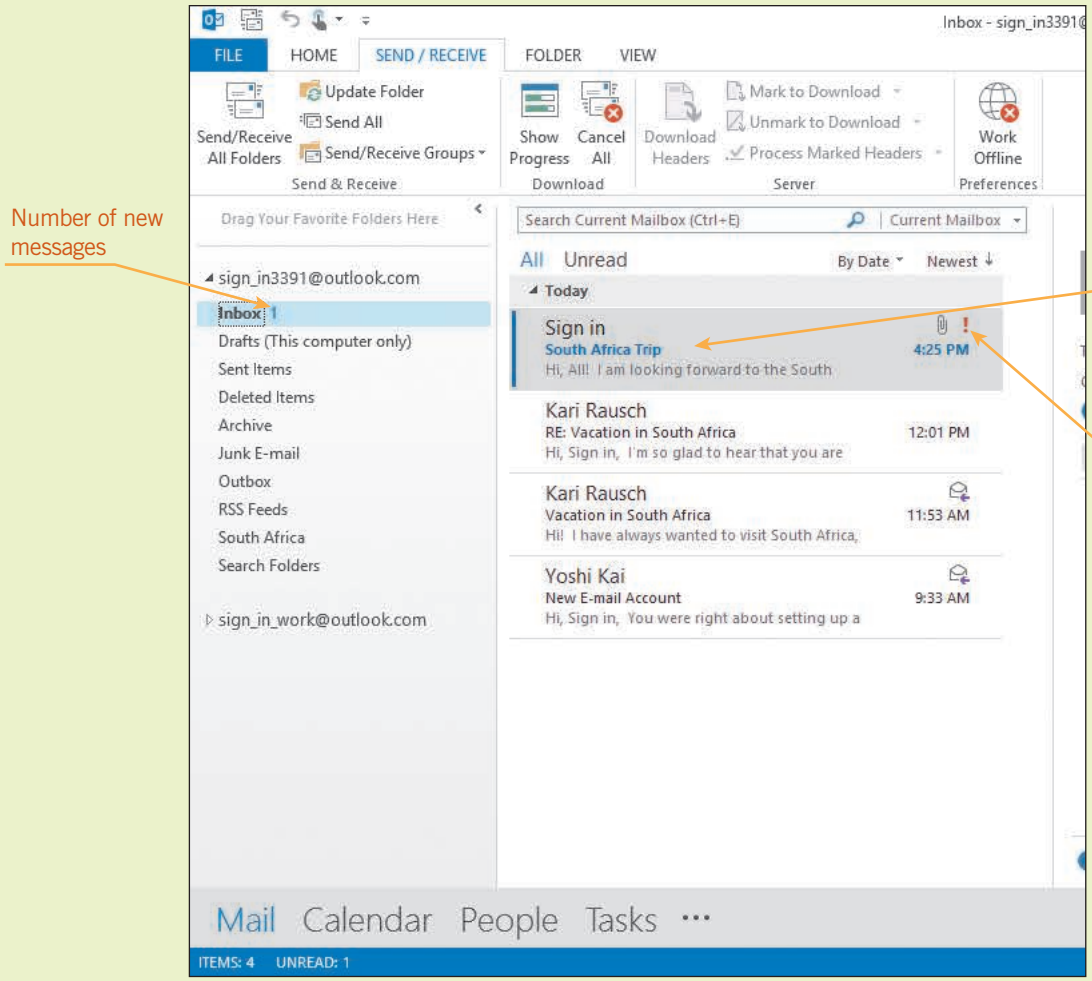


FIGURE 26–16
A new message in the Inbox

a. In the Folder Pane, a blue number appears to the right of the Inbox folder indicating the number of new messages.

b. In the message list, information about the sender, the subject, and the time the message was received is displayed. A blue vertical border displays on the left of each unread message, and the text in the Subject box and the time stamp for when the e-mail was sent are both formatted with a blue font.

c. In Figure 26–16, the heading *Today* displays above the message list. When organized by Date, additional headings such as Yesterday, and Last Week are added as your message list grows. Messages received on the current date show only a time. Older messages will show a previous day in the week, such as Tuesday, or a previous date, such as September 18.

d. In the message list, a paper clip icon and a red exclamation point appear in the upper-right corner of the message you sent to yourself. The paper clip icon indicates that the message includes an attachment. The red exclamation point indicates that the sender has tagged this as a high priority message.

3. The default setting shows all messages in the message list. To show only your unread messages, click **Unread** on the toolbar above the message list. Only the unread messages appear in the message list. Click **All** on the toolbar to show all the messages in the Inbox folder.

4. Note that the message in the message list is still selected, but the unread formats are removed. Once the message is read, even previewed in the Reading pane, the blue border and fonts are removed. To mark the message as unread, right-click the **message** in the message list and then in the shortcut menu, click **Mark as Unread**.

5. By default, the message list is organized by date, with the newest e-mail at the top of the list. Click the **By Date** button arrow on the toolbar above the message list. The menu shown in **Figure 26–17** displays and provides several options for organizing the messages. Your menu options may vary from those shown in the figure. Close the menu without making any changes.

QUICK TIP

You can also mark a message read or unread by clicking the Unread/Read button in the Tags group on the HOME tab.

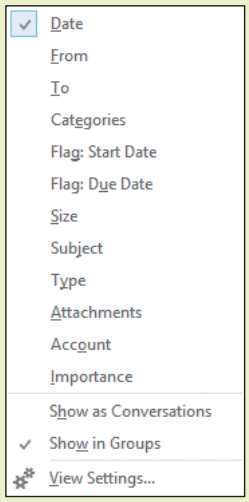


FIGURE 26–17
Options for organizing the message list

ABOVE AND BEYOND

To search for a message, navigate to the area just above the toolbar for the message list, click the Search Current Mailbox text box and type keywords for any part of the message. Then click the Current Mailbox arrow to the right of the search box and select an option for the folders you want to search.

6. The new message in the message list that was sent from your e-mail address to you should still be selected. The contents display in the Reading pane as shown in **Figure 26–18**.

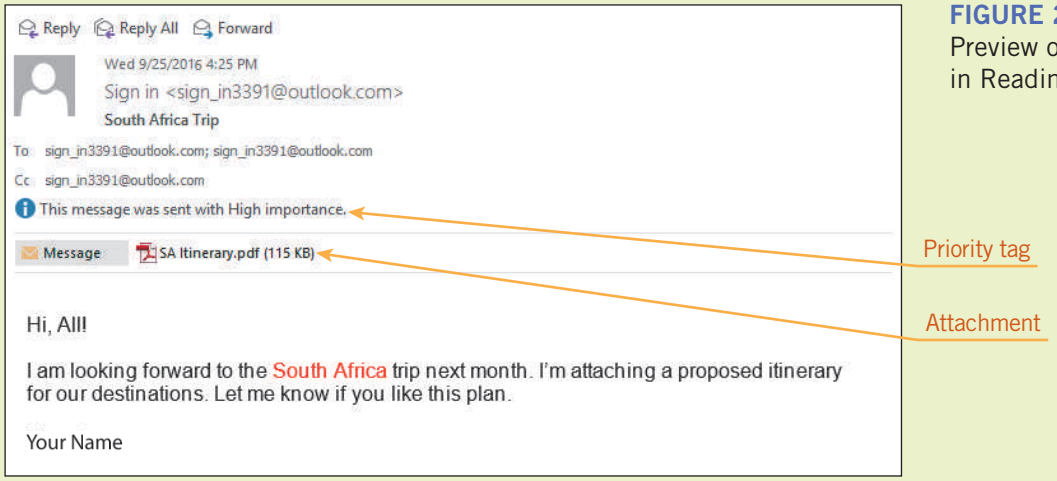


FIGURE 26–18
Preview of message in Reading pane

   a. You can see the Cc recipient's address, but you cannot see that there was a Bcc recipient.
   b. A note in the header begins with an exclamation point and reads "This message was sent with High importance."
   c. Below that note is a text box showing an attached file.

7. In the message list, point to the right side of the *selected message*. A new Follow Up flag button and a Delete button appear as shown in **Figure 26–19**. Click the **Follow Up** flag button. The message now shows a red flag which serves as a reminder that you need to follow up with this message.

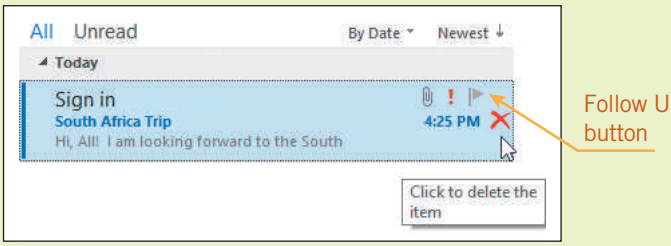


FIGURE 26–19
Follow Up button and Delete button

8. In the Delete group on the HOME tab, click the **Junk** button and then in the menu click **Block Sender**. When prompted to add the message to the Blocked Sender List and to move the e-mail to the Junk E-mail folder, click **OK**. The message is moved to the *Junk E-mail* folder.
9. In the Folder Pane, click the **Junk E-mail** folder. If necessary, select the message you sent to yourself. In the Delete group, click the **Junk** button and then click **Never Block Sender**. Click **OK**. The message remains in the *Junk E-Mail* folder and is still selected in the message list.
10. On the HOME tab, in the Move group, click the **Move** button. In the folder list, click your personal folder **South Africa**. The message is moved to your personal folder. A *blue* number *1* displays next to your personal folder indicating that one of the messages in the folder has not been read.
11. In the Folder Pane, click the **South Africa** folder. The unread message displays in the message list.
12. Leave Outlook open for the next Step-by-Step.

QUICK TIP

You can also access the Junk commands by right-clicking a selected message and then in the shortcut menu point to Junk.

QUICK TIP

You can access the Move command by right-clicking the selected message. You can also drag and drop messages to move them from one folder to another.

Opening E-Mail Attachments

When you receive an attachment to an e-mail message, you can preview the file contents in the Reading pane or you can open the attachment file in an application such as Word or Adobe Reader. You can also print an attached document or save the attachment file to your computer or device. When using default settings, Outlook prompts you to enable editing when you open a file attached to an e-mail.

Step-by-Step 26.6





3-3.1.2

1. If necessary, click the **Mail** view in the Navigation bar and in the Folder Pane select the **South Africa** folder in the Folder Pane. The message you sent to yourself should already be selected.
2. In the Reading pane, at the bottom of the message header, click the file-name **SA Itineary.pdf**. The Ribbon adapts and shows the ATTACHMENTS tab. The Actions group provides several commands for accessing the attachment file.
3. The Reading pane now displays a prompt cautioning that you should only preview files from a trustworthy source. Click the **Preview file** button. A preview of the document displays in the Reading pane.
4. In the Actions group, click the **Open** button  . The PDF document opens in an Adobe Reader window.
5. Click the **Close** button (or press Alt+F4) to close the Adobe Reader window.
6. In the Message group, click the **Show Message** button  . The Reading pane now shows the body of the message.
7. Leave Outlook open for the next Step-by-Step.

Responding and Replying to a Message

The easiest way to reply to an e-mail message is to use the Reply command, type your reply message, and then send the message. With this type of reply, the original message is included along with your reply message. When you reply to an e-mail message, the recipient normally sees RE: preceding the text in the subject line to indicate that it is a reply message.

If more than one person is listed on the From, To, or Cc lines of the e-mail message, you can use the Reply All command instead of Reply. Suppose, for example, you received an e-mail from a friend and the friend used the Cc text box to send a copy of the message to several other people. To reply to only the sender, click the Reply button. To reply to the friend and send a copy of the message to the others listed in the Cc box, use the Reply All button. Using the Reply or Reply All option is appropriate when all the recipients can benefit from and should see your response.

VOCABULARY
conversation

A ***conversation***, sometimes referred to as the message thread, is the complete set of e-mail messages from the original message through all the responses. All messages in a conversation have the same subject. There are often several replies and multiple people involved in a conversation.

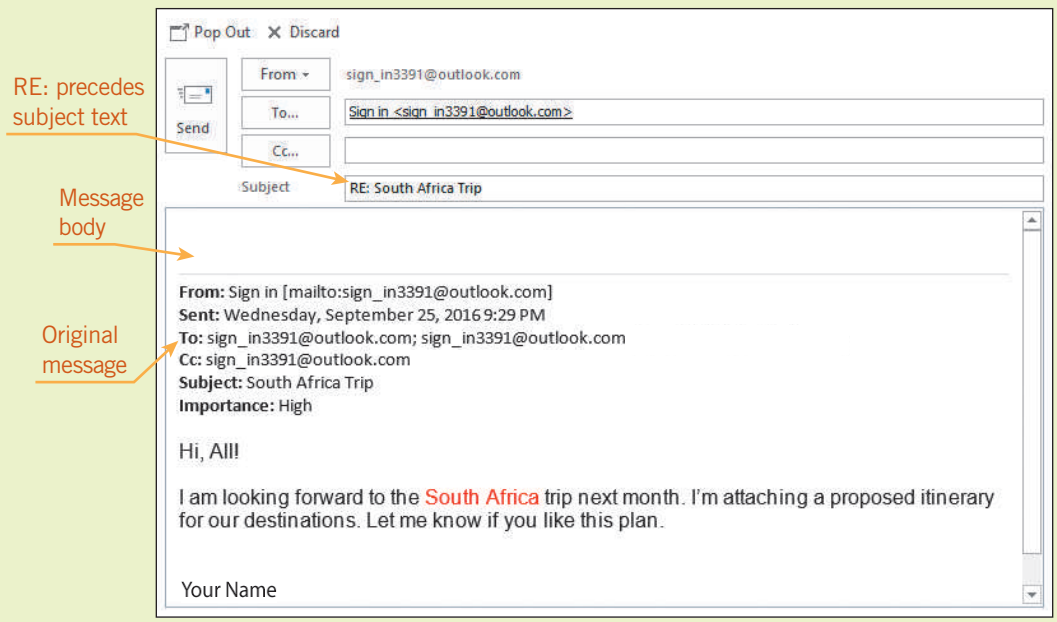
The Forward option is similar to replying to a message except that when you forward a message, you send it to people other than those who sent the original message. Forwarding a message helps cut down on the time you spend creating messages from scratch. It is also a quick way to share information with a number of people. When you forward a message, a recipient normally sees FW: preceding the text in the subject line to identify it as a message that is being forwarded.

Step-by-Step 26.7

IC3
3-1.2
3-1.3

1. If necessary, click the **Mail** view in the Navigation bar and select the **South Africa** folder in the Folder Pane.
2. On the toolbar in the Reading pane, click the **Reply** button. The Reading pane displays a new message, similar to that shown in **Figure 26–20**. In the Subject text box, the letters *RE*: are inserted before the original text. The insertion point is blinking in the message body, and the original message displays below the body of the message.

FIGURE 26–20
Reply message in the Reading pane



3. Type the following:

   This itinerary looks awesome! I will now book our flights.

   Your Name

4. Note that the text in the reply message displays in a blue font. The original message below displays in a black font.

5. In the Reading pane, click the **Send** button. The reply message is sent, and the original message displays in the Reading pane.
6. On the toolbar in the Reading pane, click the **Forward** button  . The text in the Subject text box, *FW*: appears in front of the original text. The PDF file is still attached to the message.
7. The insertion point is flashing in the *To* box. Enter your e-mail address.
8. Click in the body of the message and type the following:

   Hi, Carter!

   Attached is an itinerary for our South Africa trip. Can you please help me find flight reservations?

   Thanks,

   Your Name
9. The new text is formatted with a blue font, the same as a reply message. Make any necessary changes.
10. In the Reading pane, click the **Send** button. The message and the attachment are sent to the recipient.
11. In the message list, click the **Follow Up flag** for the selected message. The flag icon changes to a check mark, indicating that you followed-up on the message.
12. In the Folder pane, click the **Inbox** folder for your e-mail account. You should have two new messages, the reply message and the forwarded message which you can easily identify because the letters RE: and FW: have been added to the subject lines.
13. Leave Outlook open for the next Step-by-Step.

QUICK TIP

To remove an attachment before forwarding the message, in the message line right-click the attachment, and then click Remove Attachment on the shortcut menu.

QUICK TIP

You can also delete messages using the Delete button in the Delete group on the HOME tab. To delete multiple messages, select all the messages to be deleted and then click the Delete button.

Creating a Signature

VOCABULARY
signature

A ***signature*** consists of text or graphics that you create so Outlook can automatically add it to the end of any outgoing messages. You can create unique signatures for different e-mail accounts. For instance, you might want a signature for friends and family and another signature for business purposes.

Step-by-Step 26.8

IC3 3-3.1.3

1. If necessary, click the **Mail** view in the Navigation bar, select the Inbox folder for your e-mail account, and select the **HOME** tab.
2. Click the **FILE** tab to open Backstage view. In the left pane, click **Options**. The Outlook Options dialog box opens. In the left pane, click **Mail** to display the options shown in **Figure 26–21**.

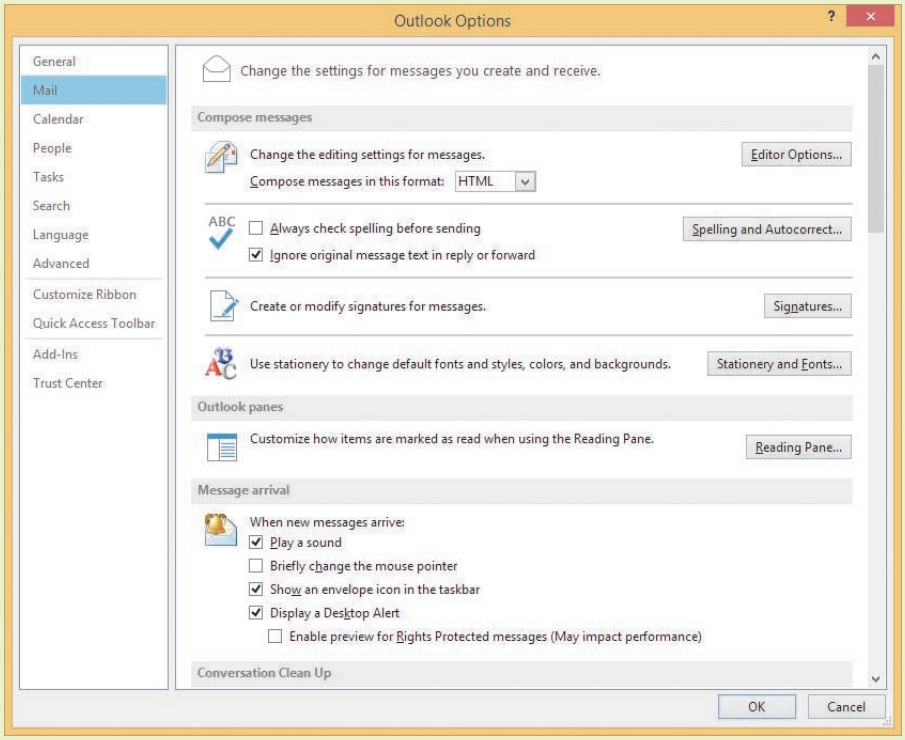


FIGURE 26–21
Mail options in the Outlook Options dialog box

3. Under the *Compose messages* category, click the **Signatures** button. The Signatures and Stationery dialog box shown in **Figure 26–22** opens.

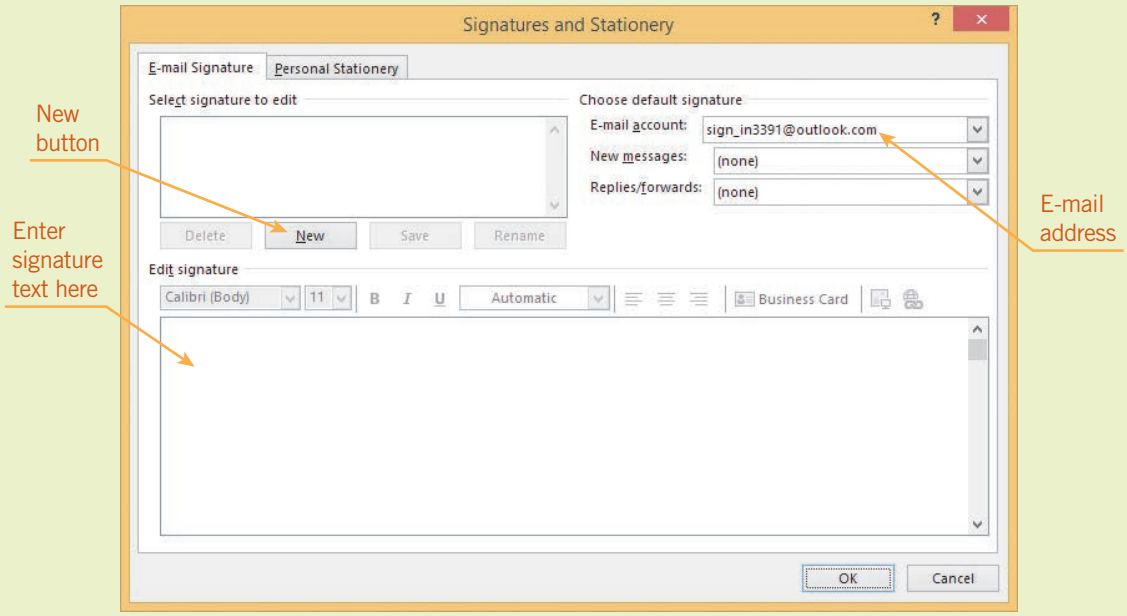


FIGURE 26–22
Signatures and Stationery dialog box

4. Under *Select signature to edit*, click the **New** button. In the New Signature dialog box, type your first and last names and then click **OK**. Your name is added to the box on the left, and your e-mail account information should display at the right as shown in Figure 26–22.
5. Click in the text box under *Edit signature* and type the following:

   Your Name

   1500 Club Trail Drive

   Westerville, OH 43081

   614-555-6787
6. Select all the text. Click the **down** arrow to the right of the *Automatic* box and then select a **dark color** of your choice. Note that you can also change the font style and size as well as change the alignment of the text.
7. Click **OK** to close the Signatures and Stationery dialog box, and then click **OK** to close the Outlook Options dialog box.
8. In the New group on the HOME tab, click the **New Email** button. A new message window opens, and the signature you created appears in the message body. Click the **Close** button to close the message window.
9. Click the **FILE** tab, click **Options**, and then click **Mail**. Then click the **Signatures** button. In the Signatures and Stationery dialog box, under *Select signature to edit*, make sure the signature you just created is selected.

10. Under the text box below *Select signature to edit*, click the **Delete** button. When prompted to remove the signature, click **Yes**. Then close both dialog boxes.
11. Leave Outlook open for the next Step-by-Step.

Setting Rules for Auto-Responding to Messages

You can create an Outlook rule to automatically reply to some or all received e-mail messages. You can personalize a message to let senders know that you are not able to respond. The message should also provide information about when you expect to return to your normal routine for responding to e-mails. In a professional environment, you should also provide additional information so the sender can contact someone else for assistance with urgent issues.

To set up an auto-response for messages, you must first create a template for the message content, and then you must set some rules. In order for the automatic reply rule to work, Outlook must be running and configured to check for new e-mails periodically.

Step-by-Step 26.9

IC3 3-3.1.3

1. If necessary, click the **Mail** view in the Navigation bar, select the **Inbox** folder for your e-mail account, and select the **HOME** tab.
2. In the New group, click the **New Email** button. In the *Subject* text box, type **Disconnected for a few days**.
3. In the message body, type the following:

   I am traveling and have limited access to e-mail.

   I will return on September 25, and I will respond to messages then. For urgent issues, please call me at 937-555-8976.

   Thanks,

   Your Name
4. Click the **FILE** tab and then click **Save As**. Complete the following steps in the order provided so the file is not saved in the default folder.
   a. In the *File name* box, type **Disconnected**.
   b. Click the **Save as type** list arrow, and then click **Outlook Template**.
   c. Using the pane on the left, navigate to the drive and folder where you save your solution files.
   d. Click **Save**.
5. Close the message window. When prompted to save the message, click **No**.

6. In the Move group, click the **Rules** button. In the menu click **Manage Rules & Alerts**. The Rules and Alerts dialog box shown in **Figure 26–23** opens. Click **New Rule**.

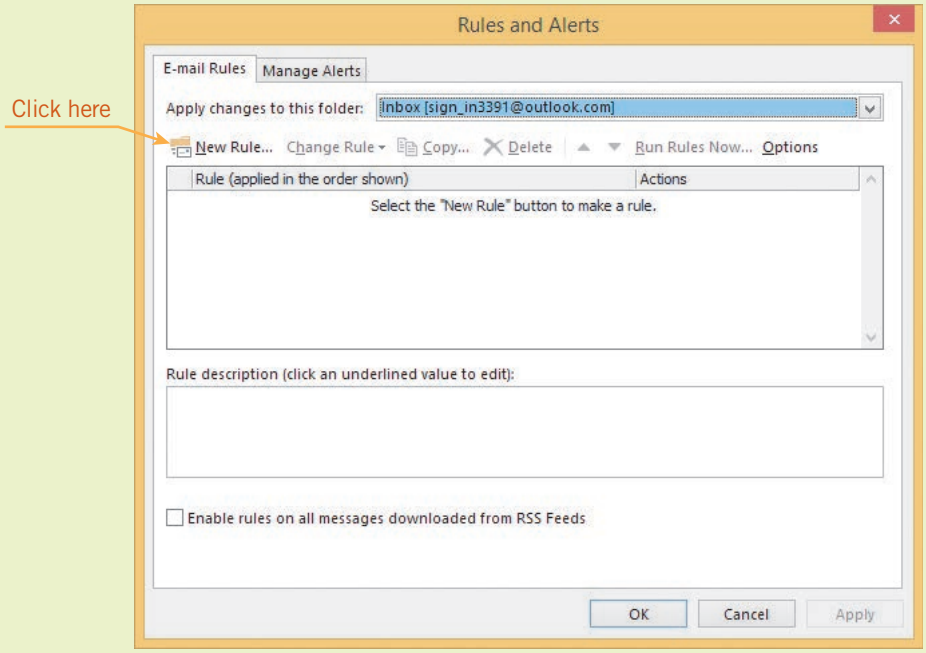


FIGURE 26–23
Rules and Alerts dialog box

7. The Rules Wizard dialog box, shown in **Figure 26–24** opens. Under *Start from a blank rule*, click **Apply rule on messages I receive**, and then click **Next**.

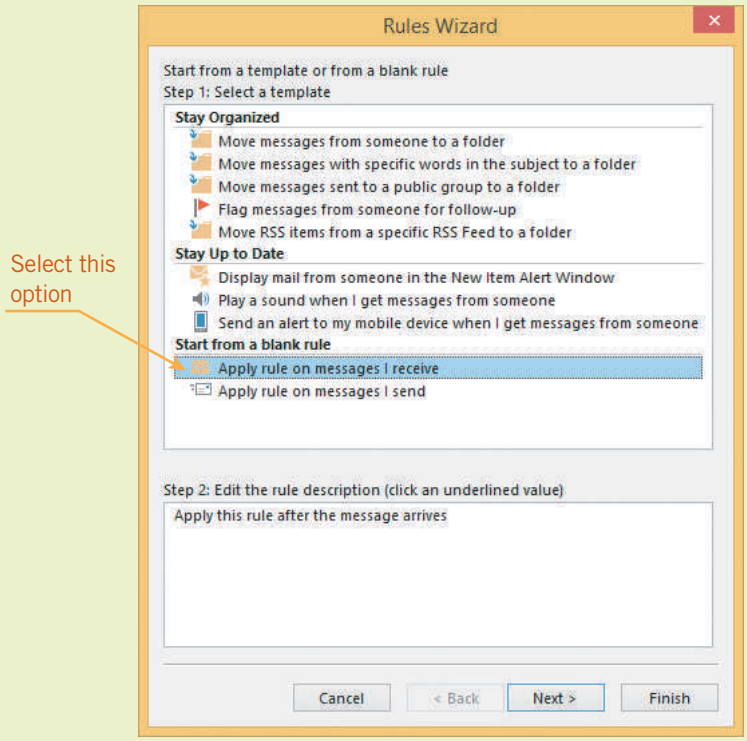
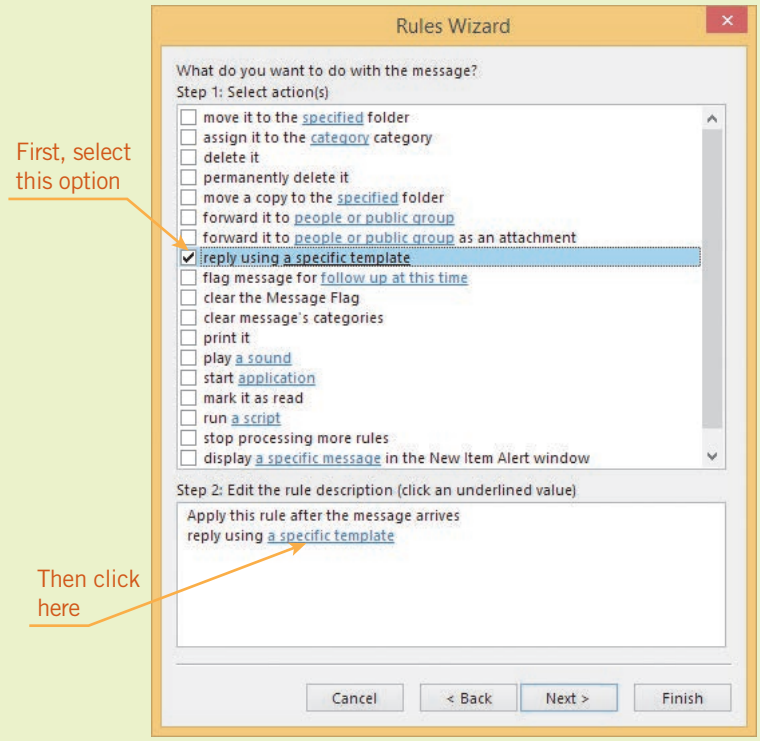


FIGURE 26–24
Rules Wizard dialog box

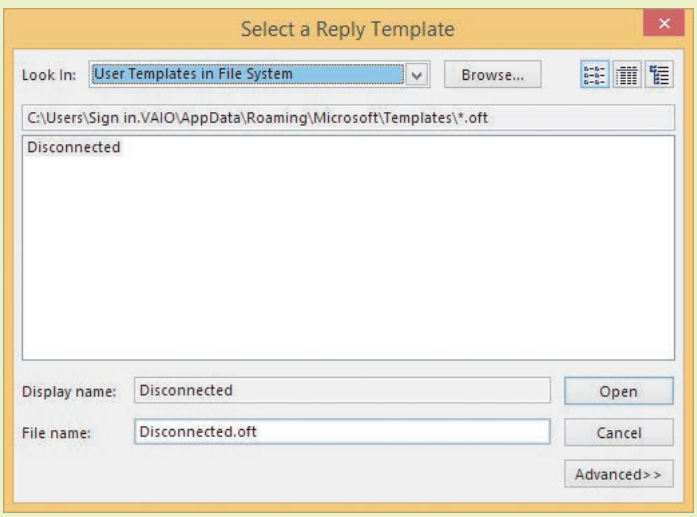
8. You do not need to select and enable any conditions, so click **Next**. When prompted to apply the rule to every e-mail you receive, click **Yes**.
9. The next screen in the wizard opens. Under *Step 1: Select action(s)* check **reply using a specific template**. Compare your screen to **Figure 26–25**.

FIGURE 26–25
More options in a Rules Wizard dialog box



10. Under *Step 2: Edit the rule description (click an underlined value)*, click on the hyperlink **a specific template**. The Select a Reply Template dialog box, as shown in **Figure 26–26** opens. If necessary, click the **Look In** box arrow and select **User Templates in File System**.

FIGURE 26–26
Select a Reply Template dialog box



11. Click the **Browse** button and navigate to the folder where your solution files are stored. After you click the folder name click **OK**, the Select a Reply Template dialog box opens. Click the **Disconnected** filename and then click **Open**. The template filename now displays under *Step 2* at the bottom of the Rules Wizard dialog box.
12. Click **Next**. You do not need to check any exceptions for the auto-reply rule. Click **Next** again. Another dialog box similar to the one shown in **Figure 26–27** opens so you can create a name for the rule. Under *Step 1: Specify a name for this rule*, a proposed rule title is already selected. To replace the title, type **Auto Reply** as shown in Figure 26–27, and then click **Finish**. Outlook will automatically respond to all incoming messages and send the message you created in Step 3.

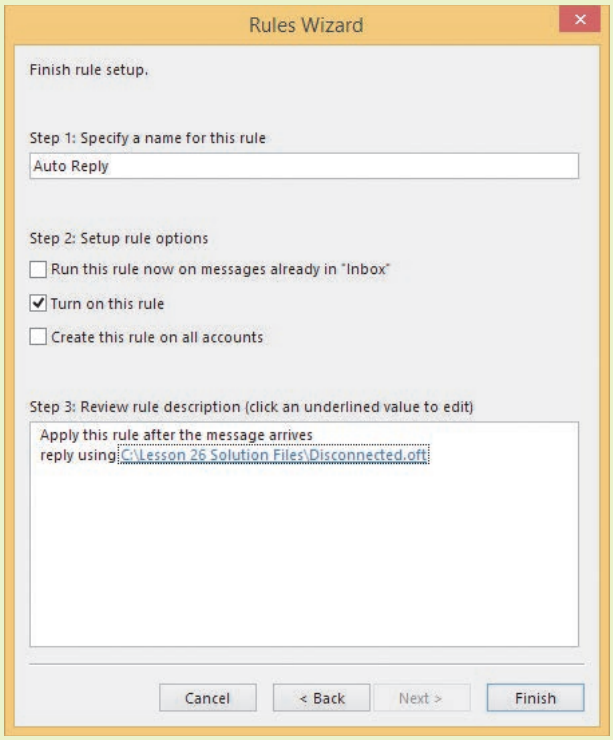


FIGURE 26–27
Specify a rule name in the Rules Wizard

13. The Auto Reply rule should still be selected in the Rules and Alerts dialog box. On the toolbar above the list of rules, click the **Delete** button. When prompted to delete the rule, click **Yes**. Then close the Rules and Alerts dialog box.
14. Leave Outlook open for the next Step-by-Step.

Setting Rules for Redirecting Messages

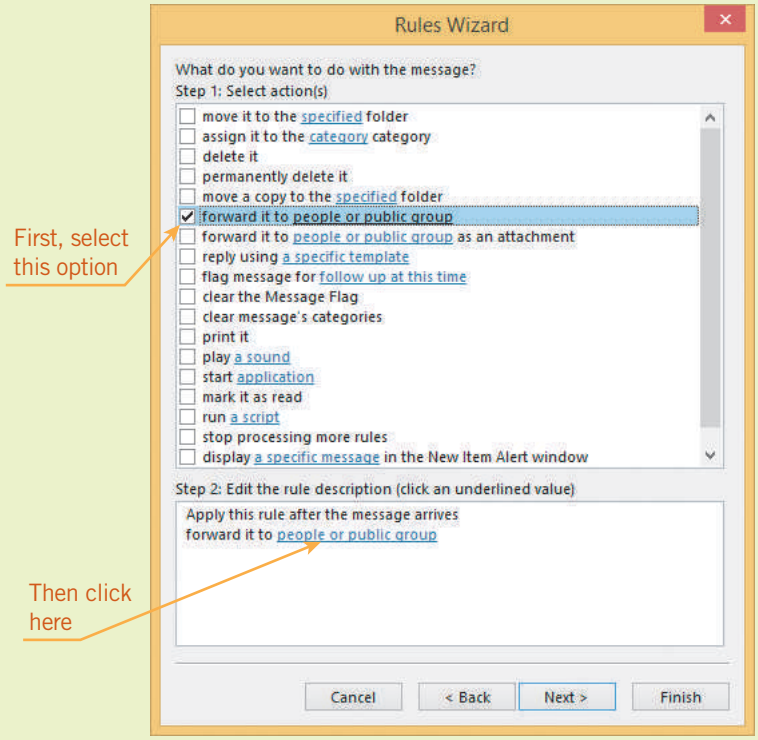
You can also set rules that redirect incoming messages so they are automatically forwarded to another e-mail address.

Step-by-Step 26.10

3-3.1.3

1. If necessary, click the **Mail** view in the Navigation bar, select the **Inbox** folder for your e-mail account, and select the **HOME** tab.
2. In the Move group, click the **Rules** button and then click **Manage Rules & Alerts**. In the Rules and Alerts dialog box, click **New Rule**.
3. Under *Start from a blank rule*, click **Apply rule on messages I receive**, and then click **Next**.
4. You do not need to select and enable any conditions, so click **Next**. When prompted to apply the rule to every e-mail you receive, click **Yes**.
5. Under *Step 1: Select action(s)* enable the option **forward it to people or public group**, as shown in **Figure 26–28**. At the bottom of the dialog box, under *Step 2: Edit the rule description (click an underlined value)*, click the hyperlink **people or public group**. The Rule Address dialog box opens.

FIGURE 26–28
More options in a Rules Wizard dialog box



6. In the *To* box at the bottom of the dialog box, enter your e-mail address and then click **OK**.
7. Click **Next**. You do not need to check any exceptions for the forward rule, so click **Next**.

8. Under *Step 1: Specify a name for this rule*, a rule title is already selected. To replace the title, type **Forward messages**, and then click **Finish**. The new rule is added to the list in the Rules and Alerts dialog box, and the rule is enabled.
9. The rule is selected. On the toolbar above the rule list, click the **Delete Rule** button. When prompted to delete the rule, click **Yes**. Close the Rules and Alerts dialog box.

Cleaning Up Your Folders

Over time, your mail folders may store a lot of messages. Outlook provides a Clean Up Folder feature which automatically removes redundant messages from conversations, which are messages that share the same subject. Conversations are beyond the scope of this lesson. Another way to clean up your folders is to manually delete the messages. Outlook prompts you before you delete messages permanently.

Step-by-Step 26.11

1. If necessary, click the **Mail** view in the Navigation bar, select the **Inbox** folder for your e-mail account, and select the **HOME** tab.
2. In the Folder Pane, click the **South Africa** folder. In the message list, point to the right side of the *message* and when it appears, click the **Delete** button. The message is moved to the Deleted Items folder.
3. In the Folder Pane, click the **Deleted Items** folder. The deleted message is selected in the message list. In the Delete group on the HOME tab, click the **Delete** button  . When prompted to delete the message permanently, click **Yes**.
4. In the Folder Pane, right-click the **South Africa** folder. In the shortcut menu, click **Delete Folder**. When prompted to move the folder to the Deleted Items folder, click **Yes**.
5. In the Folder Pane, click the Expand button to the left of the Deleted Items folder. Right-click the **South Africa** folder. In the shortcut menu, click **Delete Folder**. When prompted to delete the folder and its contents, click **Yes**.
6. Remove any unwanted files in your Inbox.

3-3.1.2

Creating Appropriate Messages

With the advent of online communication formats, the boundary between professional and informal messages has blurred. Not only has computer technology provided the tools to make composing messages easier, we can now compose messages faster. The fast-paced media used for electronic communication demands a writing style that is clear and concise without sacrificing speed. This often results in informal messages that include abbreviations and conversational language. As a result, sometimes recipients interpret the message differently than the sender intended and the information is communicated incorrectly. When writing professional communications, the language should be more formal and the information should be stated in complete sentences that clearly deliver the intended message.

E-mails provide an electronic trail, similar to that of a traditional paper trail. A paper trail is a written record, history, or collection of evidence created by a person or organization in the course of activities. E-mails create electronic trails that document discussions, contact information, even access to attached files. But keep in mind, e-mail messages are not private. An electronic trail can be restored and reviewed, and you may be judged on what you say and how you say it. So as you write an e-mail message and before you send the message, make sure the content is accurate and appropriate.

At one time or another, everyone has sent an e-mail that they wanted to take back. For example, maybe you sent the message to the wrong person. Or, if you receive an e-mail message that makes you angry, your immediate response may be to send a quick reply. This action could accelerate the conflict instead of resolving it. To avoid sending a message you later may regret, consider the following options:

- Before you create the message, discuss the issue with someone else. Let them share their opinions and suggestions for how you should respond.
- When you begin to create your message, do not include the e-mail address in the To line. This will prevent an accidental sending of the message.
- Before you click Send, make sure you are sending the message to the right people. Proofread everything and confirm that you have no misspelled words or grammatical errors.
- Save your message overnight as a draft and then reevaluate your response the next day.



ETHICS IN TECHNOLOGY

E-Mail/E-Aches

Although e-mail is a popular service that enables us with quick and convenient communication, it may not always save us time. Many users find an overflow of messages in their Inboxes. Similar to telemarketers using your phone number, online marketers and other groups can locate your e-mail address and use it to send you many unwanted e-mail messages. But it's not just marketing messages. Co-workers and personal friends may forward messages to you that are of no value to you. Receivers are often guilty of not thoroughly reading an e-mail message before they reply, or they may use the Reply All option even when all the recipients do not need to receive the response. Pay close attention to whom you are sending your messages and replies.

SUMMARY



In this lesson, you learned:

- Electronic communication is the technology that enables users to transmit text, numbers, voice, and video from one computer or device to another.
- The Internet provides many communication services, such as e-mail, instant messaging, and text messaging to billions of users around the world.
- Even as technology evolves and provides new and enhanced methods of electronic communications, e-mail is still widely used.
- Outlook provides several features that enable you to access calendars, contacts, and tasks as you work with e-mail messages.
- Creating an e-mail involves entering the e-mail addresses of the recipients, adding a subject line, and typing the message.
- E-mail messages are organized in folders. You can use the standard folders provided in the default settings, or you can create your own personal folders to store messages.
- In response to an incoming message, you can reply to the message, forward the message to a new recipient, delete the message, or save the message.
- You can automatically add a signature at the end of any outgoing messages.
- Special e-mail features enable you to automatically respond and forward incoming messages to another address.
- When creating e-mail messages, whether for professional or informal communications, it is important that the message is clear and accurate.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. To automatically respond to e-mails, you must create a rule.

T F 2. A signature can be positioned in the center or on the right side of the message body.

T F 3. Each user on the Internet must have a unique e-mail address.

T F 4. When you select a message in the message list, only a portion of the text for the message displays in the Reading pane on the right.

T F 5. When you receive an attachment to an e-mail message, you must open the attached file in a new window.

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. In contemporary electronic communications, software applications installed on the local PC are also called _____.
2. An e-mail address consists of three parts: the user name, the @ symbol, and the user's _____.
3. _____ is the process of backing up your e-mail messages.
4. A(n) _____ icon in the message header indicates that the message has an attached file.
5. _____ is unsolicited e-mail, essentially electronic junk mail.
6. A(n) _____ is a type of personal journal created by one person or by a group.
7. _____ is the default format in Outlook that supports text formatting options such as multiple fonts, bold text, colored headings, graphics, and links to Web sites.
8. The _____ is the media that carries or transports the message, such as the radio signal or the coaxial cable.
9. _____ include information to authenticate your identify when you log on to a Web site or an Internet service, such as a username and a password.
10. _____ is a methodology and group of technologies that transport voice, data, and video communications using Internet Protocol (IP) networks, such as the Internet.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. How is e-mail similar to regular mail?

2. What is the purpose of including a subject in the message header?

3. What is the difference between a Cc copy and a Bcc copy?

4. Why is it recommended that you not use the same password for everything?

5. Why is it important to keep an electronic paper trail?

PROJECTS

PROJECT 26–1

You want to get feedback from your friends and colleagues about travel habits and preferred destinations, so you will create an e-mail message and ask the recipients to complete the form and return it to you within 10 days.

1. Create a new personal folder **Projects**.
2. Create a new custom signature. Format the text as desired.
3. Create and send an e-mail message to at least one friend or classmate. If instructed to do so, Cc the message to your instructor.
4. Enter an appropriate subject in the message header.
5. Attach the **Travel Survey.docx** file from the drive and folder where your data files are stored.
6. In the body of the message, ask the receiver to open the attached document, complete the form, and then save the document and return it to you. Don't forget to mention the deadline for returning the survey form.
7. Check the spelling and grammar.
8. Tag the message as high priority and then send the message.

IC³
3-3.1.2
3-3.1.3

PROJECT 26–2

3-3.1.2
3-3.1.3

1. Receive and preview each of the new messages you received regarding the travel survey.
2. Preview each of the messages in the Reading pane.
3. Open the attachments to the messages. Save the completed survey forms if desired.
4. Add a follow up flag to each of the messages.
5. Move all of the new messages to the **Projects** folder.
6. Mark all the messages in the *Projects* folder as **unread**.

PROJECT 26–3

3-3.1.2
3-3.1.3

1. Reply to all the messages you received from friends and/or classmates about the travel survey. Cc the instructor, if instructed to do so.
2. Write an appropriate response thanking the sender for the response. Be sure to check the spelling and grammar.
3. Send the e-mail.
4. Delete all the incoming and the sent messages that you exchanged in these projects.
5. Delete the Projects folder.

TEAMWORK PROJECT

As mentioned in the lesson, a conversation is created when recipients reply to an original conversation. Partner with at least two other classmates or colleagues and follow the steps below.

1. Delegate one of the team members to send a brief message to the other team members.
2. Each of the recipients will then reply to the original message with a brief response.

3-3.1.2

3. The sender of the original message will then reply to all the responses.
4. After exchanging several messages, review the messages in your Inbox folder to explore how the message thread works.

CRITICAL THINKING

CRITICAL THINKING 26–1

3-3.1.2

In this lesson you learned that there are several ways to organize the message list. The default setting is Date, and most people use that setting. If you were to change the organization settings for the message list, which setting would you choose, and why?

1. Open a new blank Word document.
2. Write a brief answer to the question.
3. Save the document as **CT 26–1**, followed by your initials.

CRITICAL THINKING 26–2

3-3.1.1

When you sign in to an account, you are often prompted to enable the option "Remember me." Explain why you should not enable this option when you are using a public computer?

1. Open a new blank Word document.
2. Write a brief answer to the question.
3. Save the document as **CT 26–2**, followed by your initials.

ONLINE DISCOVERY

In this lesson you learned about the differences between HTML and Plain Text formats. Search the Internet to learn more about the advantages of using the Plain Text format for an e-mail message and the types of devices that support this format.

3-3.1.2

1. Open a new blank Word document.
2. Summarize your findings in a brief paragraph and/or list.
3. Save the document as **OD 26–1**, followed by your initials.

JOB SKILLS

Netiquette refers to conventions to follow when using networks, including network services for e-mail. Use the Internet to research e-mail netiquette guidelines.

1. Open a new blank Word document.
2. Create a list of at least five guidelines you think are important when exchanging e-mail messages.



3-3.1.2

3. Save the document as **JS 26–1**, followed by your initials.

EXPLORE AND SOLVE

When you do not get a response from an e-mail message, you begin to wonder if the recipient(s) received the message.

1. Explore the Outlook options to receive delivery and read receipts that confirm that the recipient received and viewed the message.
2. Open a new blank Word document.
3. Summarize your findings by describing how to enable the delivery and read receipts options in Outlook.



3-3.1.3

4. Save the document as **ES 26–1**, followed by your initials.



Estimated Time:
1 hour

LESSON 27

Communications and Collaboration

OBJECTIVES

Upon completion of this domain, you should be able to:

- Define time-shifted and real-time communication methods.
- Describe the features and proper use of blogging, text messaging, and chatting.
- Describe the features and proper use of audio-visual communications.
- Describe the features and proper use of social media sites.
- Identify the advantages and disadvantages of electronic communication.
- Identify the guidelines for creating effective personal and professional communications.
- Identify common electronic communication standards.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

chatting

cyberbullying

flaming

interactive whiteboard

libel

Multimedia Messaging Service (MMS)

netiquette

podcast

real-time communications

Short Messaging Service (SMS)

slander

social media

tags

text messaging

time-shifting mode

video chat

video conferencing

VoIP (Voice over Internet Protocol)

Web conferencing

Microsoft product screenshots used with permission from Microsoft Corporation.

Growing developments in technology are creating new opportunities to quickly and easily find and share information and communicate with others from virtually anywhere in the world. The availability to deliver a message to any device or person at any time and in any place, changes how we communicate and collaborate with others in a profound way.

Defining Time-Shifting and Real-Time Communication Methods

Social networking, chat rooms, blogs, message groups, and forums are part of our daily sources of interaction. Using collaborative communication tools enables us to share information with one other person or an unlimited number of people.

In addition to sharing text messages, you can engage in other types of correspondence including live voice, full-motion video, and interactive desktop sharing. A combination of the preceding communication methods may be used, especially for group collaboration. For example, a group of people who live in different parts of the country may be enrolled in the same online class. This group can use e-mail, instant messaging, file sharing, and video chatting to communicate about a class project. They could also use a blog to post project updates and social networks to keep in touch with each other. (See **Figure 27–1**.)



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FIGURE 27–1 Collaborative communication

Time-Shifting Communications

When you send messages by e-mail, post information on a bulletin board, or publish a blog, there might be a significant delay between the transmission and the receipt of the information. This type of communication is referred to as ***time-shifting mode***. The receiver can choose when they want to review the information.

The primary use of a blog (short for Web log) is for individuals to post a personal diary or journal on a Web site to share his or her observations and opinions. People who respond to the comments in the blogs are notified when the blog is updated. Users attach ***tags***, keyword descriptions to identify images or text, to simplify the search process.

Blogs are also used for marketing. Companies use the blogs to provide customer feedback and links to several other Web sites.

Like many companies, Microsoft hosts blogs to communicate with customers. In the following Step-by-Step exercise, you will visit a Microsoft blog for Windows users.

VOCABULARY

time-shifting mode

tags

Step-by-Step 27.1

IC3 3-3.2.3 3-4.1.1

1. Open **Internet Explorer**.
2. In the Address bar, type **windowsteamblog.com** and then press **Enter** to display the home page for Windows blogs (see **Figure 27–2**). Blogs change regularly, so the content displayed on your screen will most likely differ from the figures.

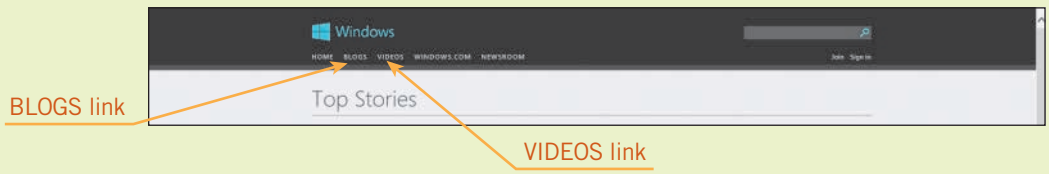


FIGURE 27–2
Windows Blogs home page

3. Click the **BLOGS** link in the header, and then click **Blogging Windows** to display the most recent posts for the Blogging Windows blog (see **Figure 27–3**).

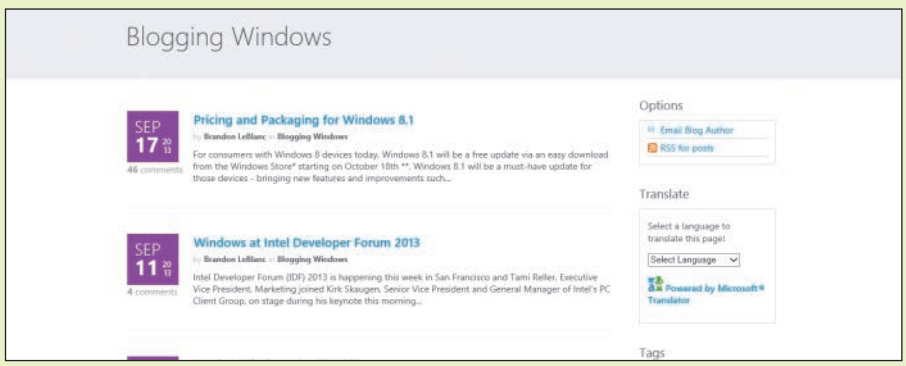


FIGURE 27–3
Most recent posts

4. Scroll down through the list to preview the topics, and if desired, select a blog and read it.

5. Return to the top of the page and then click the **VIDEOS** link in the header to open the Windows YouTube page that displays a showcase of Windows videos (see **Figure 27–4**).

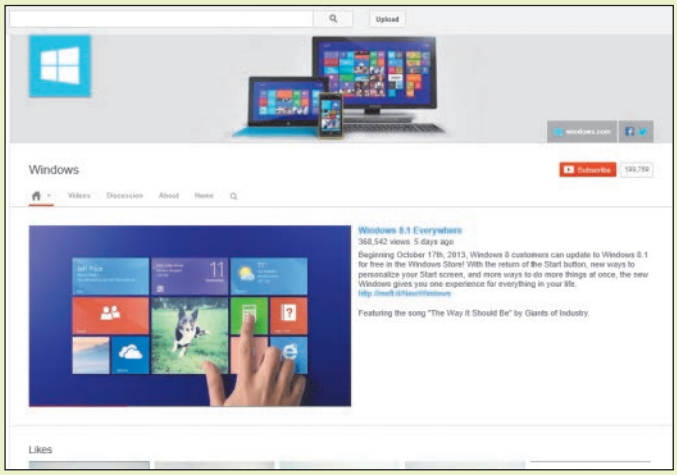


FIGURE 27–4
Showcase of Windows videos

6. Scroll down through the list to preview the videos, and if desired, select and watch one of the videos.
7. Close the Internet Explorer window.

VOCABULARY
netiquette
real-time communications

Just as etiquette applies when sending e-mail messages, ***netiquette***, a combination of the words net and etiquette, refers to good manners and proper behaviors when communicating through electronic media. Below are some simple netiquette rules to follow when blogging:

- Write original content and take responsibility for what you write. Do not plagiarize someone else's content or steal their ideas and present them as your own.
- Proofread and check your grammar and spelling. The quality of your writing is a reflection of your credibility.
- Respond to those who write comments on your blog.
- If you are quoting others, or sharing their ideas, give them the credit and provide links to those sources.
- When you write a comment on someone's blog, use kind and polite words. Say something substantial and useful, and avoid negative comments.

Real-Time Communications

Real-time communications occur instantly or without noticeable delay. In other words, they are "live" connections. Real-time responses are often understood to be in the order of milliseconds, and sometimes microseconds, so they make it faster and easier for people to connect and to access and share information. There are a variety of electronic methods available for real-time communication and collaboration. The communication method you use depends on the people with whom you are corresponding and the topic of the correspondence.

Text Messaging



3-3.2.1
3-4.1.2

Text messaging, often referred to as texting or Instant messaging (IM), is a text-based form of communication primarily used for conversational text. It is best used when correspondence needs to be accessed in real time. It is especially useful when you want instant feedback and you don't have time to have a telephone conversation, or if you are in a public environment and you don't want others to hear your conversation.

Text messages can be sent from a computer, a cell phone, or another mobile device. The conversation is initiated when the sender sends a message. The message system generally alerts the recipient, and then the recipient can immediately read the message without waiting. However, the recipient can choose to read the text message at a later time. The recipient can respond to the message, if desired. If the recipient's device is powered off, the message can still be delivered later. Another benefit of a text message is that it can be saved on both the sender's and the receiver's device. See **Figure 27–5**.

VOCABULARY

text messaging

Short Messaging Service (SMS)



© Steven Frame / Shutterstock.com

FIGURE 27–5 Text messaging

IM technology has been constantly changing. Introduced in 1994, ***Short Messaging Service (SMS)*** technology initiated the development and growth of text messaging. SMS is a service provided by phone, Web, or mobile communication systems for text messaging. SMS uses standardized communications protocols to allow devices to exchange short text messages up to 160 characters.

ICQ was the first Internet-wide instant messaging service, first developed and released by an Israeli company in 1996. ICQ is not an acronym; ICQ is shorthand for "I seek you," referring to finding friends and family for conversation. Instead of establishing usernames, ICQ created a unique identification number (UIN) for each user. America Online (AOL) acquired ICQ in 1998 and then sold ICQ to Digital Sky Technologies in 2010.

AIM (an acronym for AOL Instant Messaging) is a free service that was launched by AOL in 1997. With AIM text messaging you can follow your friends, post status messages, photos, and even videos to stay connected in real time. AIM is available on Windows and Mac computers, mobile phones, and other devices. AIM Express, which is also a free download, enables you to send instant messages from a Web browser. You can add a variety of accounts to AIM including Facebook, Twitter, and YouTube.

VOCABULARY

Multimedia Messaging Service (MMS)

chatting

Multimedia Messaging Service (MMS) extends the core capability of SMS and enables you to send messages that include multimedia content. MMS is most commonly used for communication between mobile phones. With MMS you can send pictures, sound effects, emoticons, and audio and video files via your phone. MMS does not have a limit on the number of characters, but if a message is longer than 160 characters, the message may be delivered in multiple segments.

Apple provides iMessage, a free service for iOS-powered devices such as the iPhone and the iPad. Users can send an unlimited number of messages, as well as photos, videos, Web links, contacts and location information.

Today there are several free IM software programs available that enable users to interact with others using different IM programs. Many of the IM programs, such as Windows Live Messenger (formerly MSN Messenger), Yahoo! Messenger, and Google Talk offer features such as the ability to play games, share files, listen to music, video-chat, and personalize messages with emoticons. IM technology will continue to change with new features and capabilities.

Primarily, texting is considered a casual form of communication, but it should still be done the proper way. The following are suggested rules for proper use of texting.

- Do not use text messaging for formal conversations such as invitations or to deliver bad news. Some conversations require face-to-face communication.
- Use simple words and sentences to clearly convey your message. Avoid using sarcasm and irony because your message may be misinterpreted.
- Your message reflects your credibility, so be careful what you say and always use correct punctuation and grammar.
- Use standard capitalization. Do not use ALL CAPS, which are equivalent to shouting, because shouting is not appropriate.
- Choose appropriate times to text, such as when you are waiting at the bus stop. It is rude to interrupt a face-to-face conversation by reading or sending a text message. Limit your texting when you are with a group of people. You should be interacting with those who are around you. Texting during working hours depends on the opinions of your boss and your work environment.
- Do not forward spam messages.
- Before you send the message, double check the address to make sure you are sending it to the intended recipient(s).

Chatting

3-3.2.1
3-3.2.2

Chatting is talking to other people in real-time on the Internet. Most commonly, the "talk" is created with typed messages, but a chat can also be conducted using sound or sound and video. Chatters exchange their comments in a chat room provided by a network or online service such as Gmail Chat or Windows Live Messenger. Chat sessions can involve anywhere from just two chatters to hundreds of chatters.

QUICK TIP

Some chat services enable you to save a chat history for later reference.

Chats are focused on a selected topic, providing an opportunity for people to connect and interact with others who share common interests. The chat discussions can be ongoing, or the chat session can be arranged for a specific time and for a designated duration. During chat sessions, photos, files, and links can be shared. Chatters can enhance their comments by using animated emoticons, color themes, buzzes, and other features. See **Figure 27–6**.



© payphoto / iStockphoto.com

FIGURE 27–6 Online chatting

Being polite is important for all conversations, whether they are face-to-face or online. To ensure that you have a positive experience, you need to demonstrate proper netiquette in a chat room.

- Introduce yourself when you enter a chat room. Greet new chatters when they enter the room.
- Treat people with respect and dignity, the same way you would if you talked to them face-to-face.
- Stay on topic and use straightforward and concise sentences. Use emoticons to show how you feel.
- Use appropriate language and show respect in your choice of words. Ignore offensive comments.
- Do not use ALL CAPS or excessive exclamation points. It looks like you're shouting.
- Be patient and allow other chatters time to respond. Do not interrupt other chatters.

Audio-Visual Communication

IC3 3-3.2.2

Business and education environments benefit from using audio-visual communication methods. ***VoIP (Voice over Internet Protocol)*** is technology that enables the delivery of voice communications and multimedia sessions using Internet Protocol. VoIP is widely used to conduct online meetings and training. The connections can be at home, at work, in a corporate network, or during travel.

A ***podcast*** is a method of publishing files (primarily audio files) to the Internet that can be downloaded for playback on a computer or a mobile device. Podcasts provide an effective way for businesses and organizations to deliver content for a variety of topics. They provide a convenient way to listen to what you want and when you want. For example, you can listen to a podcast during your commute to work.

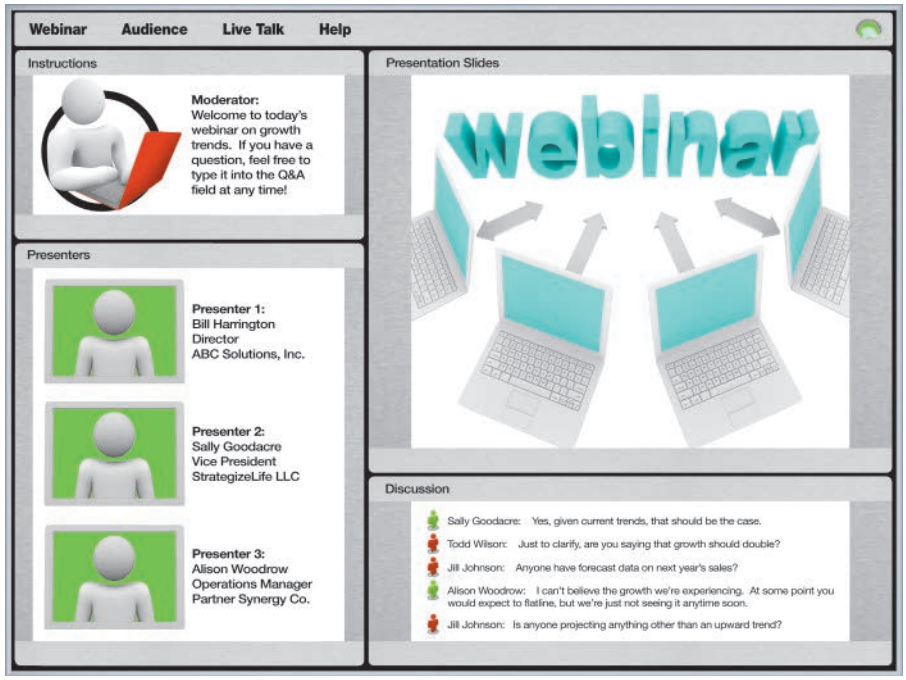
VOCABULARY

VoIP (Voice over Internet Protocol)

podcast

VOCABULARY
Web conferencing

Web conferencing (also referred to as a Webinar) is a presentation, lecture, workshop, or seminar that is transmitted over the Web. Presenters are able to deliver a presentation over the Web to a group of participants in different geographic areas. Web conferencing systems include features such as texting, VoIP, and full-motion video. Sometimes there is a limit for the number of participants in a session. Participants listen to the presenter as the presenter shares applications, or their entire desktop. Although participants are not able to interact during the presentation, they can usually ask questions and share comments after the presentation in a chat session or via an audio transmission. See **Figure 27–7**.



© iQoncept / Shutterstock.com

FIGURE 27–7 Web conferencing

Even though you have limited interaction with the presenter, and the presenter doesn't see you (or even know who you are), that does not mean that you can ignore rules of netiquette. Follow these rules when participating in a Web conference.

- If you reserve a spot for an upcoming Web conference, participate as planned. If you cannot attend the conference, cancel your reservation in advance so that someone else can sign up for the session.
- Sign in by the scheduled time and before the session begins.
- Use the mute button to eliminate background noise.
- If provided the opportunity to interact, ask relevant questions and make positive comments.

VOCABULARY
video conferencing
interactive whiteboard
video chat

Video conferencing is using computer networks to transmit audio and video data. Video conferencing has become an essential tool in business, education, medicine, and media. With a single click, employees can launch a meeting with co-workers, customers, or clients. When conducted properly, the electronic communication can be as effective as a face-to-face meeting, and all those involved don't even need to leave their desks. See **Figure 27–8**.

In the business environment, interactive whiteboards are commonly used in a video conference. An ***interactive whiteboard*** is a computer program that allows participants in a video conference to interact and make changes to a document. Participants can simultaneously enter and edit text and graphics and highlight areas in a document.



© Andrey_Popov / Shutterstock.com

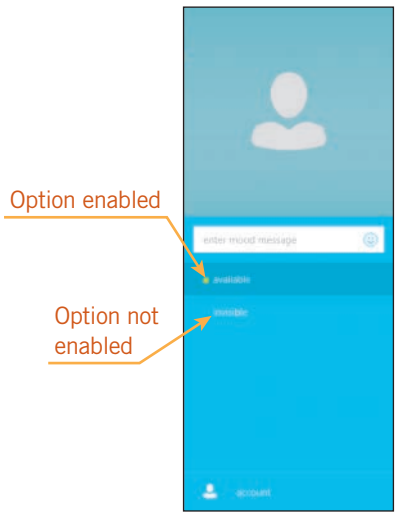
FIGURE 27–8 Video conferencing

Cameras, microphones, and speakers are often built into mobile devices and enable you to video chat with friends and colleagues. ***Video chat*** is where you see the person with whom you are talking. Programs such as Gmail chat, iChat, Windows Live, and Skype provide video features, enabling you to video chat with anyone around the world.

When you participate in video conferences, you should show the same courtesy and etiquette that you would show in a professional meeting. Below are some guidelines to follow to reflect professionalism and credibility:

- Gather pertinent information in advance and be prepared.
- Dress appropriately and be properly groomed.
- Silence your mobile phone and other devices so that incoming calls and alerts do not interrupt the meeting.
- Don't interrupt the conversation. Wait for your turn to speak.
- When not speaking, use the mute button to eliminate background noise.
- Remain aware of your facial expressions and body language.

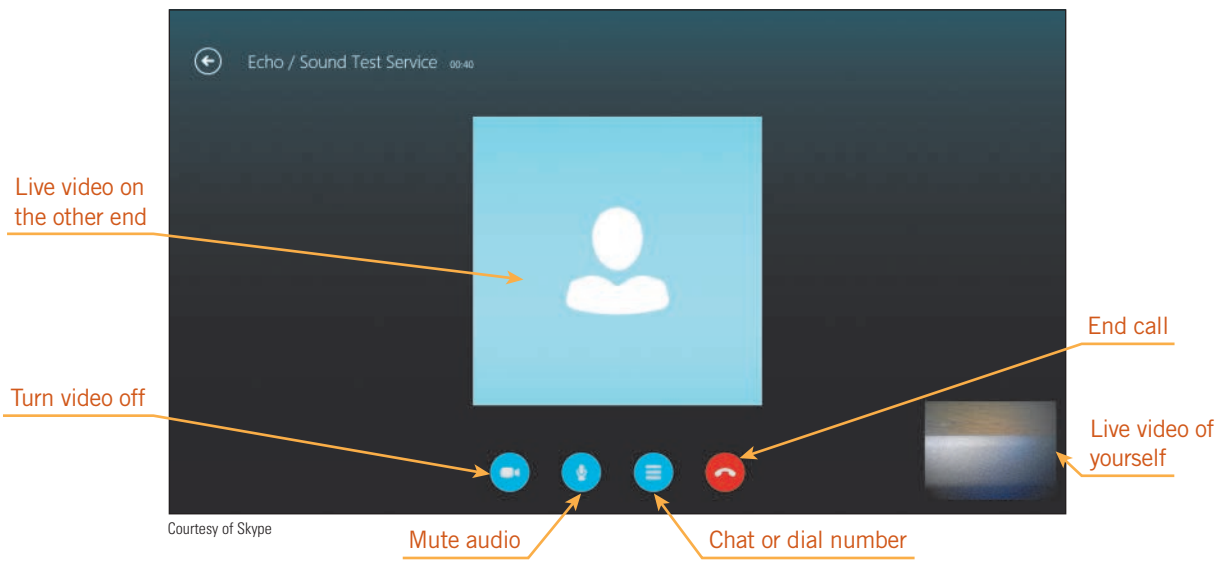
The VoIP service Skype enables you to communicate with friends, family, and colleagues by voice, video, and instant messaging. You can also share files and your desktop screen. Skype is available on computers, mobile devices, TV, and even a traditional landline. You can connect with anyone else who is using Skype and create a group connection with up to ten people. When you are online, you can enable options to let others know you are available. If you don't want them to know you are online, you can enable the invisible option. See **Figure 27–9**.



Courtesy of Skype

FIGURE 27–9 Skype available and invisible options

Skype is free when you connect to the service over the Internet. To create a voice connection using a computer or mobile device, you need a microphone. To create a video call using a computer or device, you need a Webcam. During the connection, you can switch between talk and type. See **Figure 27–10**. If you're having a bad hair day, you can turn the video option off during the connection.



Courtesy of Skype

FIGURE 27–10 Skype options for video, audio, and text

The Skype service alerts your Skype contacts when you are online and when they are available for communications. If you don't want people to know you are online, there are settings you can enable for invisible status.

Whether you use video chat for personal or business communications, you should show the same courtesy and netiquette that you would show in a live face-to-face meeting. Video chats are often impromptu, so consider the following before initiating or accepting a request for a video chat:

- Schedule video calls in advance, or ask for approval of a video chat.
- Make sure you, and the person you are contacting, are in an appropriate location. For example, don't video chat from a restroom or a busy restaurant.
- Consider the differences in time zones; your contacts may be on different time schedules.
- Use statuses (available, invisible, away, busy, etc.) effectively.
- Remain aware of your facial expressions.
- Look into the camera, maintain eye contact, and stay motionless.
- Be mindful of background noises, which can be annoying.

Social Media Sites

Social media is a term used to describe a variety of Web-based platforms, applications and technologies that enable people to keep in touch with friends, find people with similar interests, and build relationships online. Social media is also a powerful marketing tool. Some examples of social media sites and applications include Facebook, YouTube, Google+, Twitter, and Instagram. Social networks such as LinkedIn also increase networking opportunities.

VOCABULARY
social media

The information a user shares on a social network may include photos and videos, age and gender, interests, contacts, and geographical location. In addition, users often provide biographical information such as their level of education, their hometown, and their current employer and employment history. Most social networks offer privacy settings so users can grant or limit access to their information. You can group your friends and other contacts, such as friends, family members, or colleagues and then adjust the privacy settings accordingly so that some information is visible to some and invisible to others. For example, you can share your status updates with everyone, but you can limit access to your personal contact information.

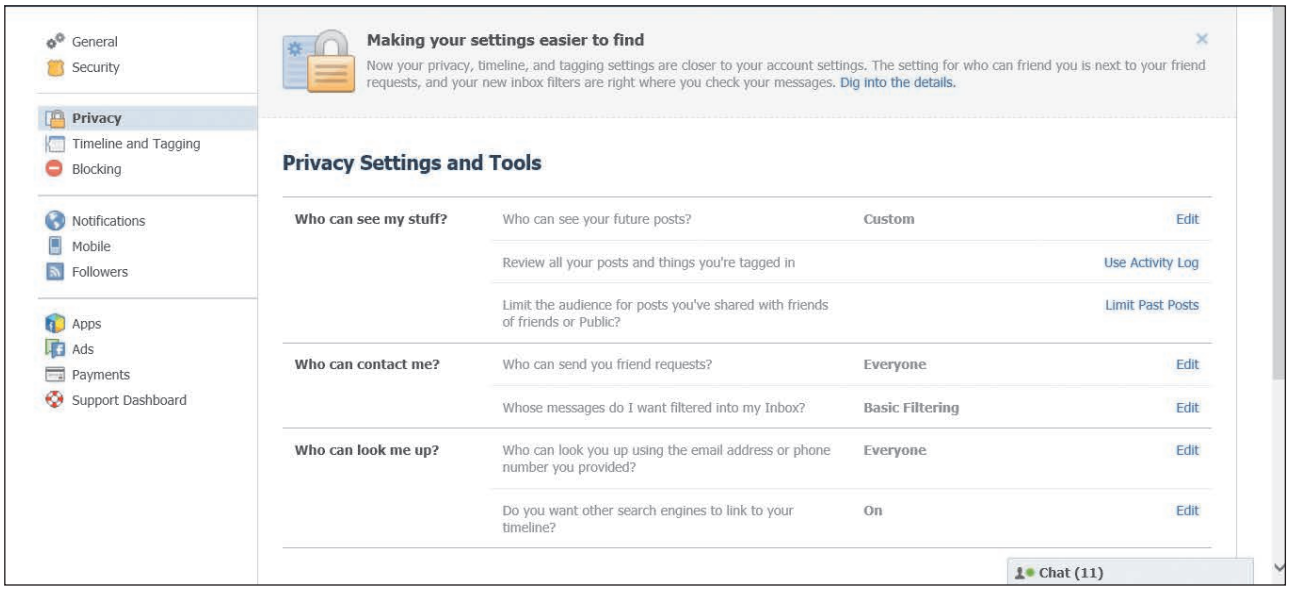
ETHICS IN TECHNOLOGY

Communication Ethics

Ethics is about behavior, not about feelings and opinions. It's about how we treat each other and how we use available resources. The emergence of new electronic communication technology creates new waves of ethical issues, adding emphasis to the need to follow ethical guidelines.

The choices made when using electronic communications reflect values and have consequences. In order to prevent harm to others, which is the basis for any type of ethics, computer developers and users must recognize and responsibly address ethical issues.

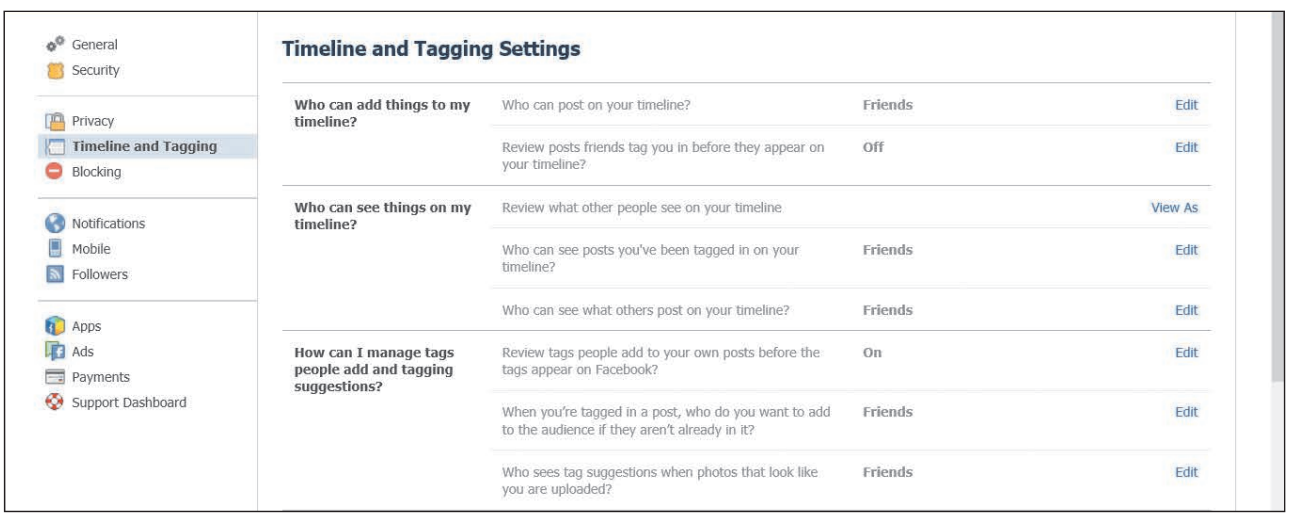
To control your privacy settings, log into your account and look for links such as "Privacy Settings" or "Customize Privacy Settings." The options will most likely include settings to control how people can find you and your personal information. With a public setting, anything you post can be seen by anyone, even search engines. You can restrict who can see your posts, and you can send direct (private) messages to other users. See **Figure 27–11**.



Courtesy of Facebook

FIGURE 27–11 Facebook Privacy Settings

If you want to be invisible when you are online, you can enable settings off. You can choose whether or not you want to allow others to tag you in pictures and videos. See **Figure 27–12**.



Courtesy of Facebook

FIGURE 27–12 Facebook Timeline and Tagging Settings

You can change your online status by sharing information about who you are with, where you are, and so on. When enabled, location apps show your location when you post information. Make sure you only authorize trusted apps (such as games and online polls and quizzes) and Web sites. If you enable options for third parties, they can also gain access to your private information. Also, apps will post to your account, sometimes even if you don't want them to. For example, news outlets will show the articles you have read.

Posting comments on a social network site is like speaking to a crowd of people at a huge gathering. The difference is that comments on a social network site stay with you forever. Therefore, when using social media sites it is important to use proper netiquette, as listed below.

- Think before you post and use common sense. If you wouldn't say it in public, then don't say it online.
- Consider whether you will offend someone when you post the content.
- Use appropriate language. Be polite and consider the tone.
- Don't post inappropriate, unflattering, or embarrassing pictures and videos.
- Don't over share.
- Be accountable for your actions.
- Keep private matters in private messages.
- Use statuses (available, invisible, away, busy, etc.) effectively.
- Give credit where credit is due. When you pass something on or repost the content through social media, include the source.

Identifying the Advantages and Disadvantages of Collaborative Electronic Communication

Electronic communication offers many advantages over other types of communication. Electronic communications enable people to connect worldwide. The communication is convenient and it is not restricted to a specific place and time. Access is available from not only computers but also mobile devices, which allow users to communicate from remote locations and transmit text, graphics, audio files, and video files. Online document sharing allows users to create and edit documents online while collaborating in real time with other users. The Cloud is an example of online document sharing.

You can use more than one type of correspondence, including one-to-one, one-to-many, and many-to-many. In one-to-one communication, one sender communicates with one receiver. E-mail is an example of one-to-one communication. One-to-many communication involves a sender communicating with many receivers. An e-mail message sent from one person to a group is an example of one-to-many communication. Many-to-many communications, such as blogs, chat rooms, and social networks, enable multiple people to communicate simultaneously.

Electronic communication fosters community building by connecting members of a group who share the same general interest. The community could be connected by a social media site, blog, mailing list, message board, or other type of electronic communication, which allows them to exchange information and organize their efforts to meet a goal.

Depending on the type of communication, costs can be minimal or even free in some instances. E-mail, for example, is a service that is part of most networked computers. Price remains the same whether you send and receive a hundred e-mail messages or a thousand e-mail messages. Based on the device that is being used, instant messaging is a free service or has a minimal fee. On the other hand, business video conferencing generally involves a fee for the host. However, using this service can eliminate travel expenses for people who would otherwise need to meet in person.

There are also some disadvantages to using electronic communication. After sending a message, you may not be aware that there is misconception of your correspondence. When you meet with people face-to-face, you can read their body language and watch their facial expressions as they react to your message.

There are security risks when you use electronic communications. Users may misuse and abuse shared computing resources. Furthermore, your computer can be hacked and your confidential and sensitive information can be stolen. Also, your computer can be affected with a computer virus, which can corrupt data.

Consider the consequences. Be aware that electronic communications can leave an "electronic trail." Messages left on public sites such as blogs, message boards, or posts to social networking sites can be publicly and even permanently accessible.

Staying in touch with friends, family, and colleagues, and using time efficiently is valuable, but excessive use of online communications can cause problems. It is important that individuals also connect with people in a physical presence. The lack of personal interaction can damage relationships and even reduce overall productivity.



3-4.1.1
3-4.1.3

Creating Effective Communications

Collaboration and communication are at the center of today's enterprise, but unlocking maximum results requires more than simply deploying the right technology tools. To be effective in communication, you must understand and respond to the needs of the recipient.

Select a communication method that suits the purpose of the message and the audience. Keep in mind that even though you can conduct verbal, written, and face-to-face communications using a variety of electronic communication methods, meeting with a person physically or making a phone call to discuss a topic might be the most beneficial means of communication. Likewise, sending a handwritten note is more sentimental and adds a personal touch.

The level of formality and informality is based on the people with whom you are corresponding and the topic of the correspondence. The content, tone, and format of the message should be appropriate for its audience. The purpose should be clearly stated, and the content should be sensible. It's not only what you say, but also how you say it. Regardless of whether the message is formal or informal, the message should not contain spelling or other errors.

When conducting business and professional communications, such as scheduling a meeting or responding to an inquiry, the message should be clearly stated with a formal tone. Business messages should be about the reader and not the writer. The "U" comes before the "I" in business. When composing a business message, assume that the reader has limited time and most likely will skim the contents to find the main idea. However, do not use abbreviations. Even though abbreviations may save you time as you compose the message, they will not save the reader time, and the correspondence will lose its credibility.

Personal and social messages, such as a note to a friend, can be either formal or informal with a relaxed tone. Avoid using sarcasm or too much humor unless the message is to someone you know very well. Adding elements such as emoticons, abbreviations, jokes, and other informal elements are appropriate for some audiences, but not all.

Respond to messages promptly. The type of message often dictates response time. For example, if a customer needs immediate assistance or has a complaint, you should reply within 30 minutes to 2–3 hours. If a student needs assistance on how to upload an assignment for his online class, the response time should be within 5–10 hours. Other nonemergency responses should be made within 24 hours.

Following Electronic Communication Standards



3-4.1.1
3-4.1.4
3-4.1.5

Although freedom of speech is an important right, you must still be cautious about what you say in electronic communications. Do not make derogatory remarks. Statements and information you publish for both private and public review can harm people in many ways.

Flaming (bashing) is an intense, online verbal argument. The hostile and verbal interaction involves angry, mean, and vulgar language. ***Cyberbullying*** is using Internet technology to intentionally harass, threaten, embarrass, or target another person. Flaming and cyberbullying can have a negative emotional effect on victims, ranging from hurt feelings to intense anger and even depression.

VOCABULARY

flaming

cyberbullying

slander

libel

Also, do not post false statements. ***Slander*** (an oral communication) and ***libel*** (a written communication) are untrue statements that can damage a person's or a company's reputation or character. Posting untrue or threatening information can have serious consequences for the individual who makes the statement. Defamatory statements and threats are unlawful communications, and the person who makes these statements can be sued for damages or may even be sentenced with jail time.

Most companies, educational institutions, government agencies, and other businesses and groups have guidelines for the use of electronic communications within the organization. In order to function well, and for their welfare, organizations depend on these rules of conduct. Review and apply the rules of netiquette, school policies, cultural issues, and other guidelines. For business communications, certain rules of etiquette and formality should be applied similar to those used in other business communications. The following is a list of general guidelines for using all types of electronic communications.

- Make sure you are using the appropriate medium for conveying the message.
- Clearly convey your message. Use proper grammar and spelling.
- Respect the privacy of others and honor confidentiality. Refrain from communicating sensitive information.
- Understand the sensitive nature of data and of the rules related to sending data electronically.
- Back up and archive correspondence on a regular basis.
- Cite sources for intellectual property, and give credit to others when sharing their ideas.
- Avoid harm to others.
- Do not send unsolicited bulk messages (spamming).

SUMMARY

In this lesson, you learned:

- Exchanging messages involves both time-shifted and real-time communication methods.
- Blogging, text messaging, and chatting are convenient methods for text communications.
- Audio-visual communications enable the delivery of voice communications and multimedia sessions.
- Social media sites enable people to keep in touch with friends and build relationships online.
- Although electronic communications offer many advantages over other types of communication, there are also some disadvantages.
- Communications netiquette refers to good manners and proper behaviors when communicating through electronic media.
- Creating effective communications involves more than deploying technology tools.
- Regardless of the type of electronic communication, users should be aware of and follow electronic communication standards.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. The primary use of a blog is for individuals to post a personal diary or journal on a Web site.

T F 2. Most companies, institutions, government agencies, and other organizations have guidelines for the use of electronic communications.

T F 3. Personal and social messages should never be formal.

T F 4. The type of message often dictates response time.

T F 5. When texting and chatting informal messages, correct spelling and grammar can be ignored.

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided:

1. _____ is a written communication that is an untrue statement that can damage a person's or a company's reputation or character.
2. _____ extends the core capability of SMS and enables you to send messages that include multimedia content.
3. _____ refers to good manners and proper behaviors when communicating through electronic media.
4. A(n) _____ is a presentation, lecture, workshop, or seminar that is transmitted over the Web.
5. When you see the person with whom you are talking, it is referred to as _____.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is the advantage of using real-time communications?

2. When is text messaging best used?

3. How does chatting differ from texting?

4. What is the limit on the number of characters in an MMS message?

5. What are the benefits of using an interactive whiteboard during a video conference?

6. How can meeting with people face-to-face be better than using a means of electronic communication?

7. What should you consider when choosing an electronic communications method?

8. When deciding on the level of formality of a message, what two factors should you consider?

9. What is a many-to-many type of correspondence?

10. How do companies use blogs as a marketing tool?

PROJECTS

PROJECT 27–1



3-3.2.1
3-4.1.1
3-4.1.2

You made plans to meet a friend for lunch today at noon, but your morning schedule hasn't gone as planned. You're in the waiting room at your doctor's office, and the doctor is running behind schedule. It looks like you will be delayed by at least 30 minutes.

1. Write a proper text message.
2. Submit the message to your instructor as directed.

PROJECT 27–2



3-4.1.3

Think about your daily communications and the types of electronic communication that you use.

1. Create a list of the people with whom you communicate daily, and how you communicate with them. For example, you exchange e-mails with classmates and instructors, you send text messages to your friends and family, and you use social meeting to keep up with friends.
2. Review the list and evaluate the communication methods you are using. Is there a more efficient or better way to communicate? For example, at work have you been calling multiple clients, but could you save time by e-mailing messages to those clients? Or, have you been texting people and you now realize that you should probably call them or send a more formal message in an e-mail?
3. Make a list of actions you can take to improve your personal and professional communications, using either electronic communication methods or physical presence.

PROJECT 27–3



3-3.2.2

To complete this project, you will need a microphone and a Webcam.

You have a new friendship that you established online. Reading posts, you learned that you and this person have a lot of common interests. The two of you have never met face-to-face, so you want to video chat.

1. Find a partner who has the same type of social media accounts as you, such as Facebook, Gmail chat, or Skype, so that you can video chat. (Do not worry if you already know this partner; you will role play the part.)
2. Decide which one of the partners will initiate the communication.
3. Both partners log into their social media account. The designated partner initiates the video connection, and the other partner accepts the communication.
4. Role play as though you are meeting each other face-to-face for the first time.
5. End the online discussion.
6. Discuss with your partner what went well during the communication and also what could have made the communication more effective, such as eliminating background noise or choosing a better environment.

TEAMWORK PROJECT

The following activity will give you an opportunity to practice chatting with others.

1. Create a chat group of 3–5 people who have the same type of social media accounts as you, such as Facebook, Gmail chat, or Skype.
2. Choose a discussion topic and designate one of the group members to initiate the chat session.
3. Each group member logs into their account.
4. The designated individual initiates the chat session.
5. Everyone starts chatting, following proper netiquette.
6. After five minutes of chatting, end the chat session.
7. Discuss with the group members the quality of the content and the value of the discussion. Be sure to use constructive criticism.

3-3.2.1
3-4.1.2

CRITICAL THINKING

CRITICAL THINKING 27–1

You want to invite some family members to a surprise birthday party for one of the family's best friends. What means of communication would you choose, and why?

3-3.2.1

CRITICAL THINKING 27–2

Texting is especially useful when you want instant feedback and you don't have time to have a telephone conversation or if you are in a public environment and you don't want others to hear your conversation. Describe a situation where you think it is not appropriate to text and instead you should call that person.

3-3.2.1

ONLINE DISCOVERY

Although it wasn't the first networking site, Friendster was one of the first popular social media sites in the United States. Use the Internet to research the history of Friendster. Then answer the following questions. Be sure to cite your source(s).

1. In what year was Friendster launched?
2. What was the purpose and what features did Friendster offer when it was first launched?
3. Is Friendster still available today?
4. Share your findings with your classmates and compare the information. Facts may differ depending on the resource.

3-3.2.3

JOB SKILLS

Many work projects in all fields involve collaborating with others. Even if you work in the same location, this collaboration often uses a form of electronic communication.

1. Interview someone, either in physical presence or via e-mail or phone call, who uses electronic communications in the workplace. Ask them if they prefer to communicate with their colleagues face-to-face or if they prefer corresponding by using electronic communications. Ask them to explain why.
2. Create a summary of the interview responses. Submit the summary to your instructor as directed.

3-4.1.3

EXPLORE AND SOLVE

In this lesson you learned that some chat services enable you to save a chat history for later reference. If you generally participate in chat rooms or chat sessions, check the service provider's settings to see if and how you can save a chat history.

3-3.2.1



Estimated Time:
1.5 hours

LESSON 28

Using the Internet and the World Wide Web

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Define the Internet and the Web.
- Set up and troubleshoot an Internet connection.
- Define data usage and how it is calculated.
- Categorize Web sites.
- Navigate Web pages and use a browser effectively.
- Customize browser settings and manage plug-ins.
- Manage browsing history.
- Organize favorite Web sites and refresh Web sites.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

browser plug-in
cache memory
domain
domain name
firewall
gateway
home page
hotspot
hyperlink
Hypertext Markup Language (HTML)
Hypertext Transfer Protocol (HTTP)
Internet
Internet service provider (ISP)
portal
streaming
subdomain
Uniform Resource Locator (URL)
Web app
Web browser
Web site
Wi-Fi
wiki
World Wide Web

Microsoft product screenshots used with permission from Microsoft Corporation.

Each day millions of people use the Internet and the World Wide Web at work, at home, and while traveling. Anyone with access to the Internet can connect to and communicate with other Internet users anywhere in the world.

3-1.1.1
3-1.1.2
3-1.2.1
3-1.2.2

Defining the Internet and the Web

Many people use the terms Internet and Web interchangeably. In reality, they are not the same. The Internet can exist without the Web, but the Web cannot exist without the Internet. The ***Internet*** (often referred to as the Net) is a huge global interconnection of computer networks around the world. The ***World Wide Web*** (often referred to as the Web and abbreviated as WWW or W3) is a global collection of interconnected documents (Web pages) and other resources.

A ***Web site*** is a Web page or a collection of related Web pages located on the Web. The pages within the Web site can contain text, images, and multimedia elements such as audio, video, and animation. ***Hyperlinks*** (often referred to as links) are an essential part of the Web, because they automatically connect you to another part of the same Web page or to another Web page. A Web page link can be a word, a phrase, or a graphic.

HyperText Markup Language (HTML) is the main markup language used to create Web pages. HTML defines the format and layout of a Web document. Just as most filenames include an extension to identify that file type (such as .docx for a Word document or .jpg for a graphical file), the Web page file often includes a file extension to indicate the file type. For example, the extension may be .html or .shtml. SHTML is an HTML file that includes special commands for the server to process.

The Web pages are transferred between computers via ***HyperText Transfer Protocol (HTTP)***, which is the underlying protocol for the Web. This protocol defines how messages are formatted across the Internet. An HTTP client program is required at one end, and an HTTP server program is required on the other end. (Recall that a client is a type of computer program that makes a service request from a server.)

Each Web site possesses at least one Internet Protocol (IP) address. The ***Uniform Resource Locator (URL)*** (often referred to as a Web address) identifies the unique IP address. URL addresses are presented in alphanumeric form because it describes the resource and makes it easier to remember (such as http://www.cengage.com). However, the actual URL is a set of four numbers separated by periods (such as 212.987.12.3), and the Domain Name System (DNS) translates the alphanumerical address to a numeric address.

A ***domain*** is a group of computers and devices on a network that are administered as a unit with common rules and procedures. All devices sharing a common part of the IP address are said to be in the same domain. The ***domain name*** provides an online identity (such as an organization or company name). If your Web site has a lot of information to organize, you can create a ***subdomain***, which is a domain that is part of a larger domain and is dependent on the larger domain. A subdomain is like a folder under your root directory.

Every Web site domain name also ends with a two- or three-letter extension which identifies the type of domain or the country of origin. There are various domain types, and each type has its own basic rules such as the type of characters and the minimum and maximum number of characters. Some of the most common domain types and are described in **Table 28–1**.

VOCABULARY

Internet

World Wide Web

Web site

hyperlink

HyperText Markup Language (HTML)

HyperText Transfer Protocol (HTTP)

Uniform Resource Locator (URL)

domain

domain name

subdomain

ABOVE AND BEYOND

Essentially, the Internet is a free and open broadcast medium of hardware networking. No single person or entity owns the Internet, and there is no central governing body. Organizations including the Internet Corporation for Assigned Names and Numbers (ICANN), the National Science Foundation, and the Internet Architecture Board (IAB) oversee and maintain the technical rules and hardware/software standards.

TABLE 28–1 Domain Types

EXTENSION	DESCRIPTION OF DOMAIN TYPE
.biz	Business (the phonetic spelling of the first syllable of "business"); associated with business/commercial and personal Web sites
.com	Commercial; associated with business/commercial and personal Web sites; most popular
.edu	Education; associated with educational institutions
.gov	Government; associated with U.S. government
.info	Information; both commercial and personal sites; unrestricted domain
.mil	Military; various branches of the Armed Forces of the United States
.mobi	Mobile; also known informally as dotMobi; dedicated to delivering the Internet to mobile devices via the Mobile Web
.net	Network; initially intended to be used only for network providers; recommended for companies involved in Internet infrastructure; widely used
.org	Organization; mostly associated with nonprofit organizations

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Domain types and extensions are also assigned to a specific country. For example, England is .uk, Canada is .ca, Japan is .jp, and Spain is .es. Accredited registrars manage the registrations of domain names.

Once the domain name is registered, a Web hosting service makes the Web site accessible via the WWW.

A URL always includes a protocol, the domain name, and the domain type or a country code. As shown in **Figure 28–1**, after the single forward slash /, the URL may also include a resource ID which provides the name of the file and any directories or subdirectories under which the file is stored on the specified computer. The domain name is the most easily recognized part of the URL.

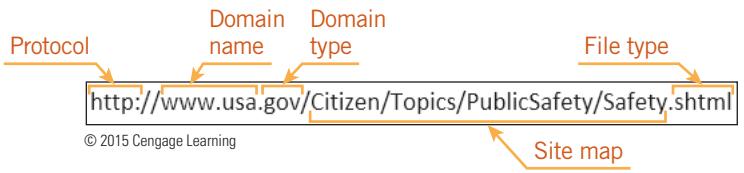


FIGURE 28–1 Parts of the URL

ABOVE AND BEYOND

The World Wide Web Consortium (W3C) is an international community where individuals and organizations around the world work together to develop standards for Web content accessibility.

A ***Web browser*** is a software application you use to view and retrieve documents from the Web and to display the documents in a readable format. Browser software (such as Microsoft Internet Explorer, Safari, Google Chrome, and Mozilla Firefox) sends a message to a Web server to retrieve a requested Web page. For example, when you enter a URL in your browser, you send an HTTP command to the Web server to tell it to locate and transmit the requested Web page. The browser then extracts the HTML code to display the page.

VOCABULARY

Web browser

3-1.1.1
3-2.1.2

Connecting to the Internet

In homes, the common methods of Internet access include dial-up, broadband, satellite, 3G/4G technology for cell phones, and Wi-Fi. ***Wi-Fi*** uses radio waves to provide wireless high-speed Internet and network connections. When you are away from the office or home, you can use Wi-Fi hotspots to connect to the Internet. A ***hotspot*** provides Wi-Fi network access (usually Internet access) to a small area for wireless-enabled devices such as laptops, tablets, and smart phones.

VOCABULARY

Wi-Fi

hotspot

Internet service provider (ISP)

Setting Up an Internet Connection

3-1.1.1
3-1.1.3
3-2.1.1

Before you can access the Internet, you must connect to it. An ***Internet service provider (ISP)*** is an organization or company that provides connectivity to the Internet through a telecommunications line or wireless system. Its service is primarily to provide a connection to the Internet.

Different types of Internet connections provide a range of options. Be prepared to balance the features you want, such as connection speed and reliability, with the cost and availability of the options. For example, a dial-up connection is the least expensive type of Internet connection, but it is also the slowest. Broadband connections such as cable modems and digital subscriber lines (DSL) offer a high bandwidth, which refers to the amount of data that can be transmitted. Broadband connections can transmit multiple channels of information over a single link, so they can carry video, voice, and computer data simultaneously and at a much faster speed.

After you contract an ISP, you must install some type of telecommunications software. This software enables your computer to connect to another computer. Your ISP or online service company provides this software, or most likely you will be able to use software already installed on your computer. Most new computers are set up for a wireless connection.

When you connect to the Internet, you will need a Web browser to display Web pages. Most computers purchased today come with a browser already installed. For example, Internet Explorer 11 is installed with Windows 8.1. Other popular Web browsers include Mozilla Firefox, Safari, and Google Chrome.

With the telecommunications software and a browser installed, you are ready to connect to the Internet. If you are using a dial-up modem, you may have to give instructions to your computer to dial a local telephone number, but if you have a high-speed dedicated phone line, a cable connection, or a wireless service, you just start your browser. This connects you to your ISP's computer, which in turn connects you to the Internet. You are then online with the world.

Access to the hotspot services may be free to all, free to customers only, or fee-based. You may need a password to complete the connection. A hotspot can be limited to a confined location, such as a restaurant, or it can be more widespread and cover a large area such as a school campus.

The exercises in this lesson assume that you have an Internet connection, such as a broadband or wireless connection.

Touchscreen Users

The instructions in this lesson generally provide directions for using a mouse to access commands and features. For example, the instructions may refer to actions such as *point, click, double-click*, or *right-click*. If you are using a touch screen, you can use gestures such as *press, tap, slide, swipe*, and *drag* instead of following the directions for using the mouse.

Step-by-Step 28.1

1. Open the Start screen.
2. Point to the either the lower-right or upper-right corner of the screen to show the Charms bar, as shown in **Figure 28–2**. (Touchscreen users can swipe from the right to show the Charms bar.)



FIGURE 28–2
Charms bar

3. On the Charms bar, click the **Settings** button.
4. If you are connected to a network, the network icon that displays will look like this. If you are not connected to a network, the Network icon will look like this with the word Available below the icon, which indicates that networks are within range. Click the **Network icon**. A list of available networks displays in the Networks pane as shown in **Figure 28–3**.

QUICK TIP

If you are using Windows 7 or Vista, the network icon displays on the taskbar in the lower-right corner of the screen.

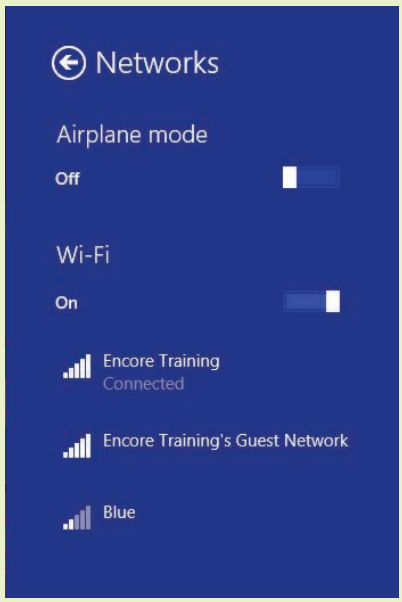
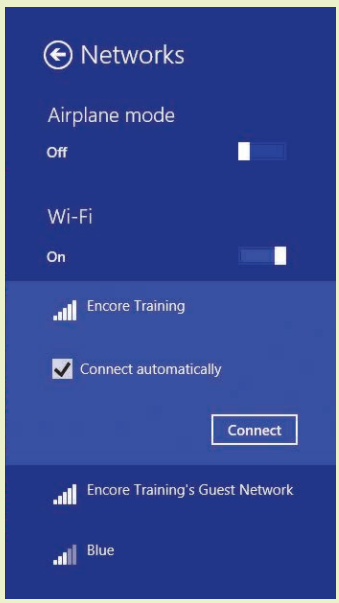


FIGURE 28–3
Available networks

5. Do one of the following options:
   a. If you are connected, the information in the Network will confirm that you're connected and how strong the connection is, as shown in Figure 28–3. Go to Step 6.
   b. If you are not connected, click the **Network icon** for the network to which you want to connect. To automatically connect to a network every time you are within range, enable the **Connect automatically** option as shown in **Figure 28–4**. Then click **Connect**. You may need to enter a password to complete the connection.

FIGURE 28–4
Option to connect to network automatically



6. Click a blank area in the Start screen background to close the Networks pane.

IC3
3-1.1.1
3-1.1.3
3-1.2.10
3-2.1.1

Downloading and Uploading Data

Many ISPs, especially for mobile devices, include a monthly data usage allowance, and if you exceed the limit for your plan, you may pay an extra fee. Therefore, it is important that you understand how data usage occurs and how it is calculated.

Almost every time you access the Internet, you will download (receive) or upload (send) data. When you browse the Internet, visit a Web site, send text messages and e-mail messages, and post pictures on social networks, you are using data. ***Streaming*** is a technique for transferring data in a steady and continuous stream so you can start displaying the data before the transmission is completed. For example, you can start watching an online video before the entire file has been transmitted. Even though the video file may not be stored on your computer, the data is still downloaded in some form.

VOCABULARY
streaming

The data is transmitted in packets, and the size of the packet is defined with the following terms:

- bits—the smallest possible unit of information
- kilobit—1,000 bits
- bytes—8 bits
- kilobyte—8 kilobits
- megabit—1,000 kilobits
- megabytes—8 megabits

Bytes are capitalized when used in acronyms to distinguish them from bits, since both start with the letter B. For example, Kb is kilobits and KB is kilobytes. Mb is megabits and MB is megabytes. So, how big are the files typically accessed on the Internet? The following is a list of commonly accessed files and a typical size for each. Of course, file sizes vary depending on the amount of content, the format, the resolution, and the level of quality.

1 text e-mail message	75 KB
1-page PDF file	948 KB
Photo	1.5 MB
Web page	1.5 MB
1 music track	5 MB
30 minutes of gaming	25–75 MB
10-minute video	100–200 MB

Internet connection speeds are usually measured in seconds. Kbps (kilobits per second) usually refers to dial-up and low-speed DSL connections. Mbps (megabits per second) is the most common unit of speed used. Generally, ISP services offer different download and upload speeds. For example, a service plan may offer a download speed up to 30 Mbps and an upload speed of 4 Mbps. There are differences in download and upload speeds because most Internet connections are asymmetric, which means the bandwidth capacity for downloading data is different than the capacity for uploading data. For personal use, the average user downloads much more than they upload, so the differences in speeds are acceptable. However, businesses often upload significant amounts of data, so they often subscribe to a higher-level service that provides faster uploading speeds.

Even if you have a high-speed Internet connection, there are times when the transmission of data is very slow. There are several factors that reduce the speed of your Internet connection.

- As mentioned earlier, the connection type is a major factor.
- At peak times, popular Web sites can become overwhelmed with users. As more data is requested and sent, more bandwidth is being used at the same time. Likewise, home networks are often slow when multiple users are connected to the Internet, using multiple browsers. Network administrators for corporate networks monitor Internet use and try to keep employees from downloading large files during peak hours.
- Wireless Internet connections can be slowed down because of devices interfering with the wireless signal. Household appliances such as microwaves, cable TV wires, or a neighbor's wireless network can interfere with your network signal.
- Internet speeds can also be slowed down because of outdated equipment, or equipment that is not configured properly for optimal performance.

3-1.1.3
3-1.2.8

Troubleshooting Internet Connections

Similar to other electronic technologies, Internet connections are not without problems. Losing your Internet connection can be frustrating, especially if you are in the middle of an online conference or uploading important data for others to use. Depending on the problem, you may need to contact your ISP. However, you may be able to repair the problem with the Internet Connections troubleshooter. Windows provides troubleshooting tools to help you identify and resolve problems with your Internet connection.

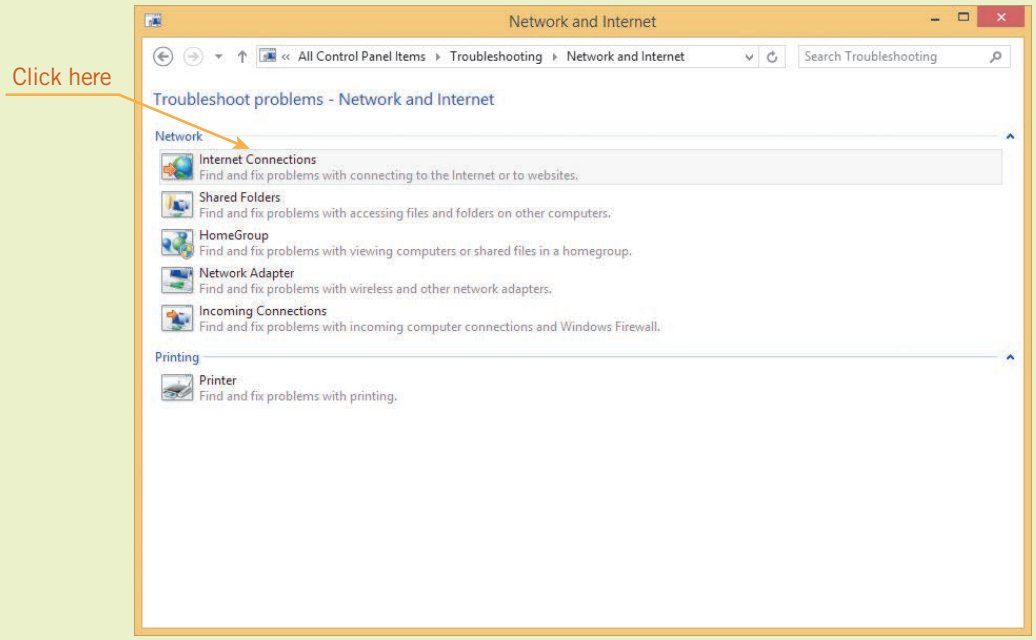
Step-by-Step 28.2

QUICK TIP

If you are using Windows 7 or Vista, click the Start button and then click Control Panel.

1. Open the Start screen. Type **control panel**. The text you entered displays in the *Search* text box. Press **Enter** to open the Control Panel.
2. In the upper-right corner of the screen, the insertion point is positioned in the *Search Control Panel* box. Type **network status**. The screen changes and shows two categories. Under *Network and Sharing Center*, click **View network status and tasks** to display the Network and Sharing Center window.
3. Under *Change your networking settings*, click **Troubleshoot problems** to open the Network and Internet dialog box shown in **Figure 28–5**.

FIGURE 28–5
Network and Internet dialog box



4. Under Network, click **Internet Connections** to open the Internet Connections dialog box. Click the **Next** button to start the troubleshooter. When the Internet Connections dialog box prompts you to select an issue, click the **Troubleshoot my connection to the Internet** link. Windows scans your network devices and software. If it finds a problem, it tries to correct it, and it may prompt you to make decisions.

5. When Windows cannot detect the problem, the response shown in **Figure 28–6** will display. If you see this option on the screen, click **Explore additional options**.

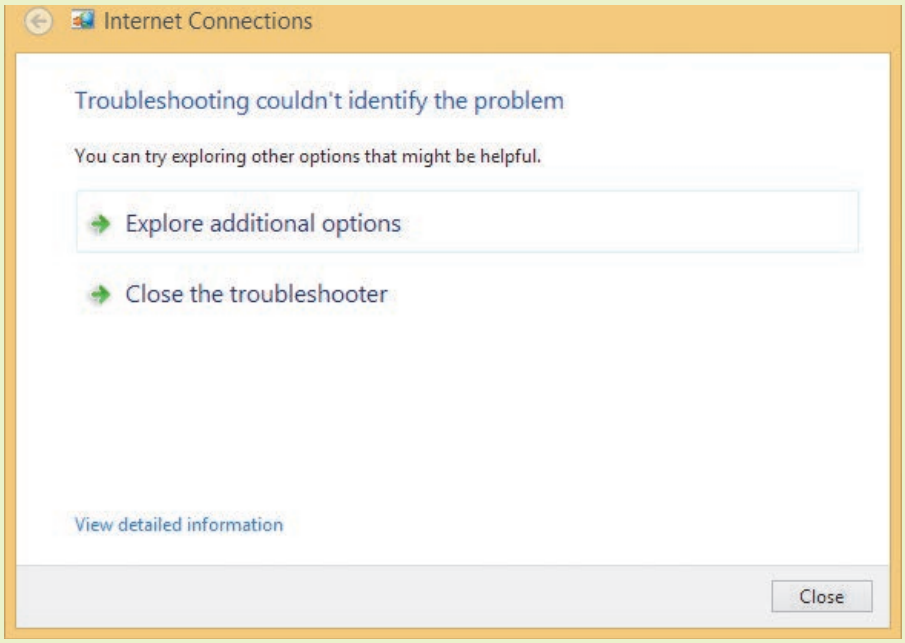


FIGURE 28–6
Troubleshoot wizard response

6. The Additional Information dialog box opens, and Windows provides several links for finding additional information as shown in **Figure 28–7**.

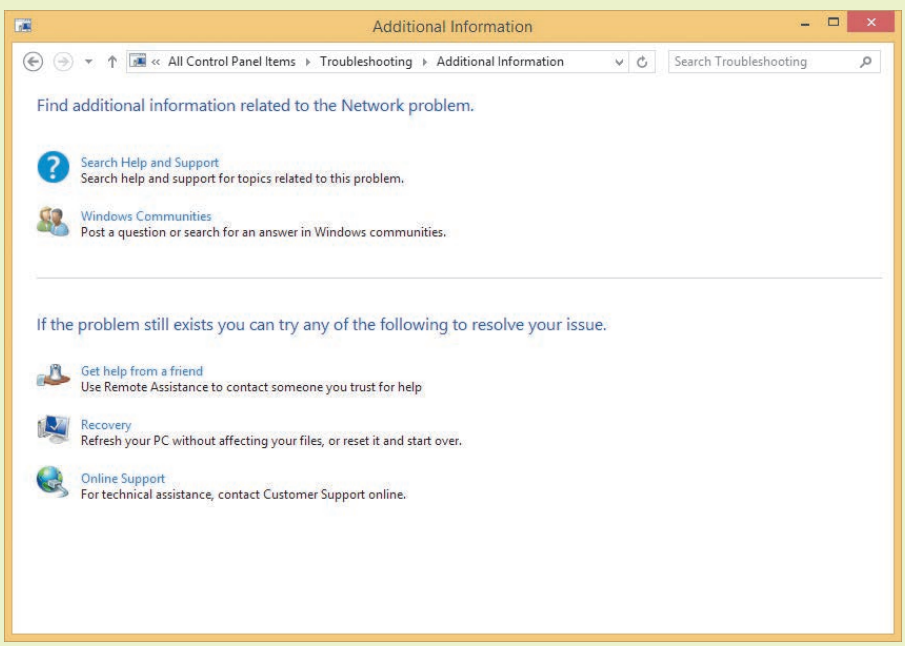


FIGURE 28–7
Additional Information dialog box

7. Close the Additional Information dialog box.

3-1.1.1

Categorizing Web Sites

There is a vast amount of information available on the World Wide Web. Web sites can be organized into categories, each with a different purpose and type of information. The following list provides an overview of some of the types of Web sites available.

- Commercial—Also known as an e-commerce site, a commercial site sells or promotes products or services. Almost every business today has a commercial Web site. Many of these Web sites also provide options to purchase products or services online.
- Academic—Most educational facilities, elementary to university level and public to private, have a Web site. Most higher education Web sites provide online registration, online courses, and other options. Many research facilities and both private and public companies also provide online training for its employees.
- Organizational—Examples include Web sites of nonprofit organizations such as zoos and advocacy groups such as wildlife and clean air supporters.
- Governmental—Most local, state, regional, and national governments have numerous Web sites. For instance, a medium-sized city could have a number of Web sites for employment, news of the day, parks and recreation, local services, utilities, visitor's guide, customer service, and other public announcement sites.
- International—Internet marketing of a product or service sometimes requires that Web sites be hosted in other countries. Each country has unique search engines, which use different mathematical algorithms. Web page text also needs to be translated into the language of the country. Values and customs vary, so an effective Web site in one country may not work in other countries. Finally, local agencies most likely have a better understanding of the population and search engine optimization related to that population.
- Search sites—A search engine is a software program used for online searching. Hundreds of search engines have been developed to find information on the Internet. Each search engine may work a little differently, but most share some common search features. For example, all search engines support keyword searches. More information about using search engines is covered in Lesson 29.
- Membership sites—Some Web sites, such as those used for e-mail services and e-commerce, require you to register before access to the Web site is allowed. Then to access restricted content or use the services, you must enter a user ID and a password. When you see the letter "s" after "http" in the URL, it confirms that it is a secure Web site. You should always verify that the Web address begins with https:// before you enter personal information.
- Online applications—Also known as ***Web apps***, these online applications host programs you can access with your Web browser. When using a Web app, the browser functions as a client. You interact with the software through your browser. Some applications allow you to store data on your local computer while others store your data and information on its servers. The Cloud is a good example. You can create documents online, edit the documents from anywhere, and share your documents in real time for no charge.
- Portal—A ***portal*** is a Web site that features useful content, but it also contains links to other sites. You can use a portal as your home page. For example, MSN.com is a portal that includes links to Web sites for news, sports, entertainment, the Bing search engine, etc.
- Geographic imaging—Mapping and geographic imaging Web sites use technology to change the imagery of the Earth's surface into valuable information. This information is used by geographical information systems (GIS) to capture, store, analyze, and manage images. Google Earth is one example of this type of Web site.
- Wiki—A ***wiki*** is a collaborative Web site that people can use to add, edit, remove, and organize Web page content. Wikipedia is a popular online wiki.

VOCABULARY

Web app

portal

wiki

ABOVE AND BEYOND

Wikipedia is managed by the Wikimedia Foundation, a nonprofit organization that sponsors several other wikis, including Wiktionary, Wikinews, Wikiquote, Wikibooks, Wikidata, Wikispecies, Wikisource, Wikiversity, Commons, WikiVoyage, Mediawiki, and Meta-Wiki.

Navigating the Web

3-1.1.1
3-1.1.3
3-1.2.3
3-1.2.4
3-1.2.5
3-1.2.9

It is important to know how to navigate Web sites so that you can access the information you are seeking both easily and quickly.

The Web is the graphical portion of the Internet. The browser functions as an interface between you and the Internet. To connect to the Internet, the browser sends a message to the Web server to retrieve your requested Web page. The browser then renders the HTML code to display the page. Using a browser, you can display both text and images. Browsers also support multimedia information, including audio and video.

Your browser was installed with a default home page. A ***home page*** is the first page that appears in the browser when you visit a Web site, and it is your opening to the WWW. Because you are familiar with the content and the links on the home page, it can save you time as you begin to navigate Web sites.

Once you open your browser, you can navigate to various Web sites using your browser tools as well as navigation menus and hyperlinks provided on the Web pages. It is easy to identify text hyperlinks because the text is often underlined and formatted in a different color font. Graphics are also used as hyperlinks, and you can easily identify those hyperlinks because when you hover the mouse over the graphic the mouse pointer changes and displays a hand.

Tabs enable you to open multiple Web sites. In Internet Explorer 11, you can open up to 100 tabs in one browsing session. ***Cache memory*** is high-speed RAM (random access memory) that serves as a temporary storage area for data and it is continually updated. When you visit a Web site, a copy of the contents of the Web site is stored in your cache. Instead of downloading the data again, your browser reuses the stored data, which provides a faster loading time and does not increase your data usage.

When you open a Web site in an InPrivate browser tab, the data about your browsing session is not stored in the cache. For example, cookies, temporary Internet files, history, and other data, are not saved. Also, by default, toolbars and extensions are disabled.

This lesson uses Microsoft Internet Explorer 11 as the browser. The basic elements exist in all browsers, and most browsers use universal symbols. **Table 28–2** defines some of the buttons in the browser window.

VOCABULARY

home page

cache memory

TABLE 28–2 Buttons in a Browser Window

COMPONENT	DEFINITION	UNIVERSAL SYMBOLS
Back button	Displays the page you viewed before navigating to the active Web page	
Favorites button	Opens the Favorites, which lists Web pages designated as your favorites	
Forward button	Displays the next page in a series of pages you previously viewed; this button is not active until the Back button has been clicked at least once	
Go button	Opens the Web site for the URL you enter in the Address bar	
Home button	Displays the Web page designated as your home page	
New tab button	Enables you to open an additional Web page in the same browser window without closing the active Web page	
Refresh button	Refreshes or reloads the active Web page	
Page tools button	Displays a menu of often-used commands	

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3-1.1.1
3-1.1.3
3-1.2.3
3-1.2.4
3-1.2.5
3-1.2.9

Navigating Internet Explorer

The following instructions are for navigating Internet Explorer 11 with the Windows 8.1 user interface. Internet Explorer 11 includes many new features for touchscreen users. If you are using a touch screen, you can use gestures such as *press, tap, slide, swipe*, and *drag* instead of following the directions for using the mouse.

You will not be able to complete the following steps if you are using an earlier version of Windows such as Windows 7 or Vista. Go to Step-by-Step 28.4.

Step-by-Step 28.3

1. Open the Start screen. Click the **Internet Explorer** tile. The first page you see is your home page. The URL for the current Web site displays in the Address bar. **Figure 28–8** shows the Address bar and identifies the buttons that display in the Internet Explorer 11 browser window.

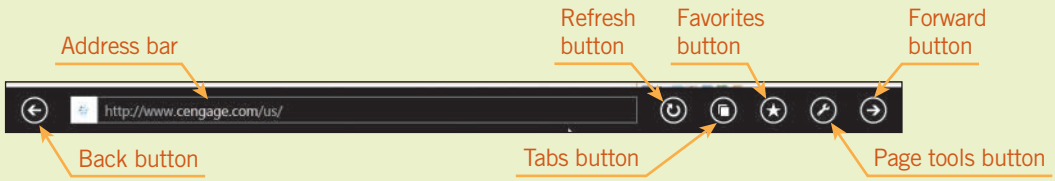


FIGURE 28–8
Address bar in the browser window

2. Click anywhere in the **Address bar**. As shown in **Figure 28–9**, sites previously visited, sites (not including the home page) display above the Address bar. Your screen will differ.

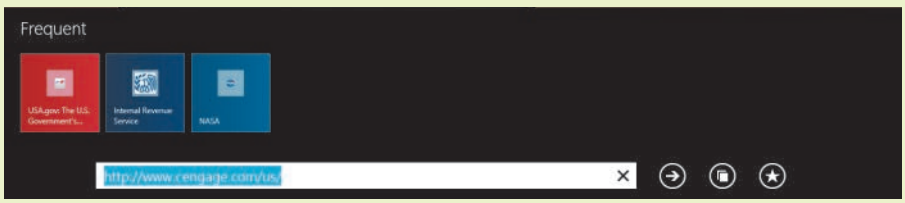


FIGURE 28–9
Previously visited sites

3. The URL in the Address bar is still selected. Type **www.usa.gov** in the Address bar. As you enter the text, hyperlinks for Web sites, apps, and search suggestions display above the Address bar. Continue to type the URL, and when you have entered the entire URL, click the **Go** button (or press **Enter**) to open the USA.gov Web portal.

4. Click the **Address bar**. Type **www.irs.gov** and then click the **Go** button to open the IRS Web site. Hover the mouse over the tabs, text links, and graphics to display hyperlink options on the Web page. For example, the mouse pointer changes to a hand when you position it over a graphic, indicating a text hyperlink to another Web page. Click any one of the hyperlinks to jump to a new Web page. Note that there is still only one tab at the top of the screen; there is only one open Web site.

QUICK TIP

Graphics that include a play button provide a link to a video file. When the graphic (or the play button) is clicked, the linked video usually automatically streams and begins to play.

5. On the left side of the Address bar, click the **Back** button two times. On the right side of the Address bar, click the **Forward** button. The IRS.gov site displays. Click the **Back** button two times. Your home page displays. Because the Web sites were stored in the cache, you were able to quickly reopen them.
6. The Back and Forward buttons also display in the Web page window. As shown in **Figure 28–10**, position the mouse pointer on the right side of the screen to temporarily display the Forward button. When it displays, click the **Forward** button to show the USA.gov window. Then position the mouse pointer on the left side of the screen. When it displays, click the **Back** button to show your home page.

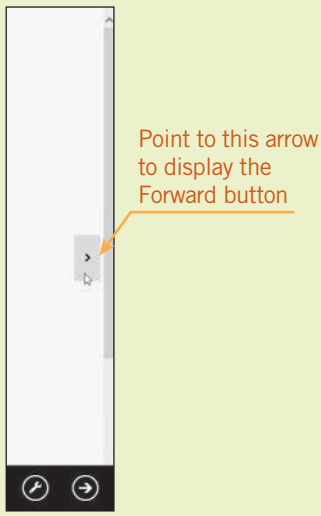


FIGURE 28–10
Forward button in the Web page window

7. Right-click a blank area in the Web page window (do not click a menu tab or a hyperlink). The Tabs bar displays at the bottom of the screen as shown in **Figure 28–11**. The Tabs bar shows sneak peeks of the Web sites that are already open. The Tabs bar in Figure 28–11 shows only one thumbnail.

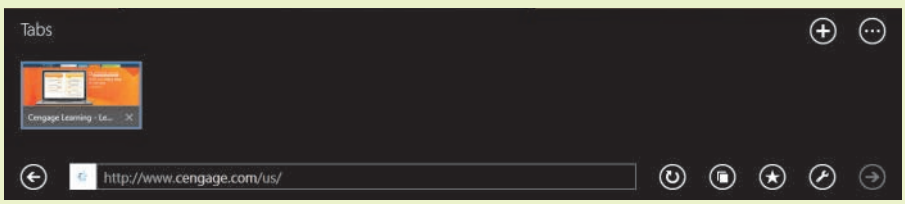


FIGURE 28–11
Tabs bar in the Internet Explorer browser

8. Click a blank area in the window. The Address bar and the Tabs bar are both hidden, and the Web site is displayed full screen. Note that in **Figure 28–12**, sometimes tabs and hyperlinks display at the bottom of the screen. Those tabs are part of the Web site and they are not the same as the Web browser tabs.

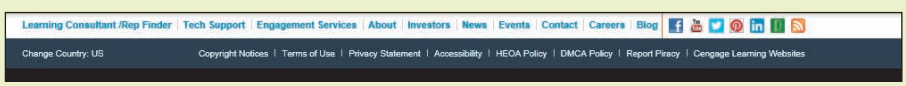


FIGURE 28–12
Tabs and hyperlinks as part of the Web site

QUICK TIP

Internet Explorer 11 in Windows 8 is optimized for touch. Touch Screen users can display and hide the Address bar and the Tabs bar by swiping the Web site borders on the screen. For example, when you swipe down from the top of the window, the Tabs bar displays. When the Tab appears, you can touch the Tabs bar and swipe upward to hide the bar.

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QUICK TIP

You can also show the Address bar by clicking the Address Bar button in the lower-right corner of the window.

QUICK TIP

To keep the Address bar and tabs docked on the bottom of the screen, when Internet Explorer is running, click Settings on the Charms bar and then click Options. Under Appearance, toggle on the option Always show address bar and tabs.

QUICK TIP

To reopen closed tabs, you can use the keyboard shortcut Ctrl+Shift+T.

QUICK TIP

You can also close Internet Explorer and all open pages using the keyboard shortcut Alt+F4.

9. Right-click a blank area in the window. The Address bar and the Tabs bar both display. Note that one thumbnail displays, and it is for the only open page, which is your home page. On the right side of the Tabs bar, click the **New tab** button. The screen changes and shows a new tab screen with a blank Address bar at the bottom of the screen. Thumbnails for frequent Web sites display above the Address bar. To open a new Web site, you can click a thumbnail or enter a URL in the Address bar.
10. The insertion point is already positioned in the Address bar. Type **www.epa.gov** and click the **Go** button. The EPA.gov Web site opens. On the Address bar, click the **Tabs** button to show the Tabs bar. Click the **New tab** button again, type **www.nasa.gov** in the Address bar, and then click the **Go** button. The NASA Web site opens.
11. Click the **Tabs** button to show the *Tabs bar*, which now shows thumbnails for three open Web sites. On the Tabs bar, click the **Tab tools** button and then click **New InPrivate tab**. The new tab screen opens, and the insertion point is positioned in the Address bar, and *InPrivate* displays on the left side of the Address bar. Type **www.cdc.gov** and click the **Go** button to display the CDC Web site. Internet Explorer will not store the browsing information in the cache.
12. Show the *Tabs bar*. Click the **EPA** thumbnail. The screen now displays the EPA.gov Web site in full screen. In the lower-right corner of the EPA thumbnail, click the **Close** button. The EPA.gov window is closed, and the NASA window now displays in full screen, with the Tabs bar still open.
13. Three thumbnails now display on the Tabs bar. Right-click the **NASA.gov** thumbnail. In the shortcut menu, click **Close other tabs** to close all the open tabs, except the NASA.gov tab.
14. Click the **Tab tools** button and then click **Reopen closed tab**. The home tab is restored on the Tabs bar. Click the **Tab tools** button and then click **Reopen closed tab** again. The EPA.gov Web portal tab is restored on the Tabs bar. Tabs closed during the current browsing session are reopened in the order in which they were originally opened. Click the **Tab tools** button again. The *Reopen closed tab* option is dimmed. Because you opened the CDC.gov Web site in an InPrivate tab, the Web site does not reopen.
15. To close Internet Explorer, hover the mouse pointer in a blank area at the top of the screen. When the mouse pointer changes to a hand, click and drag the window all the way to the bottom of the screen. All open tabs are closed, and the Internet Explorer application is closed.

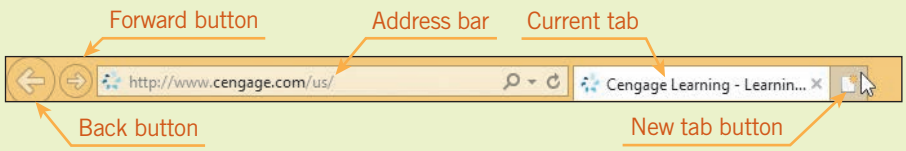
Navigating Internet Explorer in Desktop Mode

Some users prefer to use the Desktop mode in Windows 8. The following steps will help you navigate Internet Explorer 11 using Desktop mode. The following steps are also compatible for earlier versions of Windows.

IC3
3-1.1.1
3-1.1.3
3-1.2.3
3-1.2.4
3-1.2.5
3-1.2.9

Step-by-Step 28.4

1. If you are using Windows 8, open the Start screen and click the **Desktop** tile. On the taskbar, click the **Internet Explorer** button. The first page you see is your home page. The URL for the current Web site displays in the Address bar. **Figure 28–13** shows the Address bar and a tab for the open Web site that display at the top of the screen in Desktop mode. The New tab button displays when you position the mouse pointer over the placeholder for a new tab.



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FIGURE 28–13
Address bar in the browser window in Desktop mode

2. Click anywhere in the **Address bar** to select the URL. Type **www.usa.gov** and watch the screen as you enter the characters. A list of URLs with similar characters displays in a drop-down menu under the Address bar. When you have entered the entire URL, click the **Go** button on the right side of the Address bar (or press **Enter**). The USA.gov Web portal opens and the tab adapts and changes to show the title for the current open Web site.
3. Click the **Address bar**. Type **www.irs.gov** and then click the **Go** button to open the IRS Web site. Hover the mouse over the tabs, text links, and graphics to display hyperlink options on the Web page. For example, the mouse pointer changes to a hand when you position it over a graphic, indicating a text hyperlink to another Web page. Click any one of the hyperlinks to jump to a new Web site. Note that there is still only one tab at the top of the screen; there is only one open Web site.
4. On the left side of the Address bar, click the **Back** button two times. On the left side of the Address bar, click the **Forward** button. The IRS.gov site displays. Click the **Back** button two times. Your home page displays. Because the Web sites were stored in the cache, you were able to quickly reopen them.

QUICK TIP

Sometimes new tabs display at the top or bottom of the screen, and even on the sides of the window pane. Those tabs are part of the Web page and they are not the same as the Web browser tabs.

5. On the right side of the tab for the open Web site, point to the placeholder for a new tab, and then click the **New tab** button. A new window opens and displays thumbnails for frequently visited Web sites. You can click a thumbnail, or you can enter a new URL in the Address bar at the top of the window.
6. The insertion point is already positioned in the Address bar. Type **www.epa.gov** and click the **Go** button. The EPA.gov Web site opens in a new tab. Click the **New tab** button again, type **www.nasa.gov** in the Address bar, and then click the **Go** button. The NASA Web site opens in a new tab.
7. At the top of the screen, a tab displays for each of the three open Web pages. Click the **EPA** tab. The screen now displays the EPA.gov Web page in full screen. Point to the *Internet Explorer* button on the taskbar. A thumbnail displays for each of the open Web sites. Click the **NASA** thumbnail to display that Web site.
8. Right-click the **Internet Explorer** button on the taskbar. A shortcut menu similar to the one shown in **Figure 28–14** opens, and you can choose from several options to open recently accessed Web sites or to create new tabs. Click outside the shortcut menu to close it.

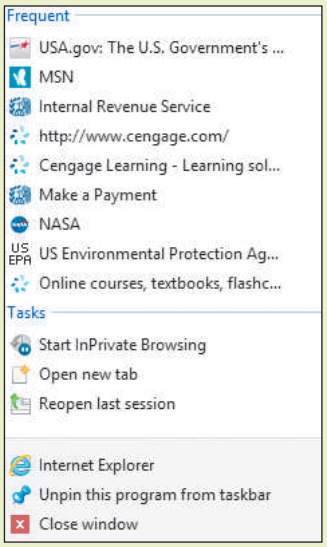


FIGURE 28–14
Internet Explorer shortcut menu

9. In the upper-right corner of the screen, click the **Tools** button, point to *Safety*, and then in the submenu, click **InPrivate Browsing**. A screen similar to the one shown in **Figure 28–15** opens and provides information about InPrivate browsing. The URL in the Address bar is selected, and *InPrivate* displays on the left side of the Address bar.

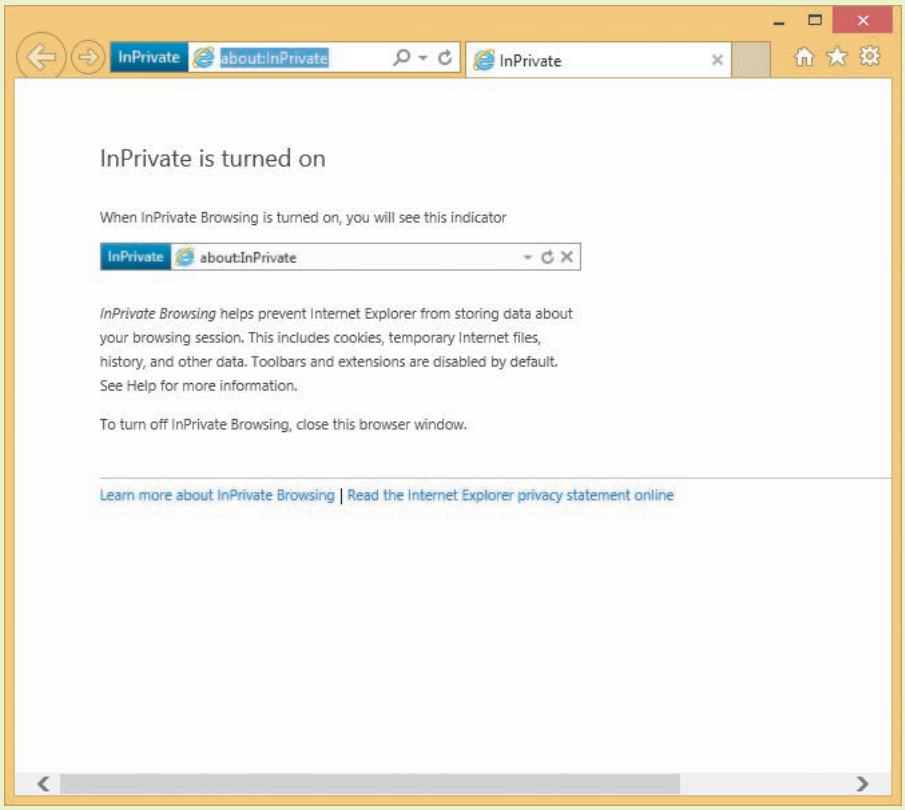


FIGURE 28–15
InPrivate browsing information

10. Type **www.cdc.gov** and click the **Go** button. The CDC Web site opens in a new browser window. The window only displays the tabs for Web sites that were opened using the InPrivate browsing setting, so tabs for the other Web sites that are open do not appear at the top of this window. Click the **New tab** button, type **www.irs.gov**, and then click the **Go** button. Two tabs now display at the top of the screen.
11. Point to the *Internet Explorer* button. Five thumbnails display, including the CDC and IRS Web sites which were opened using the InPrivate browsing setting. Click the **CDC** thumbnail. On the *IRS* tab at the top of the screen, click the **Close** button. The IRS.gov window is closed. In the upper-right corner of the screen, click the **Close** button to close the CDC Web site and the InPrivate browsing window. The other browsing window remains open.
12. Right-click the **NASA.gov** tab. In the shortcut menu, click **Close other tabs** to close all the open tabs in the browsing session, except the NASA.gov tab.
13. Right-click the **NASA.gov** tab. In the shortcut menu, point to *Recently closed tabs*. The Web sites you closed appear in a list. Because you opened the CDC and IRS Web sites in the InPrivate browser, the CDC and the IRS Web sites do not appear in the list. Note that with a single click you can reopen all the Web sites in the list.

14. In the shortcut menu, click **Reopen closed tab**. The EPA Web portal tab is restored on the Tabs bar. Right-click the **NASA.gov** tab again and then click **Reopen closed tab** again. The home tab is restored on the Tabs bar. Right-click the **NASA.gov** tab. Note that the *Reopen closed tab* option is dimmed. Because you opened the CDC.gov and IRS Web sites in the InPrivate browser, the Web site does not reopen.
15. To close Internet Explorer, click the **Close** button in the upper-right corner of the screen. When prompted to choose which tabs to close, click the **Close all tabs** button. All open tabs are closed, and the browser window is closed.

3-1.1.1
3-1.1.3
3-1.2.4

Customizing Web Browser Settings

To go straight to the site you visit the most, you can reset the home page to a Web site of your choice. Because you are familiar with the content and the links on the home page, it can save you time as you begin to navigate Web sites. You can change your home page at any time.

When you are navigating a Web site with multiple pages, instead of clicking the Next button to advance to the next portion of the Web page, you can switch to reading view and flip through the Web page content without any advertisements, like you are reading a book. You can customize the background style and the font style and size in the reading view settings.

The reading view option is only available in the Windows 8.1 user interface, and it is turned on by default. The reading view feature is not supported in Internet Explorer 11 on Windows 7 or Internet Explorer for the desktop on Windows 8.1.

If you access a Web page that provides information that is regularly updated, such as sport scores, most likely you will need to refresh or reload the information.

Step-by-Step 28.5

QUICK TIP

You can also customize browser settings for opening Internet Explorer in the desktop, but the available options for Desktop mode differ. To switch to Desktop mode after opening Internet Explorer in Windows 8, in the lower-right corner of the screen, click the Page tools button and then click View in the desktop. In the upper-right corner of the screen, click the Tools button and then click Internet options.

1. Open the Start screen and then click the **Internet Explorer** tile.
2. Display the Charms bar (*Hint*: Press Windows + C). Click the **Settings** button and then at the top of the Settings pane, click **Options**. The Options pane shown in **Figure 28–16** opens.

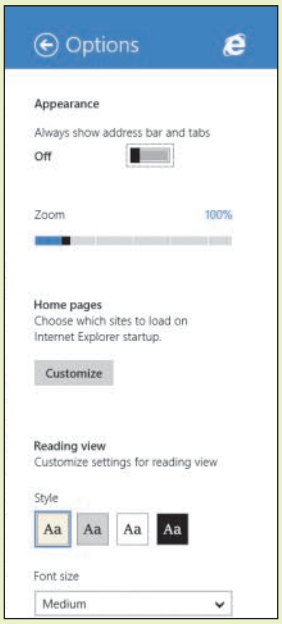


FIGURE 28–16
Options pane

3. Under the *Home pages* category, click the **Customize** button. The Home pages pane opens. At this point you would click the URL and enter a new URL or you would click the Add current site button. Do not make any changes.
4. At the top of the pane, click the **Back** button to return to the Options pane. If necessary, scroll down to show the *Reading view* category shown in Figure 28–16. Note that several options for background and font styles are provided to change the appearance of the screen when you switch to reading view. Do not make any changes.
5. Continue to scroll down through the list to view the other categories for customizing the browser. To close the Options pane, click in a blank area in the Web page window (do not click a graphic or a link).
6. Click in the **Address bar**, type **www.nps.gov**, and then click the **Go** button. If necessary click a tab to navigate to news articles on the Web site. Click a link to any news article or story and wait a moment for the Switch to reading view button to display on the right side of the Address bar. If necessary, continue to click other links for news articles and stories until you see the Switch to reading view button on the Address bar.
7. Click the **Switch to reading view** button to toggle on the reading view feature. You can use the touchscreen, the mouse wheel, or the horizontal scroll bar to navigate through the article.
8. If necessary, right-click in a blank area in the Web site window to display the Address bar. Click the **Switch to reading view** button to toggle off the reading view feature.
9. Leave Internet Explorer open for the next Step-by-Step.

QUICK TIP

To change the default home page in Desktop mode, visit the Web page you want to use as your home page. Click Tools on the Internet Explorer menu bar and then click Internet options. On the General tab of the Internet Options dialog box, under Home page, click the Use current button.

3-1.1.1
3-1.1.3
3-1.2.6

Managing Plug-Ins

Browser plug-ins (also referred to as add-ons) are optional software apps that add functionality to a Web browser. The plug-ins enable you to watch movies, listen to music, play online games, open and read documents, and so forth. Common examples of plug-ins include Adobe Acrobat Reader, Java Virtual Machine, Adobe Flash Player, Apple QuickTime, and Windows Media Player.

If you're unable to play a video, you should check to make sure the plug-in is installed and enabled. You can view the plug-ins that are installed. You can also disable any of the plug-ins installed. To remove a plug-in completely, you must uninstall the software. If you need a new plug-in, you can search the Web for the plug-in and install it.

To manage add-ons, you need to open Internet Explorer in Desktop mode.

VOCABULARY
browser plug-in

Step-by-Step 28.6

1. If necessary, open Internet Explorer. In the lower-right corner of the screen, click the **Page tools** button and then click **View in the desktop**.
2. In the upper-right corner of the screen, click the **Tools** button, and then click **Manage add-ons**. The Manage Add-ons dialog box opens.
3. If necessary, under *Add-on Types*, select **Toolbars and Extensions**. The installed add-ons are listed in the pane on the right.
4. Note that by default many add-ons are hidden. In the lower-left corner under *Show*, click **Currently loaded add-ons** and then click **All add-ons** to view them all. Compare your screen to **Figure 28–17**. Your add-on information will most likely differ.

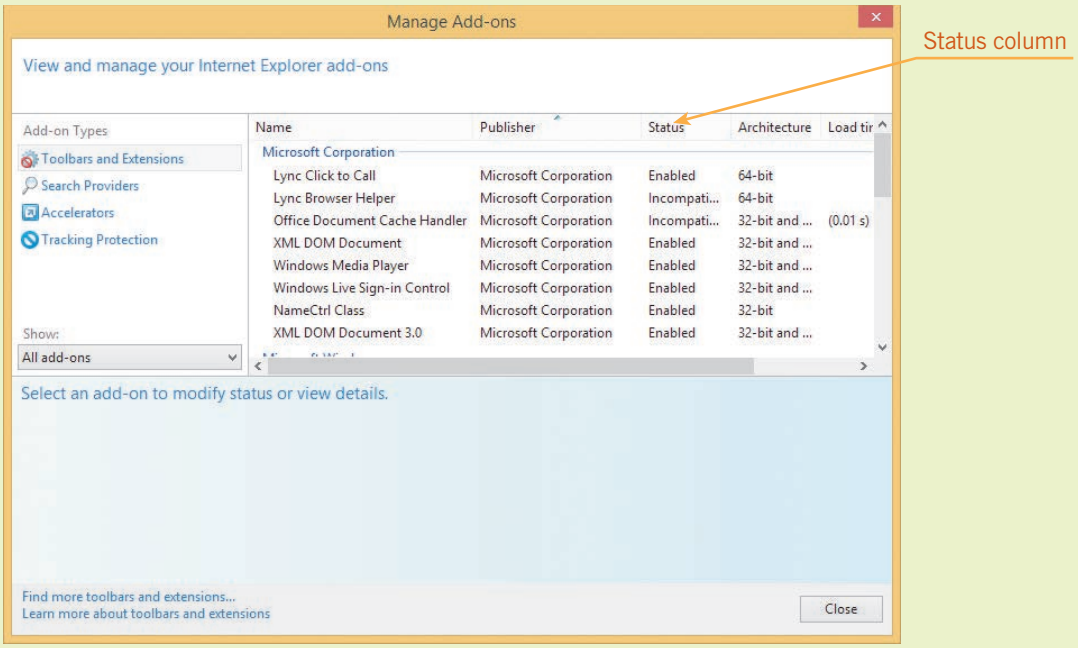


FIGURE 28–17
Manage Add-ons dialog box

5. Select the first add-on listed in the right pane with *Enabled* in the Status column. Information about the add-on displays at the bottom of the dialog box. In the lower-right corner of the dialog box, click the **Disable** button. Also note that the status changes in the *Status* column.
6. The add-on should still be selected in the list. In the lower-right corner of the dialog box, click the **Enable** button.
7. In the left pane, under *Add-on Types*, click **Search Providers**. By default, the search engine Bing is installed with Windows 8. In the right pane, click **Bing**. Note that the options in the dialog box change. As shown in **Figure 28–18**, you can configure the add-on to meet your needs. Note that when the option is enabled, you can use the Address bar to search for key words.

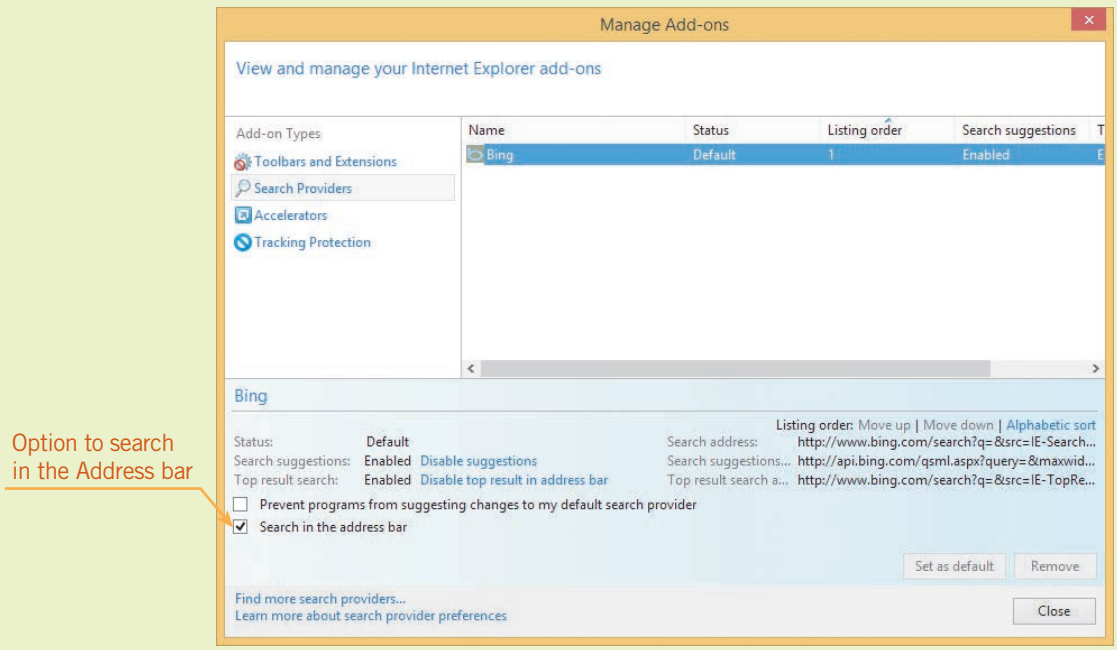


FIGURE 28–18 Search provider options

8. In the left pane, click **Accelerators** and then select the first accelerator in the list. If the add-on can be deleted, the Remove option will display. Do not make any changes.
9. Close the Manage Add-ons dialog box. Close Internet Explorer.

3-1.1.1
3-1.1.3
3-1.2.7

Managing Browsing History

Your browser tracks the sites you have visited for a specified period of time. Browsing history includes URLs for the Web sites you've visited and cached text of pages you've accessed. It also includes passwords and information that you've entered into online forms. Browsing history saves you time when you want to revisit a Web site because you don't have to enter the URL or search for the Web site. However, if you share a computer, you may want to erase your browsing history. The default setting in Internet Explorer is to keep the browsing history for 20 days, but you can manually delete the history at any time.

Step-by-Step 28.7

1. If necessary, open the Start screen and click the **Internet Explorer** tile. Click the **Address bar**. A history of your browsing displays in the Frequent thumbnails that display above the Address bar. Click one of the thumbnails to revisit that Web site.
2. Click the **Address bar**. Right-click the **IRS** thumbnail. In the shortcut menu, click **Remove**. The Web site is removed from the browsing history.
3. Display the Charms bar. Click the **Settings** button and then at the top of the Settings pane, click **Options** to show the Options pane. Scroll down to the *History* category shown in **Figure 28–19**. Note that there are options for managing passwords, phone numbers, and fonts and encoding on Web pages.

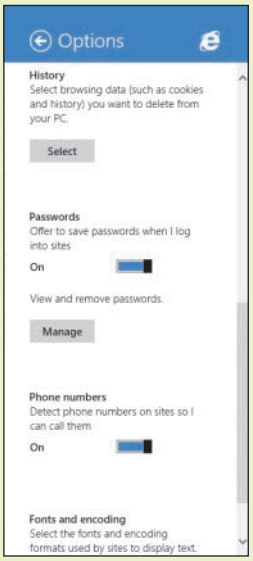


FIGURE 28–19
History options in the Options pane

4. Under *History*, click **Select**. The options shown in **Figure 28–20** display. Note that you can choose what information you want to remove from the browser history. Do not delete any browsing history. Click the **Back** button to return to the Options pane.

QUICK TIP

To delete the browsing history in Desktop mode, click the Tools button, click Safety, and then click Delete browsing history. You can choose what data to delete in the Delete Browsing History dialog box.

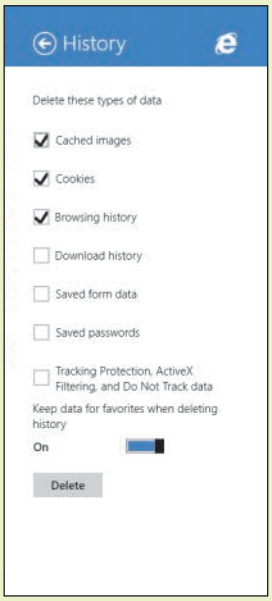


FIGURE 28–20
Options in the History pane

5. Scroll down the pane, and under the *Password* category, click **Manage**. If the password option to offer to save passwords when logging in is turned on, a list of accounts for which you have entered sign-in information displays in the Accounts pane. You can click to select an account and then you can choose to remove the account information that is saved in the browsing history. Do not make any changes.
6. Click anywhere in a blank area in the Web site window to close the Accounts pane.
7. Leave Internet Explorer open for the next Step-by-Step.

Organizing Favorites and Refreshing Web Sites

IC3
3-1.2.4
3-1.2.5

Internet Explorer and other browsers provide a tool that makes it easy for you to return to a particular Web site or to easily access a Web site that you visit frequently. Internet Explorer refers to these links as favorites. Other browsers refer to these as bookmarks.

When you add a Web site as a favorite or bookmarked site to the Favorites bar, you can create a new folder to organize favorites. You can save the Web site URL in multiple folders. You can organize the favorites in alphabetical order using features in the Desktop.

Some Web sites provide information that is regularly updated, such as weather forecasts, news updates, and sport scores. When you leave the Web site open for a period of time, you will want to refresh (reload) the Web site to update the information.

If you don't have time to explore and read the information on a Web site, you can add the URL to a reading list so you can return to the Web site later.

Step-by-Step 28.8

1. If necessary, open the Start screen and click the **Internet Explorer** tile. Click the **Address bar**, type **www.weather.gov**, and then click the **Go** button. Using the links on the page, navigate to a radar map. Note that a caption displays a time stamp for when the map was last updated.
2. On the right side of the Address bar, click the **Favorites** button to display the Favorites bar, which shows folders and thumbnails for favorite Web sites, as shown in **Figure 28–21**. Your thumbnails will differ from those shown in the figure.

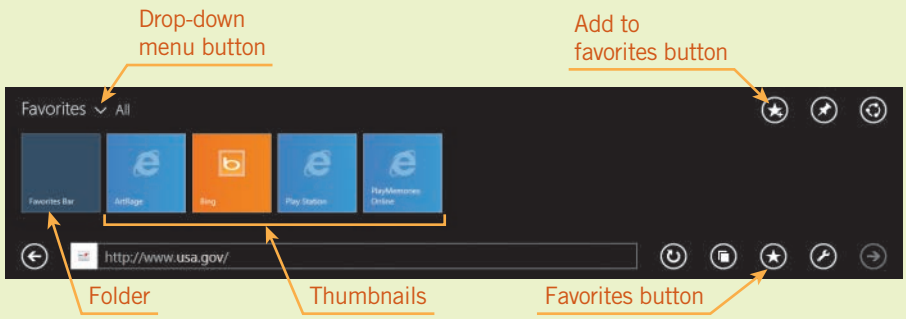


FIGURE 28–21
Favorites bar

3. Click the **Drop-down menu** arrow. There are at least two folders labeled *All* and *Favorites Bar*. Your menu may show other folders. Click **All**. All the folders and thumbnails for favorites display on the Favorites bar. Some of the favorites may have been added during the software installation. Click the **Favorites Bar** folder. You will most likely see fewer or even no thumbnails because only favorite Web sites you saved in this folder will display.
4. In the upper-right corner of the Favorites bar, click the **Add to favorites** button. The Add to favorites dialog box shown in **Figure 28–22** opens above the Favorites bar. The name for the current Web page displays in the *Name* text box. If desired, you can change the name, but do not make any changes now.

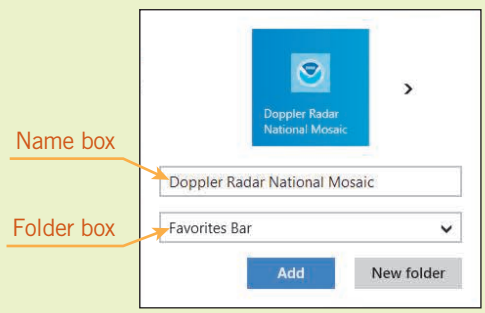


FIGURE 28–22
Add to favorites dialog box

5. The second text box displays the folder name *Favorites Bar*. Click the **list arrow**. Note that you can choose *All* or *Favorites Bar*. You may also see more folders on your menu. Click **Favorites Bar**.

6. Click the **New folder** button. The insertion point is positioned in a *New folder* text box. Type **Weather** and then click the **Create** button. A new folder has been created and the new folder name displays in the Folder text box. The Weather folder displays on the Favorites bar. Click the **Add** button to save the URL as a favorite in the new folder. A new thumbnail for the weather link displays in the Favorites bar. Note that the folder path at the top of the bar now shows *Favorites Bar* | *Weather*, the path for the current folder.
7. On the Favorites bar, click the **Drop-down menu** button. As shown in **Figure 28–23**, the new Weather folder appears as a subfolder in the Favorites Bar folder. In the menu, click **Favorites Bar**. The Weather folder displays on the Favorites bar. Note that the header on the Favorites bar now shows *All* | *Favorites Bar*. Also note that the URL for the weather site still displays in the Address bar.

QUICK TIP

You can also add a tile to the Start screen to quickly connect you to a favorite Web page.

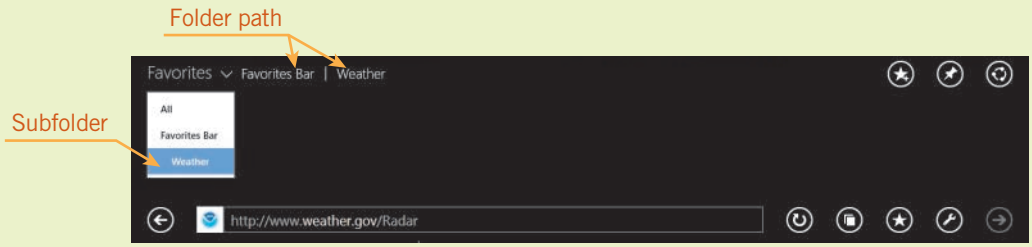


FIGURE 28–23
Favorites Drop-down menu

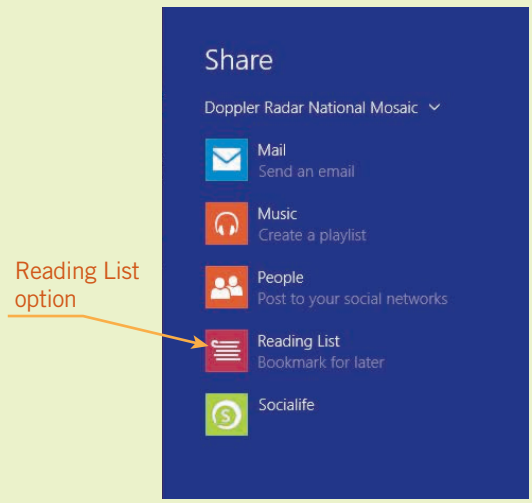
8. Click the **Add to favorites** button. In the *Folder* text box, *Favorites Bar* already displays. Click **Add** to save the URL to the Favorites Bar folder. The favorite Web site is now saved in two folders. Note that the Weather.gov thumbnail displays next to the Weather folder in the Favorites Bar folder on the Favorites bar.
9. Click the **Drop-down menu arrow** and then click **Weather**. The Favorites bar now shows the contents in the Weather folder. Right-click the **Weather.gov** thumbnail and then in the shortcut menu, click **Remove**. The folder is now empty. In the folder path that displays at the top of the Favorites bar, click **Favorites Bar**. The Weather folder and the Weather.gov thumbnail both display on the Favorites bar. Right-click the **Weather** folder and then in the shortcut menu, click **Remove**. When prompted to delete the folder, click **Delete**. The Weather folder is deleted.
10. Click in the Web window to close the Address bar and the Favorites bar. Note the time stamp for the weather map. Re-open the **Address bar**. Then click the **Refresh** button to make sure the most recent version of the page is loaded. Check to see if the time stamp on the map changed.

QUICK TIP

To organize favorites in folders in Desktop mode, click the Favorites button. To move saved favorites, drag and drop the saved favorites into the folder. To manage folders, click the Add to favorites list arrow and then click Organize favorites. In the Organize Favorites dialog box, you can choose commands to create, rename, move, and delete folders.

11. Click the **Page tools** button and then click **View in the desktop**. In the upper-left corner of the screen, click the **Favorites** button. If necessary, click the **Favorites** tab. At the top of the Favorites menu, right-click the first folder to show the shortcut menu. To organize the favorites alphabetically, you would click the *Sort by name* option. Do not make any changes. In the upper-right corner of the screen, click the **Close** button to close the tab and Internet Explorer.
12. Click the **Start** button to open the Start screen, and then click the **Internet Explorer** tile. The Weather.gov Web site should open. Click the **Favorites** button. On the right side of the Address bar, click the **Share** button. The Share pane shown in **Figure 28–24** provides several options for sharing the Web site's URL. The arrangement of the options may differ on your screen.

FIGURE 28–24
Share pane



13. Click the **Reading List** option to bookmark the URL. The Reading List pane opens and shows a link for the current URL and a time stamp. Click the **Add** button. The link to your content is now stored in the Reading List, and the pane closes.
14. Click the **Start** button and type **reading list**. Click the **Reading List** tile (or press **Enter**).The Reading List screen opens and a link to the Weather.gov link displays. Right-click the **Weather.gov** link. In the lower-left corner of the screen, click **Delete** to remove the bookmark from the list.
15. Point to the top of the screen. When the pointer changes to hand symbol, click and drag the window to the bottom of the screen (or press **ALT**+**F4**) to close the Reading List screen.

Addressing Web Site Issues

3-1.1.1
3-1.1.3
3-2.1.3
3-2.1.4

The Internet and browsers are not without their problems. Web sites might not be displayed for a number of reasons.

When you enter a Web site address and receive a "Page not found" message, the Web site might display a "404 error," which you receive because a) the page was moved, b) an old index is still maintained in a search engine, or c) you made a typing error when entering the Web site address. In some instances, the Web site is temporarily unavailable because the server is offline or the site is being updated.

A Web page may load slowly because of heavy server traffic or because the page may contain a large number of images. A garbled or offset page could result from a number of issues, such as the rendering technique used by the browser. If you are using a recent browser, such as Internet Explorer 11, you can use the Compatibility View command to try to display the Web page using older settings.

Pop-up ads can also be an annoyance. Advertisers place these ads on Web sites and they pop up in the middle of a page to call attention to its content. Internet Explorer contains a pop-up blocker that limits most pop-ups. By default, the pop-up blocker is enabled. You can customize the settings to allow pop-ups from specific Web sites.

Internet security is essential. Each time you connect to the Internet, there is the risk of unauthorized parties accessing sensitive resources. And, you are vulnerable to viruses and other malicious code. If a wireless connection is not protected by a password, anyone with a wireless router and within the range of the signal can use the connection to browse the Internet. However, you might be sharing much more than the Internet access. Once they access your wireless connection, they can also access your data. Encryption methods used by routers protect against unauthorized access. Older devices might be programmed to connect using WEP (Wired Equivalent Privacy Protocol), but newer devices are likely programmed to use WPA (Wi-Fi Protected Access) or WPA-2, which are improved encryption methods.

Other forms of security management are gateways and firewalls. A ***gateway*** is a computer or dedicated hardware device that connects a LAN (Local Area Network) to another network, typically the Internet, or a WAN (Wide Area Network). A ***firewall*** blocks unauthorized network access either within its own LAN or to and from the WAN. Network administrators and information security experts configure the firewall to ensure that only authorized protocols, applications, users, etc. are allowed access to critical data within the network. Antivirus apps help protect against viruses, and antimalware apps help protect against malware. All of these functions need to work together for optimal performance and security.

VOCABULARY

gateway

firewall

Some antivirus software programs include firewall protection. You need only one firewall app running on your PC. Windows Firewall comes with Windows, and it is turned on by default. You should not turn Windows Firewall off unless you have another firewall turned on.

To customize the settings for compatibility viewing, blocking pop-ups, and turning on the firewall, you must switch to Desktop mode.

Step-by-Step 28.9

1. Open the Start screen and click the **Internet Explorer** tile. On the right side of the Address bar, click the **Page tools** button and then click **View in the desktop**.
2. To enable compatibility view settings for a Web site:
   a. In the upper-right corner of the screen, click the **Tools** button.
   b. In the drop-down menu, click **Compatibility View settings** to open the Compatibility View Settings dialog box shown in **Figure 28–25**. You can click Add to add the current Web site.

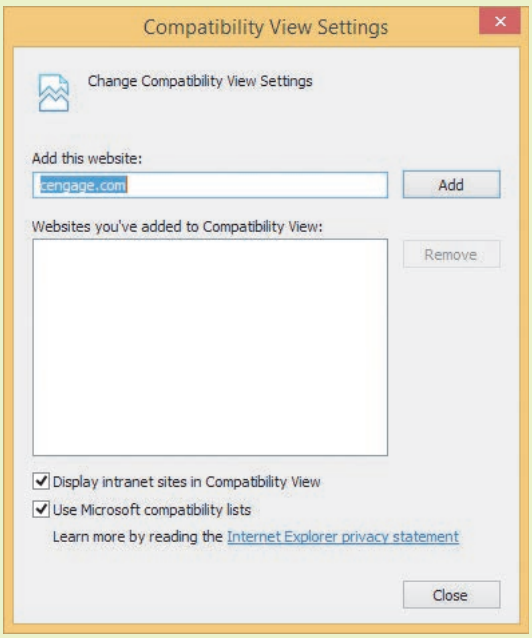


FIGURE 28–25
Compatibility View Settings dialog box

   c. Do not make any changes. Close the dialog box without making any changes.
3. To block pop-up ads:
   a. Click the **Tools** button and then click **Internet options**. The Internet Options dialog box opens. Click the **Privacy** tab to show the setting options shown in **Figure 28–26**.

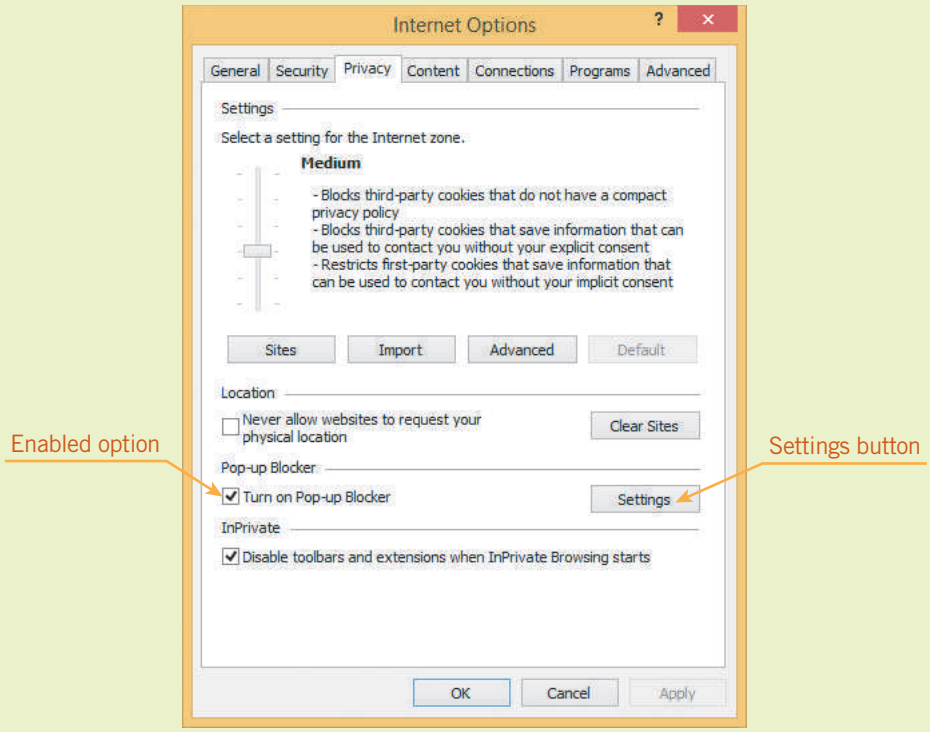


FIGURE 28–26
Privacy tab in the Internet Options dialog box

b. If necessary, in the *Pop-up Blocker* category, enable the **Turn on Pop-up Blocker** option. Then click the **Settings** button. The Pop-up Blocker Settings dialog box shown in **Figure 28–27** opens. If desired, you can enter addresses to allow pop-ups from specific Web sites.

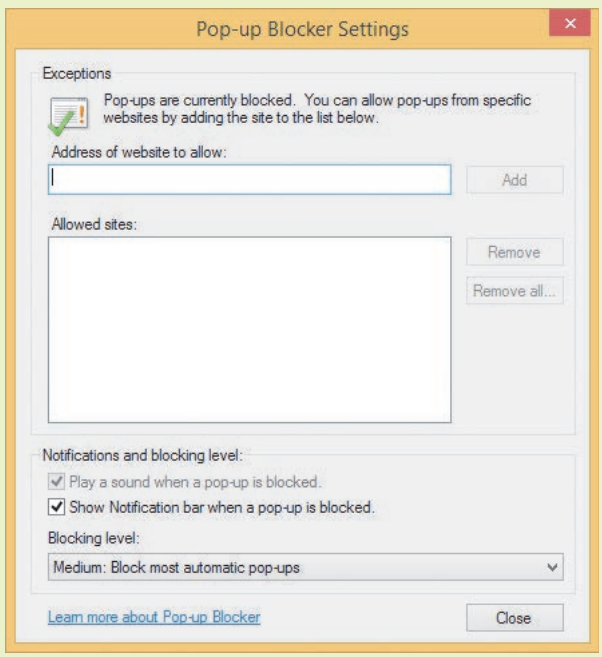


FIGURE 28–27
Pop-up Blocker Settings dialog box

c. Do not make any changes. Close the Pop-up Blocker Settings dialog box. Then click **Cancel** to close the Internet Options dialog box, and then close Internet Explorer.

4. To confirm the firewall settings:
   a. Click the **Start** button to open the Start screen. Type **control panel**, and then click the **Control Panel** tile.
   b. The insertion point is positioned in the Control Panel search box in the upper-right corner of the screen. Type **firewall**. The screen changes and displays the firewall – Control Panel dialog box.
   c. Click the first link, **Windows Firewall**. The Windows Firewall dialog box opens, similar to the one shown in **Figure 28–28**. The current status of firewall settings displays in the middle of the screen.

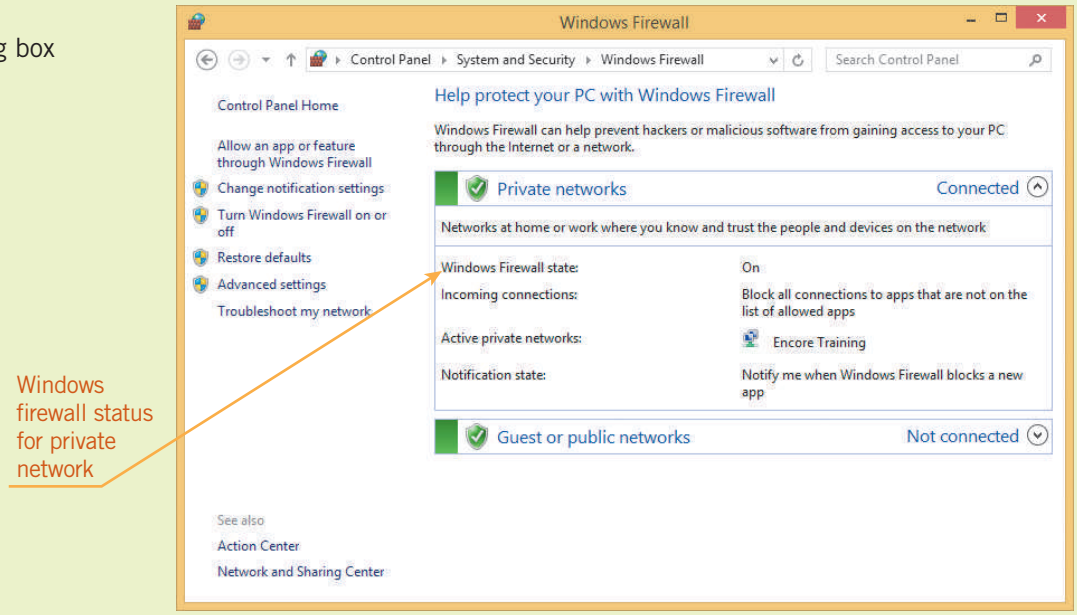


FIGURE 28–28
Windows Firewall dialog box

d. On the left side of the screen, click the link **Turn Windows Firewall on or off**. The Customize Settings dialog box shown in **Figure 28–29** opens. In this dialog box, you can turn the firewall on or off, and you can choose to block all inbound connections except those that you specifically allowed. Click **Cancel** to close the dialog box without making any changes. Then close the Windows Firewall dialog box.

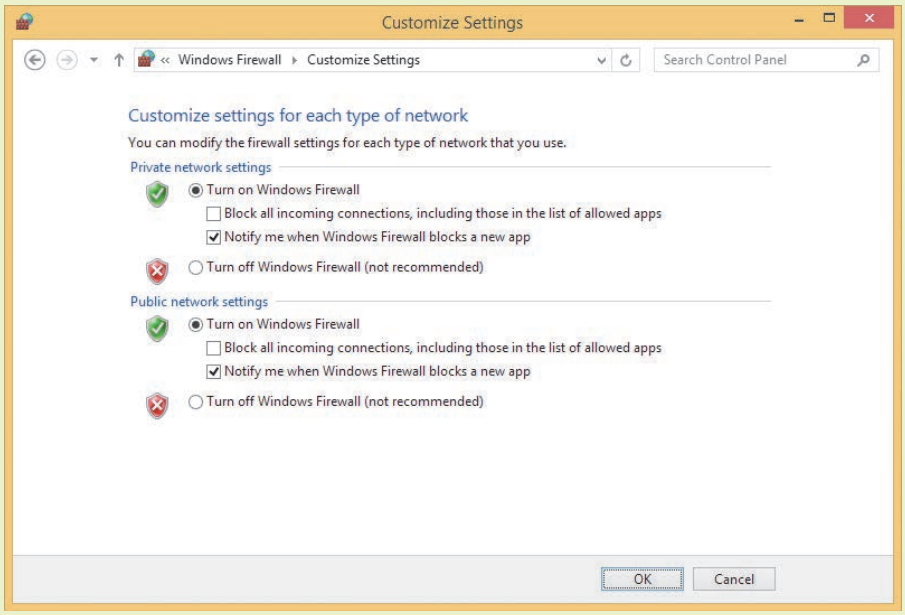


FIGURE 28–29
Customize Settings dialog box

WORKPLACE READINESS

Digital Literacy

To succeed in today's workplace, you need digital literacy—the ability to find, organize, understand, and analyze information using digital technology, including computing devices and the Internet. If you have digital literacy, you can communicate, collaborate, and work effectively using online tools.

Many jobs require that you have at least a basic knowledge of computers and the Internet; whereas, some careers demand more advanced knowledge or mastery. Digitally literate employees are proficient at using a variety of computing devices including portable devices, conducting and analyzing online searches, and using online collaboration tools.

SUMMARY

In this lesson, you learned:

- The Internet, the World Wide Web, and Web browsers have their own terminology.
- There are several methods for connecting to the Internet, and different types of Internet connections provide a range of options.
- Almost every time you access the Internet, you are using data. The data is transmitted in packets, and the size of the packet is defined in bits and bytes.
- Web sites can be organized into categories, each with a different purpose and type of information.
- Once you connect to the Internet, you need a Web browser to display Web pages. Basic elements exist in all browsers, and most browsers use universal symbols.
- You can customize the browser so you can access the information you are seeking both easily and quickly.
- A browser tracks Web sites you have visited and temporarily stores data you access on the Web.
- Browsers provide features that enable you to easily access recently visited and frequently visited Web sites.
- Internet security is essential. Each time you connect to the Internet, there is the risk of unauthorized parties accessing sensitive resources.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. All domain names end with a two- or three-letter extension.

T F 2. Browser plug-ins are required.

T F 3. Almost every time you access the Internet, you will download or upload data.

T F 4. You can customize the settings to allow pop-ups from specific Web sites.

T F 5. To display Web pages, you must have a Web browser installed.

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided:

1. A(n) _____ is the first page that appears in the browser when you visit a Web site.
2. The _____ in the browser window displays the URL of the current page.
3. _____ is the main markup language used to create Web pages.
4. A(n) _____ provides Wi-Fi network access (usually Internet access) to a small area for wireless-enabled devices such as laptops, tablets, and smart phones.
5. A(n) _____ is a software application you use to view and retrieve documents from the Web and to display the documents in a readable format.
6. A(n) _____ is an organization or company that provides connectivity to the Internet through a telecommunications line or wireless system.
7. _____ is high-speed RAM (random access memory) that serves as a temporary storage area for data and it is continually updated.
8. A(n) _____ is a Web site that features useful content, but it also contains links to other sites.
9. Web sites for various branches of the Armed Forces of the United States use the domain extension _____.
10. The _____ ensures that only authorized protocols, applications, users, etc. are allowed access to critical data within a network.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What is the purpose of the extension for a Web site domain name?

2. When choosing an Internet connection type, what factors should you consider?

3. What is the benefit of streaming data?

4. Since bits and bytes both start with the letter B, how can you distinguish bits and bytes in acronyms?

5. What type of data is stored in browsing history?

6. Why would you want to set a home page for your browser?

7. What is the purpose of the Refresh feature in a Web browser?

8. What domain type is associated with commercial/business Web sites?

9. What functions do plug-ins add to a Web browser?

10. What is the purpose of a wiki Web site?

PROJECTS

PROJECT 28–1

3-1.2.4

1. Open a Web site that provides current data, such as a sports game, weather forecasts, online bidding etc.
2. Make note of the current status on the Web page, such as the game score.
3. Leave the Web site open as you work through all of the projects.

PROJECT 28–2

3-1.1.1
3-1.1.2
3-1.1.3
3-1.2.1
3-1.2.3

1. Go to your home page.
2. Click a link on your home page to navigate to a new Web page. Continue to click links so that you can open a story or an article.
3. Identify the following parts in the URL that display in the Address bar:
   - protocol
   - domain name
   - domain type
   - site map
   - file type
4. Create a list of the URL parts, and to the right of each list, write the portion of the URL that applies to that part name.
5. Submit the list to your instructor as requested.
6. Leave your browser open for the next project.

PROJECT 28–3

3-1.2.6

1. Open your browser application.
2. Navigate to the Manage Add-ons dialog box.
3. Identify at least three plug-ins that you use in your browser window.
4. Submit the list to your instructor as requested.

PROJECT 28–4

3-1.2.4

1. Navigate to the Web site you opened in Project 28–1.
2. Note the status on the Web page, such as the sport score or the time stamp on a bid.
3. Refresh the page to see if the Web page was updated during the time period.

TEAMWORK PROJECT

This lesson describes several new features for the Internet Explorer 11 Web browser. As noted in the lesson, there are several browsers available. Find a classmate, friend, or family member who uses a browser other than Internet Explorer 11. Using your computers or devices side-by-side, follow these steps.

1. Open the Web site www.nps.gov.
2. Compare the following features. As you compare each feature, rate that feature by using a ranking scale of 1 to 5 (1 means you would probably never use this feature and 5 means that you would definitely use the feature).
   - Placement of elements on the Web page, such as the position of the address bar and the browser tabs.
   - Display options, such as full screen view and reading view.
   - Navigation features, such as moving back and forward, flipping through pages, and opening new tabs.
   - Access to browsing history.
   - Creating and navigating to favorites/bookmarks.
3. Prepare a summary that explains your rankings and why you ranked each feature as you did.
4. Submit the summary to your instructor as requested.

IC3 3-1.1.3 3-1.2.4 3-1.2.5 3-1.2.7 3-1.2.9

CRITICAL THINKING

CRITICAL THINKING 28–1

In this lesson you learned about the InPrivacy browsing feature.

1. Use your word processing application to write a brief summary about why you would, or would not, use the InPrivacy browsing feature.
2. Submit the summary to your instructor as requested.

IC3 3-1.2.7

CRITICAL THINKING 28–2

Bill has an Internet connection at home. His router is about 7 years old, but it still works. Would you recommend that Bill buy a new router?

1. Write a brief paragraph about your recommendation to Bill, and provide the reason for your recommendation.
2. Submit the paragraph with your recommendation to your instructor as requested.

IC3 3-1.2.10 3-2.1.1

ONLINE DISCOVERY

Internet Explorer provides the feature "immersive browsing" that enables you to synchronize tabs, favorites, and other settings across all your Windows 8.1 devices using the same Microsoft account.

1. Search the Internet for information about how to change the settings to sync your devices.
2. Cite the Web site where you found the information. If you are using a public computer, do not make any changes.
3. Share your search results with a classmate, and compare the information.
4. Submit the Web site citation to your instructor as requested.

IC3 3-1.1.3 3-1.2.5 3-1.2.7 3-1.2.9

JOB SKILLS

Career Web sites such as Monster.com and usajobs.gov provide articles, videos, advice, and other resources to prepare for a job search, change careers, and other topics.

1. Search for a career Web site.
2. Using the tabs and hyperlinks, navigate to articles, videos, advice, and other resources to prepare for a job search, develop a career, change careers, and other topics.
3. List at least four ideas, tips, or steps mentioned in the article.
4. Submit the list to your instructor as requested.

IC3
3-1.1.3
3-1.2.2

EXPLORE AND SOLVE

Windows 8.1 makes multitasking easy. If you are shopping online, Windows conveniently allows you to show two Web sites side by side on your screen.

1. Research the Help screens and the Internet to explore how to display two Web pages side-by-side.
2. Write a brief summary describing how to display the pages side-by-side.
3. Test the information in your summary to confirm that you explained the steps accurately.
4. Submit the summary to your instructor as requested.

IC3
3-1.1.3
3-1.2.9



Estimated Time:
1 hour

LESSON 29

Web Content

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Use keywords to search for information.
- Use advanced features to refine a search.
- Search for specific types of media or disciplines.
- Find content on a Web page.
- Evaluate the quality of the Web page content.
- Observe intellectual property laws.
- Copy and print content on a Web page.
- Cite Internet resources.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

Boolean logic search
copyright
Creative Commons (CC) license
intellectual property
keywords
knowledge base
meta tag
metasearch engine
plagiarism
public domain
related search
search directory
search engine
spiders
stemming
trademark
Web directory
Webcrawlers

Microsoft product screenshots used with permission from Microsoft Corporation.

As the use of the World Wide Web continues to grow, it is important to understand how to find information effectively. But the task doesn't end there. Once you find the information you want, it is important to know how to evaluate the credibility of the information and observe intellectual property laws.



3-1.2.8
3-6.1.1
3-6.2.2

Searching for Information on the Web

The Internet is a valuable source for acquiring knowledge and solving problems. As the Internet continues to expand, finding accurate and reliable Web sites, information, and answers to questions depends on using resourceful search tools effectively. Two primary tools are available for online searches—a search engine and a Web directory.

VOCABULARY
search engine
Webcrawlers
spiders
meta tag
metasearch engine
Web directory
search directory

A ***search engine*** is a program that searches documents for specified keywords and then provides a list of the sources where the keywords were found. Without search engines, you would need to know the specific URL to find information on the Web. There are a number of search providers available, such as Bing, Google, and Yahoo!. No single tool indexes or organizes the entire Web. When using an online search tool, you are not really searching the Web; you are actually searching and viewing a database in a search engine.

Internet Explorer provides the Bing.com search engine. But if you don't find what you're looking for, you can choose from several other search engines.

Even though they work differently, all Web search engines use ***Webcrawlers*** (also called ***spiders***), which are automated software applications that use an algorithm to search Web sites for relevant information. The Webcrawler reads the page titles, textual content, and the meta tags for a Web site. A ***meta tag*** is an HTML coding statement that describes some aspect of the Web page content. The Webcrawler also follows the Web site links. When relevant information is found, the URL data is then transmitted to a central depository and indexed in the search engine's database, so the URL will show as a search result. Not all search engines use the same algorithm. As a result, not all search engine databases are the same, which explains why you often see different results when you use different search engines.

A ***metasearch engine*** sends queries to several other search engines. Dogpile and Kayak are examples of popular metasearch providers that enable users to enter search criteria once and access multiple search engines simultaneously. The metasearch engine combines the results received from all the search engines. The benefits of using a metasearch engine are that you can search multiple search engine databases at the same time and see a broader range of results. However, the results are not always better because the metasearch engine must use its own algorithm to choose the best results.

A ***Web directory*** (also referred to as a ***search directory***) is a collection of Web sites organized by category, and then they are often further organized by geographic region. The purpose of the Web directory is the same as the search engine—to locate specific information. The difference is that a Web directory index is created by humans, not software. Examples of Web directories include Yahoo! Directory (dir.yahoo.com), Open Directory Project (dmoz.org), and Bing Directory (bingbusinessdirectory.com).

The Web site owner can directly submit the URL to be added to a Web directory, or the directory editors can explore the Web, review the Web site, and submit the URL. Only information approved by the directory editors is indexed in the Web directory database. There is sometimes a fee for submitting a URL to a search directory, but it can be a cost-effective way to enhance the visibility of the Web site. The advantage of a Web directory is its ability to organize data.

Many search engines and directories contain both a computer-generated index and a human-generated index, and they are referred to as hybrids. If you are looking for comprehensive results, a search engine is your better choice. If you want a selected guide with limited results, a Web directory may be the more useful tool.

Searching for Keywords

3-6.1.1
3-6.1.2
3-6.2.2
3-6.2.3

To answer questions and solve problems, you use a search engine to search for ***keywords***, words that describe the information the user is trying to locate. The keywords enable you to get specific information from dependable sources. By default, most search engines perform a Match Any search. The list of results will first display pages that contain all your keywords, then the list will show results for pages that contain some of your keywords.

Some search engines provide an additional enhancement called concept-based searching. The search engine displays results that relate to documents containing related concepts, not just the keywords. For example, if you search for "recycling electronics," the search engine might also return hits on sites that contain "e-waste."

Another feature supported by most search engines is ***stemming***. When you search for a word, the search engine also searches for the root forms of the keywords, so the search results include additional variations of the keywords. For example, when you enter the search word "player," you may also get back results for "play," "playing," and "plays."

Another feature provided by several search engines is a ***related search***. These are preprogrammed queries or questions suggested by the search engine that often lead to other Web pages containing similar information. A related search can improve your odds of finding the information you are seeking. Several search providers offer this feature, although they may use different terminology. Look for terms such as "similar pages," "related pages," or "more pages like this." Many search providers list related search terms at the bottom of the search results.

If you don't find what you're looking for, you can use a different search provider. There are many search engines available, and most of them are free downloads.

VOCABULARY

keywords

stemming

related search

QUICK TIP

It is always a good idea to capitalize proper nouns because some search engines distinguish between upper- and lowercase letters. On the other hand, if you capitalize a common noun such as "Bread," you will find fewer Web pages than if you enter "bread."

Step-by-Step 29.1

1. Open your Web browser as you normally do, and then open **Bing.com**.
2. In the *Search* box, type **mountain bike race**, and then click the **Search** button (or press **Enter**) to display the search results. Note that the list of results includes all Web pages that contain any of the three keywords. Note the number of Web pages found. See **Figure 29–1**. The number of your results will most likely differ.

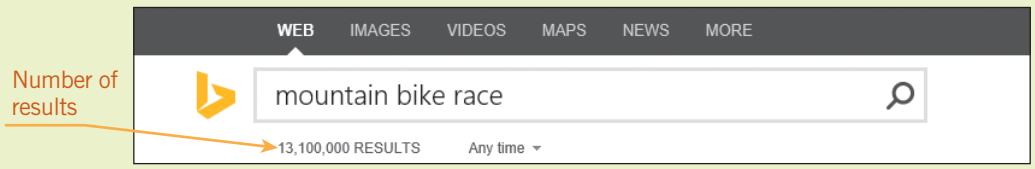


FIGURE 29–1
Number of Web pages found

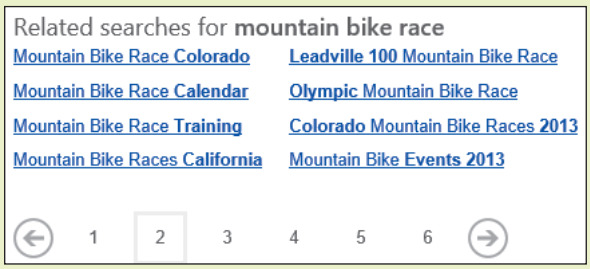
QUICK TIP

In Windows 8, there's no need to open a browser—just start typing the URL from the Start screen.

3. Scroll down through the list of results. Each result provides the Web page title, a URL link to the Web page, and a brief description of the content. (The first few results in the list might be links to Web pages for sponsors of the search engine.) The list includes results for concepts related to "mountain bike race" such as trail maps, directions, blogs, reviews, etc. Sometimes a date is also included in the description which displays when the page was either posted or last updated.

4. Read some of the descriptions for the Web pages. Note that in some of the descriptions, the keywords matched in the content are formatted bold. Also note that some of the bolded words are an exact match for the keywords. Because of stemming, other variations of the keywords, such as "racing" or "races," are included in the list of results.
5. Scroll to the bottom of the screen. As shown in **Figure 29–2**, links are provided for related searches for the keywords in the search query.

FIGURE 29–2
Related searches



6. If your browser is open in Windows 8 mode, open the Address bar at the bottom of the screen. In the Address bar, enter **Google.com** and then click the **Go** button.
7. In the *Search* box, type **mountain bike race**, and then press **Enter**. Note the number of results for the search query. The number of results will most likely be different than the Bing search results because the Google search engine uses a different database than the Bing search engine.
8. Leave the browser open for the next Step-by-Step.

IC3
3-1.2.8
3-6.1.1
3-6.1.2

Refining Your Search

Using specific keywords will likely lead to more accurate search results. Although search engines differ, there are several tools you can use to make your keywords more effective. Using phrases, Boolean operators, or math symbols will generally help you control and refine a search so that it does not generate irrelevant results.

If you want to search for words that appear next to each other, you can enter the phrase within quotation marks. The search engine matches those words that appear adjacent to each other and in the order you specify. If you are searching for more than one phrase, you can separate phrases or proper names with a comma. For example, to find Mickey Mantle baseball cards, enter "baseball cards","Mickey Mantle."

To make keywords more specific and narrow your search results, you can use Boolean logic. A ***Boolean logic search*** uses three primary logical operators AND, OR, and NOT to define the search. When using these operators, type all the letters in uppercase. The AND operator makes sure that all the terms in a search appear in the Web page. This is a Match All search, rather than a Match Any search. The more terms you combine with AND, the narrower the results. The NOT operator restricts the search by excluding pages that contain the term. You can use the OR operator to search for synonyms or similar concepts. In contrast to the AND and NOT operators, the OR operator creates more results.

Sometimes search engines support the math equivalents of the operators. For example, instead of using the operator AND, you can insert a plus symbol (+) before a term that you want to appear on the page. To subtract terms you do not want, insert the minus symbol (–) before each term. Insert the [|] symbol to search for synonyms.

VOCABULARY
Boolean logic search

ABOVE AND BEYOND

Boolean logic is named after its inventor, George Boole, an English mathematician who wrote about a system of logic in the nineteenth century. Because Boolean logic provides the foundation of modern computer logic, Boole is now considered a founder of computer science.

When you are searching the Web, it is important to notice the date of when the information was posted. Some search engines provide options for specific time periods, and you may be able to use a date tool in the search query to filter the search by date.

Some search providers assist you with your search through the use of forms. Using this form, you can add words and phrases to include and/or exclude. Advanced search forms also often provide options to create a logical search or specify a time period, region, or language. To access the form, look for a hyperlink such as "Advanced Search" or "Advanced Options" on the search engine's main page.

Step-by-Step 29.2

1. If necessary, open your Web browser. Open **Yahoo.com**.
2. In the *Search* box on the Yahoo.com page, enter **cookie AND recipe AND chocolate**, and then click the **Search** button. The number of results shows Web pages that match all three words.
3. In the *Search* box, position the insertion point after the word "chocolate," press the **spacebar**, and type **NOT chip**. Then click the **Search** button. The results no longer show Web pages that contain the word "chip."
4. In the *Search* box, change the query to **cookie AND recipe AND chocolate OR fudge** and then click the **Search** button. The results show pages that also include the keyword fudge.
5. In the Address bar, type **Bing.com** and then click the **Go** button.
6. In the *Search* box, enter **"cookie recipe","chocolate fudge"** and then click the **Search** button. The list of results displays only Web pages that contain both phrases. Also note that some of the matches are for "cookies" and not "cookie."
7. In the upper-right corner of the screen, click the **Preferences** button to open the Settings options shown in **Figure 29–3**. Compare your settings to those shown in the figure, which shows the Bing default settings. Do not make any changes. At the bottom of the screen, click the **Cancel** button.

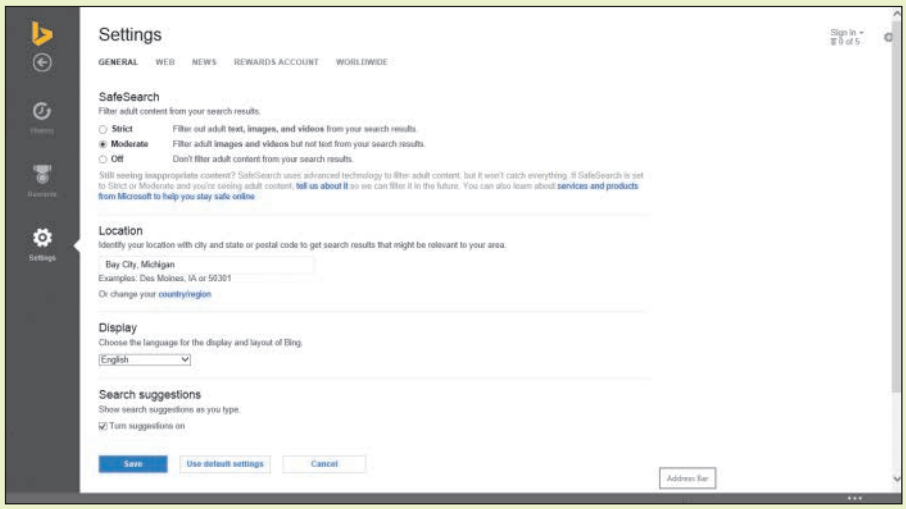


FIGURE 29–3
Default settings in Bing search engine

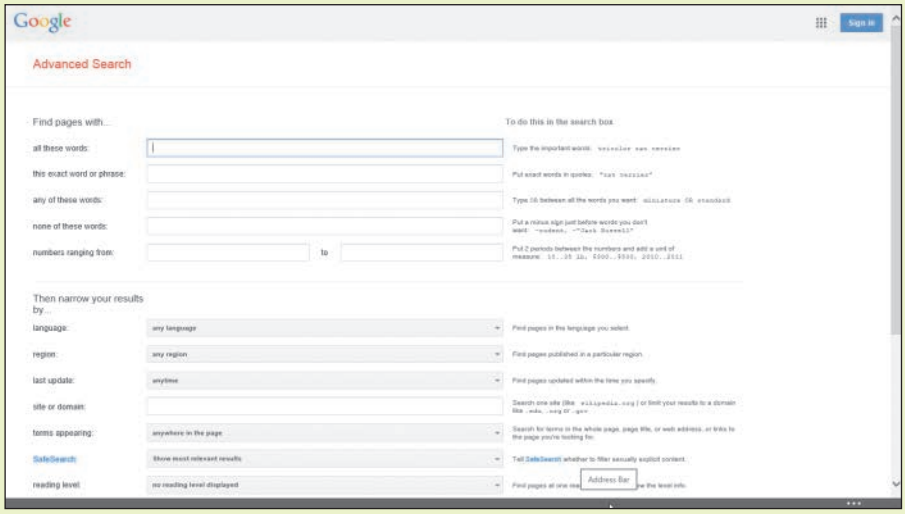
8. Under the *Search* box, click the **Any time** list arrow and then in the menu click **Past month**. The list of results changes and the most current postings appear at the top of the list. Many of the descriptions now include the number of days ago that the page was posted or updated.
9. In the *Search* box, type **chocolate cookie recipe** and then click the **Search** button. Note the number of results for the last search.
10. Position the insertion point after the word "recipe," press the **spacebar**, and type **>06/01/2010**. Click the **Search** button. The list of results changes and the number of results is significantly reduced because only results posted after June 1, 2010 are included in the list.
11. In the Address bar, enter **Google.com** and then click the **Go** button.
12. Click the **Settings** link located at the bottom right of the screen. (In Windows 8 mode, you may need to hide the Address bar to see it.) Then in the menu click **Search settings** to display the default settings. Scroll through to review the settings, but do not make any changes.
13. Click the **Back** button to return to the Google home page. Click the **Settings** link, and then in the menu click **Advanced search** to display the search form shown in **Figure 29–4**.

QUICK TIP

Some Web pages display date and time stamps at the bottom of the page to document when the content was posted or updated. You can also sometimes find a post date in the URL.

QUICK TIP

You can also identify a timeframe in a search query by entering two different years with a period between the two references. For example, 2012.2014 will show results for all pages posted during the years 2012, 2013, and 2014.



Courtesy of Google

FIGURE 29–4
Google search form

QUICK TIP

To change the Bing settings in Windows 8 view, click the Settings button on the Charms bar, click Change PC settings, and then click Search and apps.

QUICK TIP

Most search engines provide advanced search settings. On the search engine home page, look for links such as Preferences, Settings, Advanced Searches, or Options.

14. Use the Google form to refine the search for a chocolate cookie recipe without chips:
    a. Under *Find pages with*, in the *all these words* text box, type **cookie recipe chocolate**.
    b. In the *none of these words* text box, type **chip**.
    c. If necessary, scroll down to the *Then narrow your results by* section. Click the **last update** list arrow and then in the menu click **past year**.
    d. If necessary scroll down to the bottom of the screen, click the **Advanced Search** button. The search results are filtered using the information provided in the form. Note the query in the Search box shows a minus symbol before the word "chip."
15. Leave the browser open for the next Step-by-Step.

Searching for Specific Types of Media or Disciplines

IC3
3-1.2.8
3-6.1.1
3-6.1.2
3-6.3.1

You can further refine your search by entering criteria for different types of media, such as videos, or by identifying a specific file type, such as a .png.

You can search for different types of media by searching related databases. For example, you can search youtube.com for videos, you can search itunes.com for music, and you can search flickr.com for photos. Web sites like these often organize information by category, which makes the search go faster.

Because large Web sites contain many pages and links, they often provide their own search engine that allows users to find what they need specific to the site. Likewise, most browsers provide a search box so you can search for key words or characters on the current page.

You can also use search engines to search for information for a specific Web site or for a specific domain type. For example, you can search for government Web sites or education Web sites.

Not all information on the Web is posted in an HTML file format. For example, sometimes when you open a Web page, it prompts you to open the document in Adobe Reader. Many academic papers are uploaded to the Web in PDF format.

Step-by-Step 29.3



1. If necessary, open your Web browser. In the Address bar, type **USA.gov** and then click the **Go** button.
2. The USA government Web site provides a search engine to find information within the Web site. In the Web site *Search* box, type **images** and then click the **Search** button. In the left margin, under *Search*, click **Images** (or a link to a photo gallery).
3. In the Web site *Search* box, type **ocean pollution** and then click the **Search** button. The photos that now display are all related to the keywords "ocean pollution."
4. In the Address bar, type **yahoo.com** and then click the **Go** button.

5. In the *Search* box, type **e-waste recycling site.gov** and then click the **Search** button.
6. Scroll down through the list of results. Note that with the exception of a few sponsored links at the top of the list of results, every URL in the list shows the .gov domain extension. All the results for the search query are government Web pages.
7. In the *Search* box, position the insertion point after "gov." Press the **spacebar** and type **filetype.pdf**. Click the **Search** button.
8. Scroll down through the list of results. Note that each result shows the file format is PDF.
9. Leave the browser open for the next Step-by-Step.

3-6.1.1
3-6.1.2

Finding Content on a Web Page

After searching for matches and navigating to a specific Web page, you still have access to search tools to find words and phrases on the Web page. Most browsers provide a Find bar which enables you to quickly locate keywords.

Step-by-Step 29.4

1. If necessary, open your Web browser. In the Address bar, type **nps.gov** and then click the **Go** button.
2. In the Web site *Search* box, type **yosemite waterfalls** and then press **Enter**.
3. Click a link to navigate to an article about waterfalls in the Yosemite park.
4. If your browser is open in Windows 8 mode, click the **Page tools** button and then click **Find on page**. The Find bar shown in **Figure 29–5** displays at the bottom of the screen. If your browser is open in Desktop mode, press **Ctrl+F** to display the Find bar at the top of the screen as shown in **Figure 29–6**.

QUICK TIP

In most browsers, you can use the shortcut key combination CTRL+F to display the Find bar.



FIGURE 29–5
The Find bar in Windows 8 mode

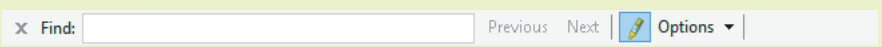


FIGURE 29–6
The Find bar in Desktop mode

5. In the *Find* box, type **waterfall**. All the matches for the word "waterfall" are highlighted yellow.
6. Click the **Next** button to navigate to and select the first match. Click the **Next** button several more times to navigate to the next match.
7. Click the **Previous** button to navigate to the previous match.
8. Leave the browser open for Step-by-Step 29.5.

Evaluating the Credibility of Web Page Content

The Internet contains Web sites on every imaginable topic and come from sources around the world. Anyone can publish information of any type on the Internet—true or false, factual or incorrect. The Internet does not enforce rules or quality controls about content. Therefore, you should not accept everything as true and accurate. As with any other document, you must evaluate the nature and source of the information.

When considering whether to use the content of a Web page, do not accept any information presented on the Internet at face value. The source of the information should be clearly stated, whether it is original or borrowed from somewhere else. Ask yourself the following questions to assess the relevance and reliability of the information.

- What is the purpose of the Web site?

  Institutional sites for schools, nonprofit organizations, or government agencies should clearly state their mission. A commercial Web site (.com or .net) may be presented in a way that promotes a product or service. If the site provides links to other sites, the linked sites should contain valuable information that enhances your knowledge. Companies pay for online ads to attract you to their products, and the messages are not necessarily factual. Sponsored links that pop up on a Web page are also a source of advertising, and you should not always consider these linked sites as reliable resources.

  Forums are online discussions among individuals with an interest in a specific topic. Although those who participate in the discussions may not be experts, the information they provide can be very useful. However, you must still confirm the validity of the information shared at all of these types of Web sites. A good forum participant only posts good information and does not flame (verbally attack or send offensive messages) other participants.

  A wiki can contain entries from any numbers of users. An entry could be from an expert or from a lay person. No qualifications or expertise is required for the person contributing to the wiki.

- Does the content meet your needs?

  Explore the information to determine if the information is factual, biased, or opinionated. Sometimes articles are published to document research findings, but articles are also created to provide product reviews and express personal opinions. Ideas and opinions supported by references are additional signs of the value of the site.

  A ***knowledge base*** is a collection of data related to a specific subject. Many knowledge bases provide frequently asked questions, policies, and manuals. For example, a printer manufacturer often provides a Web site with Help menus so that users can access information and tutorials to learn about features and Help menus to troubleshoot problems.

- Is the information accurate, current, and broad enough?

  To determine the validity of the information, check other online resources, books, professional journals, and offline sources that contain similar information. Determine if the content is current and if it covers a specific point of view.

- Does the information come from a source that can be trusted?

  Find the author or the company who provided the information. The domain name and domain type will indicate the type of source, such as government sites, published journals, and personal Web sites.

ABOVE AND BEYOND

If someone publishes information that is not true and that may give another person, business, product, group, government, or nation a negative image, they can be sued for libel and forced to pay compensation for any damages they caused.

VOCABULARY

knowledge base

Look for references and links to outside sources that confirm the information. For a commercial Web site, you should be able to contact a representative by phone or e-mail. For articles and opinions, check to see if there is an option to communicate with the Web site author. Confirm the author's knowledge and experience. For example, if the author's title is a professor at a university, visit the university Web site to confirm that the author is on the university staff list.

Blogs generally represent the views and beliefs of the author or owner. Information might be skewed based on the owner's personal experiences and preferences, so you may or may not agree with information contained on the blog.

- Is the Web site layout professional?

  The overall page layout and ease of navigation is important. The Web site should be well-organized and well-designed, and all the links should work effectively.

- Is the writing style and language appropriate?

  The page should be free of spelling and grammatical errors. Even if the page appears to contain valuable information, misspelled words and incorrect grammar can be warning signs that the information itself is not completely reliable. The style of writing and the language used can also reveal information about the quality of the site. If the style is objective, the chances are the information is worthy of your attention. However, if the writing style is opinionated and subjective, you may want to reconsider using the site for gaining information.



3-4.2.3
3-4.2.5
3-4.2.7

Observing Intellectual Property Laws

For the most part, information displayed on a Web site is easy to copy. Often you can select the text or graphics that you want to copy, use your browser's Copy command, and then paste the content into another document. You can also display a page on your monitor and print the entire page. The ease with which information can be copied, however, does not mean that users have the right to do this.

VOCABULARY

copyright

intellectual property

trademark

public domain

Most sites have copyright protections. A ***copyright*** is the exclusive right, granted by law for a certain number of years, to make and use literary, musical, or artistic work. The recognition of the ownership of those rights is referred to as ***intellectual property***. Even if the copyright notice isn't displayed prominently on the page, someone wrote or is responsible for the creation of the content on a Web page. This means that you cannot use the information as your own. You must give credit to the person who created the work.

If Internet content, such as a music file, is copyrighted, it cannot be copied without the copyright holder's permission. To copy without permission is a violation of copyright laws. Violating these laws can lead to criminal charges for theft as well as civil lawsuits for monetary damages.

A company's logo or other graphic information may be protected as a ***trademark***, which means much the same thing as a copyright but relates specifically to the exclusive right to visual or commercial images rather than text or intellectual property. In addition, processes and business methods may be protected by patents, which guarantee the inventor exclusive rights to the process or method for a certain period of time.

When intellectual property rights have been forfeited or expired, then the work is considered to be in the ***public domain*** and the literary, musical, or artistic work is available for anyone to copy or use. Copyright and patent laws do provide certain exceptions to the general prohibition against copying. The U.S. copyright law allows for the fair use of properly identified copyrighted material that is merely a small part of a larger research project or cited as part of a critique or review.

A ***Creative Commons (CC) license*** enables authors to control how others may use their work. The author keeps the copyright but grants permission to others to use their work, as long as those who use the work give the author credit and abide by the conditions specified in the license. Many musicians use CC licenses to grant permission allowing their songs to appear in videos uploaded to YouTube.com. Another example where CC licenses are used is Flickr.com, a Web site where you can share photos and videos.

CC licenses enable authors to share their knowledge and creativity with the world. People can be better informed and work collaboratively and share information, which enhances learning and produces new and innovative services that help the community.

VOCABULARY
Creative Commons (CC) license

Copying and Printing Web Page Content

IC3
3-1.1.1
3-1.1.3

You can copy and save specific elements of a Web page to a disk or to the Cloud and then use them in a new document or file. For example, you might want to save a photo or copy a paragraph of text you want to quote in a report. You can then open the saved files in other programs or paste them into new documents, such as a word-processing document, where you can edit and manipulate the content as desired.

You can also print a copy of a Web page directly from your browser. Most browsers provide page setup options that enable you to control how the Web page prints. Sometimes a single Web page will print on multiple sheets of paper, and advertisements and Web page instructions will also print. Therefore, it is always best to preview how the Web page will print before sending the file to the printer.

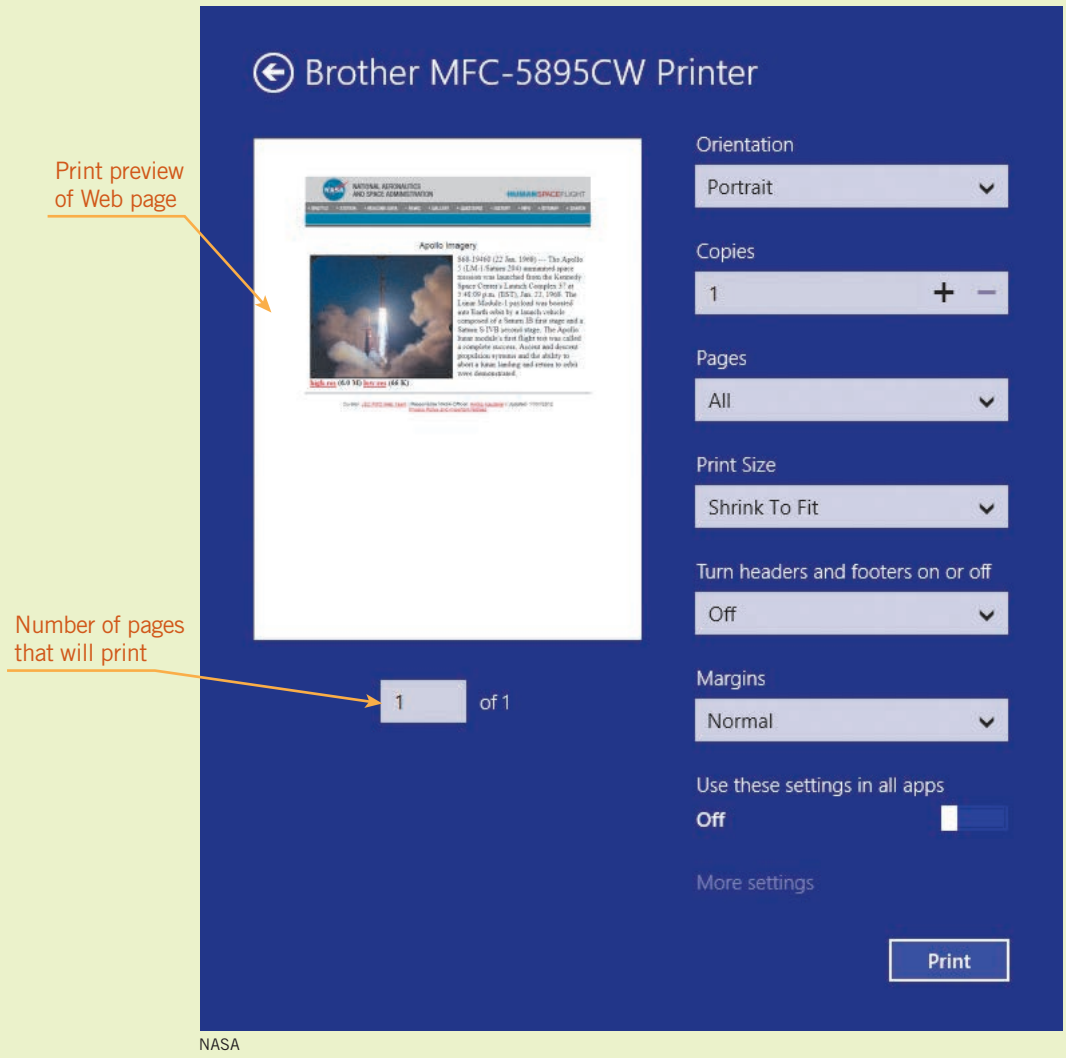
Step-by-Step 29.5

1. Open a new blank document in the Word application.
2. If necessary, open your browser. In the Address bar, type **nasa.gov** and then click the **Go** button.
3. In the Web site *Search* box, type **Apollo missions** and then click the **Search** button. Click a link to navigate to an article about one of the Apollo missions.
4. Select a paragraph of text. Right-click the **selected text**, and then click **Copy** on the shortcut menu to copy the text to the Clipboard.
5. Switch to the Word document, and then paste the text into the document.
6. Switch back to your browser. In the *Search* box, type **Apollo images** and then click the **Search** button. Navigate to a photo gallery.
7. Right-click an **image** of your choice. In the shortcut menu, click **Copy**. Then switch to the Word document and paste the image in the document.
8. Close the Word document without saving the changes.

QUICK TIP

Sometimes when you copy and paste content from the Web, a citation providing the source of the information is automatically included with the pasted content.

9. In the browser window, right-click the **image** again.
   a. If your browser is open in Windows 8 mode, you will see the option to *Save the file to the picture folder*. Do not save the file.
   b. If your browser is open in Desktop mode, you will see the option *Save picture as*. When you choose this option, the Save Picture dialog box opens and you can navigate to the drive and folder where you want to save the file and also change the filename. Do not save the file.
10. Click outside the shortcut menu to close the menu.
11. If your browser is open in Windows 8 mode, complete the following steps. If your browser is open in Desktop mode, go to Step 12.
    a. On the Charms menu, click the **Devices** button, and then click **Print**. If necessary, select a printer. The Printer pane opens, similar to the one shown in **Figure 29–7**.



NASA

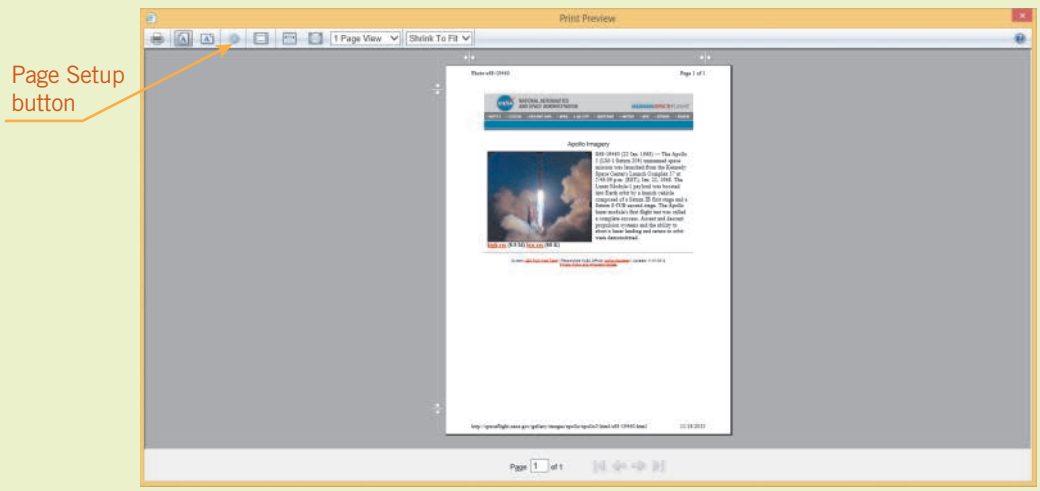
FIGURE 29–7
Print pane in Windows 8 mode

b. Note that the preview shows the total number of pages that will print. There are several options for changing the print settings, such as the orientation, the pages you want to print, the print size, and margins. You can also choose whether or not to print headers and footers.

c. After confirming the settings, you would click the Print button. Do not print the document. Click in a blank area in the browser window to close the Print pane.

12. If your browser is open in Desktop mode, complete the following steps.

a. Click the **Tools** button on the browser's menu bar and then in the menu click **Print**. In the submenu, click **Print preview**. As shown in **Figure 29–8**, the Print Preview window opens and the Web page displays as it will print. At the bottom of the screen you can see the number of pages that will print.



NASA

FIGURE 29–8
Print preview in Desktop mode

b. Note that the toolbar at the top of the screen provides options to adjust the document orientation, the view of the pages, and the scaling of the page content. Click the **Page Setup** button to open the Page Setup dialog box for more page setup options. Close the dialog box without making any changes.

c. When you are ready to print, you click the Print button in the upper-left corner of the screen. Do not print the document. In the upper-right corner of the screen, click the **Close** button to close the Print Preview window.

13. Close the browser window.

Citing Internet Resources

VOCABULARY
plagiarism

You must cite Internet resources used in reports and other documents. In an academic setting, claiming someone else's words, or intellectual property, as your own is called ***plagiarism***. You must give proper credit to any information you include in a report that is not your original words or ideas. Providing credits and citations also provides the reader of the document with information about additional research.

Core elements in citing material include the author's name, the date of publication or last update, the document or Web page title, the URL where the content is hosted, and the date you accessed the source. There are several style preferences for citing or referencing online sources. Common citation styles include APA (American Psychological Association), Chicago/Turabian, and MLA (Modern Language Association). It is important for students to follow the style requested by the instructor.

TECHNOLOGY CAREERS

Web Content Writer or Developer

If you like to work with Web pages, consider a career as a Web content writer or producer. Writers often create press releases, articles, and journal entries for company blogs. To develop Web content, you need to be familiar with how search engines work so that your Web pages appear in search results. You also need to be proficient with HTML, particularly with writing and formatting text and adding links and keywords to a page. Web developers often work with other media such as video or audio and coordinate those sources into a Web site. In some cases, you work with Web content using a content management system (CMS), which is software that helps you create, edit, manage, and publish content in a consistent format and organization. You might also need to use Web analytics, which are tools for tracking visitors to a Web site and determining whether the site meets your business objectives.

SUMMARY



In this lesson, you learned:

- When searching online, one of the primary tools you can use to find information is a search engine.
- You use a search engine to search for keywords.
- Many search engines offer advanced search options that let you filter search results with specific criteria.
- To filter your search, you can search for specific types of media or disciplines.
- Many Web sites provide their own search engines so you can find content within the Web site.
- Before accepting that the information is correct and truthful, you must evaluate the quality of the Web page content.
- You can copy and print content on a Web page, but you must observe intellectual property laws so you don't commit plagiarism.
- When you use information from the Internet, you should cite the resources.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. When you are using an online search tool, you are not really searching the Web.

T F 2. A search engine will only provide results for Web pages posted in an HTML file format.

T F 3. Work that is in the public domain is available for anyone to copy or use.

T F 4. You can print a Web page directly from your browser.

T F 5. Some search engines assist you with your logical search through the use of forms.

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided:

1. A(n) _____ is an HTML coding statement that describes some aspect of the Web page content.
2. _____ are automated software applications that use an algorithm to search Web sites for relevant information.
3. _____ is the exclusive right to make and use literary, musical, or artistic work.
4. The _____ feature in a search engine provides search results that include additional variations of the keywords.
5. _____ is claiming someone else's words as your own.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What type of data is provided in a knowledge base?

2. What are the benefits of using a metasearch engine?

3. What is the difference between a search engine and a Web directory?

4. How can you refine a search query to search for words that appear next to each other?

5. What is the difference between a copyright and a trademark?

PROJECTS

PROJECT 29–1

IC3 3-6.1.1 3-6.1.2 3-6.2.5

1. Using a search engine of your choice, perform a basic search for the keywords **Midwest travel destinations**. Note the number of results. Scroll through the list of results and review the domain names and domain types that appear in the list.
2. Perform another basic search using a different search engine. Be sure to use exactly the same keywords and in the same sequence. Note the number of results and review the domain names in the list of results.
3. Complete the search one more time using a third search engine. Note the number of results and review the domain names in the list of results.
4. Determine which search engine provided you with the highest-quality results, and explain why you chose that search engine.
5. Prepare a brief summary of your three searches. In the summary, mention the three search engines you used and how many results you found with each search engine. Also mention the type of domain name that usually appeared in the list of results. Determine which search engine provided you the highest-quality results, and explain the reasons for your choice.
6. Submit the summary as directed by your instructor.
7. Leave the browser open for the next project.

PROJECT 29–2

3-1.2.8
3-6.1.1
3-6.1.2

1. Use a search engine of your choice to search for information about restaurants in your area. Note the number of results.
2. Narrow the search to eliminate the Web pages containing a certain keyword, such as "breakfast" or "dinner." Note the number of results.
3. Narrow the search to include Web pages posted within the last week. Note the number of results.
4. Compare the number of results for each search.
5. Leave the browser open for the next project.

PROJECT 29–3

3-1.2.8
3-6.1.1
3-6.1.2
3-6.2.1
3-6.2.2
3-6.2.3
3-6.2.4
3-6.2.5
3-6.2.6
3-6.3.1

1. Using the techniques you learned in this lesson, search the Web for information about how to prepare for a video job interview.
2. Choose two Web pages in the list of results. Evaluate the quality of the content on each Web page.
3. Compare and contrast the reliability and validity of the two sites.
4. Write a brief summary of your evaluation.
5. Submit the summary as directed by your instructor.
6. Leave the browser open for the next project.

PROJECT 29–4

3-1.2.8
3-4.2.3
3-6.1.1
3-6.1.2

1. Open a new blank document in Word.
2. Open your browser and navigate to the **noaa.gov** Web site.
3. Search for articles about ocean pollution.
4. Copy a paragraph of text to the Clipboard, and then switch to the Word document and paste the text in the document.
5. Switch back to the Web page. If necessary, navigate to find an image related to ocean pollution. Copy the image to the Clipboard, and then switch to the Word document and paste the image in the document.
6. Switch back to the Web page and copy the URL. Then switch to the Word document and paste the URL in the document, below the text and image. After the URL, press **Enter** and type **Accessed** and then type the current date.
7. Save the Word document as **Ocean Pollution**, followed by your initials. Then close the Word document.
8. Leave the browser open for the next project.

TEAMWORK PROJECT

3-1.2.8
3-4.2.3
3-6.1.1
3-6.1.2
3-6.2.1
3-6.2.2
3-6.2.3
3-6.2.4
3-6.2.5
3-6.2.6

1. Search the Internet using your own choice of keywords and search tools (such as Boolean operators or related searches) for national parks that are within a 500-mile radius of your location.
2. Create a list of the national parks that meet the search criteria.
3. Cite your sources for the information.
4. Compare your list of parks with a classmate to see if your lists are the same. Also compare your sources.
5. With your partner, review the content that each of you used to prepare you list and evaluate the reliability and credibility of each of the sources.

CRITICAL THINKING

CRITICAL THINKING 29–1

3-6.3.1

1. Provide an example of when you would use the search for file type feature to locate information on the Web.
2. Write a brief summary of your response.
3. Submit the summary as directed by your instructor.

CRITICAL THINKING 29–2

3-1.2.8

Explain why it is valuable to see the date and time stamp in the list of results.

1. Write a brief summary of your response.
2. Submit the summary as directed by your instructor.

ONLINE DISCOVERY

Many libraries and schools publish guidelines for evaluating Web content.

1. Use a search engine of your choice to search for guidelines to evaluate Web content.
2. Using the information you gathered from one or more sites, using your own words and ideas, create a list of guidelines that you would recommend using to evaluate Web page content.
3. Cite the source by including the author name, URL, and the date you accessed the information.
4. Submit the list as directed by your instructor.

IC3
3-4.2.3
3-6.2.1
3-6.2.2
3-6.2.3
3-6.2.4
3-6.2.5
3-6.2.6

JOB SKILLS

An online identity includes a name and other characteristics used online, such as the user name and description used for a social networking site. Before hiring a new employee, many employers search the Internet for information about the job candidate.

1. Using a search engine, research the topic of online identity.
2. List four pros and four cons to using your real name in your online identity.
3. Submit the list as directed by your instructor.

IC3
3-1.2.2
3-1.2.8
3-6.1.1
3-6.1.2

EXPLORE AND SOLVE

Some search engines provide a feature that enables you to filter search results using Creative Commons licenses.

1. Explore the advanced search features in your browser to see how you can filter searches for Creative Commons licenses.
2. Write a brief summary of your findings.
3. Submit the summary as directed by your instructor.

IC3
3-1.1.1
3-1.1.2
3-1.2.1
3-1.2.2



Estimated Time:
1 hour

LESSON 30

Technology and Society

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Describe how computers facilitate and enhance activities at work, school, and home.
- Describe how devices are commonly used in daily life.
- Describe how technology is used to transform traditional processes.
- Identify assistive technologies.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

assistive technologies

business-to-business (B2B)

business-to-consumer (B2C)

business-to-government (B2G)

critical thinking

crowdsourcing

e-commerce (electronic commerce)

point-of-sale (POS) system

RFID (radio-frequency identification) tags

telecommuting

Microsoft product screenshots used with permission from Microsoft Corporation.

Over the last few decades technology has changed and continues to change almost every aspect of life. These changes are often swift and dramatic, and the trend of electronic innovation affecting daily life is sure to continue. Living in the twenty-first century means you will need to be tech savvy in order to keep up with these swift and dramatic changes. Being able to understand and make use of these electronic innovations will assist you in many areas of your life—from home, to school, and to the workplace.



3-3.1.1
3-3.2.1
3-3.2.2
3-6.1.1
3-6.1.2

Using Computers at Work, School, and Home

Technology today is integrated into almost every facet of life and influences your activities at work, school, and home. You most likely use a computer at your job, even if your job doesn't involve sitting at a desk. Computers are now the norm at school. Some schools even provide each student with their own personal computer. And computers at home now come in different forms like TVs, gaming consoles, tablets, or plain old desktops. Many people have a phone that is also a computer, with full Web technology options available for using the Internet while on the go.

Collecting Information

The Internet and the Web are the major forms of technology affecting your life today. Using the Internet is a fast and easy way to find the information you need. At home and at work, if you need to find the telephone number of a local company or order a pizza for lunch, you can use the computer to search for and find the number.

Not so long ago, if a science teacher gave the class a project to find out how antibiotics work, the students would go to the library and use encyclopedias and journals to research the topic. In most of today's classrooms, the students browse the Web to access the information. See **Figure 30–1**.



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FIGURE 30–1 Collecting information using a variety of electronic devices

Organizing Information

Computer software helps you organize information. You can use databases and spreadsheets to organize and calculate data in a variety of ways. After entering data into a database or spreadsheet, you can format, sort, and chart the data. In the workplace, the company you work for most likely uses spreadsheets for statistical data, tax information, or financial reporting. At home, you might use a spreadsheet to track a personal budget, list a collection of items such as baseball cards, and document expenses for income tax purposes. In the school environment, spreadsheets are integrated in curriculum for subjects such as mathematics, business management, marketing, and personal finance.

Evaluating Information

In addition to using spreadsheet applications to calculate numeric data, you can use spreadsheets to ask what-if questions and evaluate information. Spreadsheets contain mathematic and trigonometry functions as well as statistical functions such as Average, Count, Maximum, Minimum, and Percentile. Arranging data in tables and lists helps you evaluate the data by comparing one set of calculated results with another. Furthermore, creating charts helps you identify patterns or trends in the data. See **Figure 30–2**.



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FIGURE 30–2 Organizing and evaluating information

Communicating Information

When computers are connected through a network or to the Internet, users can exchange information instantaneously. Technology provides options such as e-mail, instant messaging, blogs, and audio visual communication. Access to the Cloud allows users to share documents, images, music, and videos.

Collaborating with Others and Solving Problems

You can share information you have stored on your computer or in the Cloud and collaborate with co-workers. Using online communities, you can collaborate with other people all over the world. The exchange and sharing of ideas on a global basis helps you see a problem from different viewpoints.

VOCABULARY
crowdsourcing

One type of online collaboration is ***crowdsourcing***, which combines the collective effort of many people to complete a task. Needed services and ideas are solicited from an online community instead of from employees or suppliers. Participants are asked to brainstorm, to solve a problem, or share their opinions. See **Figure 30–3**.



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FIGURE 30–3 Crowdsourcing

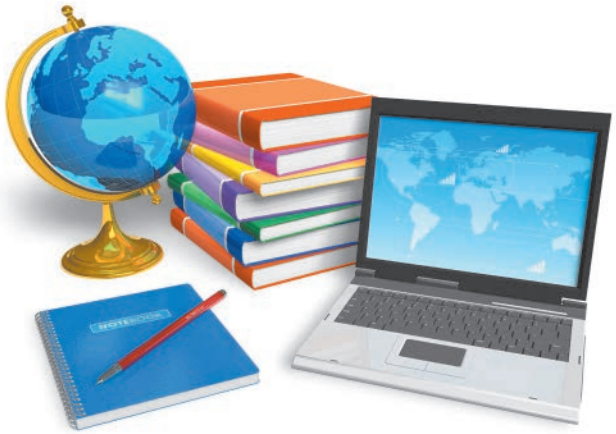
Online communities and social networking sites provide an opportunity to socialize with others who have common interests. For example, Instagram is an online community where people share photos and videos.

Increasing Productivity

Access to the Internet and the Web can increase your productivity by providing online access to multiple resources, including communication with experts and specialists. Applications can also enhance output and productivity.

Facilitating Learning

The Internet is an amazing resource for learning and discovering new facts and information. Many textbooks published today have an associated Web site where students can access Web-based projects and find supplemental videos, exercises, and activities for the textbook. Look in the front pages of this textbook to see information about Web sites that provide additional course materials for this textbook. Many students now have the option of using an electronic textbook (eBook) that can be read online. EBooks typically provide an electronic version of the full textbook as well as the supplemental material. EBooks can lighten the load in your backpack as you travel back and forth to school. See **Figure 30–4**.



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FIGURE 30–4 Learning and discovering

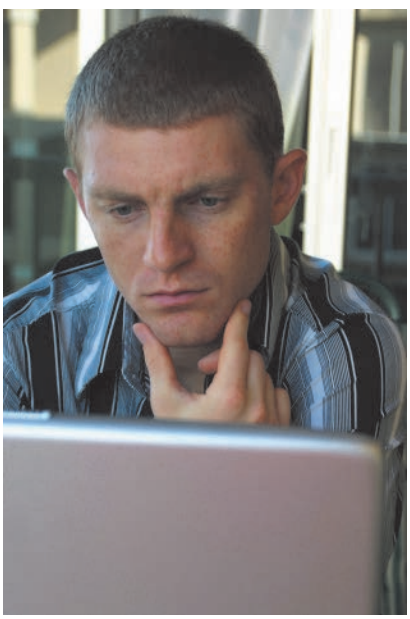
Promoting Creativity

Integrating technology into your class work provides you with an opportunity to demonstrate your inventiveness, individuality, and creativity. Modern technology provides tools you can use to create a range of artistic work that can be published for a real audience anywhere in the world. Project-based collaborations can further enhance creative learning and problem-solving.

Supporting Critical Thinking

When searching for information on the Internet, you need to use critical thinking. ***Critical thinking*** is the process of analyzing information, combining information, and evaluating information as a guide to making judgments. When reading information online, particularly pages that persuade you to buy or do something, do not act until you have analyzed the point of view and motivations, gathered and combined the information, and evaluated the information. See **Figure 30–5**.

VOCABULARY
critical thinking



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FIGURE 30–5 Evaluating information on the Internet

3-1.1.1

Using Computer Technology in Everyday Life

You probably perform day-to-day activities without thinking about computers and how they affect your life. In fact, using desktop and laptop computers represents only a fraction of your interactions with computer technology.

Facilitating Daily Life

You can access electronic catalogs, select goods, store them in a digital cart or bag, and then complete the purchase with a credit card or an online account. Organizations provide more than goods online. For example, if you need tickets for the basketball playoffs or an upcoming concert, you can purchase the tickets online, order a program, and in some cases select your seats.

Local, state, and national government Web sites provide access to many services. For example, many local government agencies provide Web sites where you can renew your driver's license, order vehicle plates, and sign up for municipal services. Perhaps you need a tax form—the Internal Revenue Service site provides all types of forms and other services so you can file forms electronically and even check on your refund. See **Figure 30–6**.



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FIGURE 30–6 IRS Web site

Automated Teller Machines

Many people with a bank account now take advantage of the convenience of automated teller machines (ATMs) to deposit or withdraw money. These automated banking machines are located at most banks, and they are also available in supermarkets, convenience stores, restaurants—even at the ballpark or museum. They allow you to do your banking almost anywhere, anytime. Banker's hours from 9:00 a.m. to 5:00 p.m. are definitely a thing of the past. See **Figure 30–7**.



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FIGURE 30–7 24-7 banking

You might not even need to get cash from an ATM for your shopping. Electronic checks and debit cards are making cash more obsolete every day. When you swipe your ATM card or debit card through the cashier's machine at your local store and then enter your personal identification number (PIN), information about your account is transferred to the store's computers and the amount of your purchase is deducted from your checking or savings account.

Credit and Debit Cards

Many people no longer carry large sums of money while traveling. They prefer to use ATM or credit cards. The magnetic strip on the back of the card increases efficiency. When you travel, using a card helps you keep track of your travel expenses. If you lose a credit card or a debit card, it can be canceled immediately, whereas if your money is lost or stolen, the chances of recovery are very small.

A security concern on the Internet, however, is the theft of credit card information stored electronically. Because the Internet makes transactions so quick and easy, credit card numbers that fall into the wrong hands can cause major problems for cardholders. Although effective encryption technologies keep credit card numbers secure, you can make your account even more secure by following simple precautions. Purchase items only from Web sites that you know are reputable and trustworthy. Read and understand the privacy and consumer-protection policies of online companies before you buy. Be sure that any credit card information is transmitted in a secured, encrypted mode.

Credit card information is not the only personal information you should protect. Take the same precautions whenever you are asked to disclose anything personal, such as to market research companies. For example, avoid providing your telephone number on Web forms. It usually is not a required field even for online purchases. Disclose only what you think is legitimately necessary for the intended purpose. Do not provide personal information to unknown parties. Use code names when appropriate to protect your identity and personal security. See **Figure 30–8**.



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FIGURE 30–8 Secure card

Point-of-Sale Systems

VOCABULARY
point-of-sale (POS) system

A terminal used for electronic processing of payment transactions in a retail outlet is called a ***point-of-sale (POS) system***. When the cashier scans a product you purchase, the pricing comes from a centralized database thousands of miles away. If you use a frequent buyer card, the POS system might record information about your purchase so that you receive coupons or other promotions for similar items. Many of the POS systems include a complete accounting, inventory, and management system. See **Figure 30–9**.



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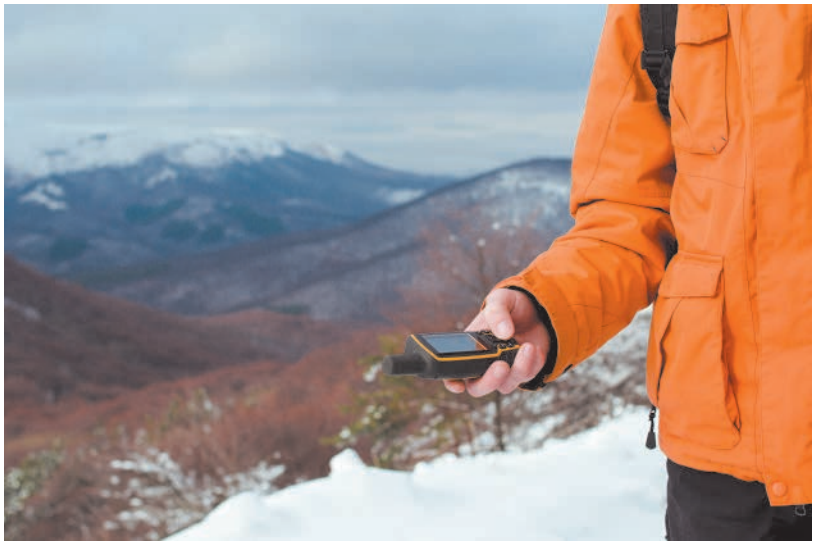
FIGURE 30–9 Point-of-sale system

Weather-Predicting and Reporting Systems

Several weather-prediction software tools are available. Numerical weather-prediction applications are used by most professional meteorologists. In most applications, the user can select the map output or the output statistics model option. The output statistics model allows the user to customize the output for particular locations. Devices and apps enable you to access real-time weather data and current and continuously updated weather forecasts.

Global Positioning Systems

A global positioning system (GPS), combined with cell phone technology, can provide location information and directions. A GPS can also be a communications device for a driver who needs help or has been in an accident. See **Figure 30–10**.



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FIGURE 30–10 Access to location information and directions

Embedded Computers in Appliances and Equipment

Though you might not see them, embedded computer systems play an important role in your daily life. An embedded computer is a special-purpose computer system incorporated into other devices such as automobiles, appliances, and mechanical equipment. Also defined as a single-purpose system, an embedded computer is designed to perform one or a few dedicated tasks within a device or appliance.

Newer cars, for example, have embedded computers that control systems such as ignition timing and antilock brakes. This is accomplished by using input from a number of built-in sensors. Cars are also available with built-in global positioning system (GPS) technology.

Almost every home has appliances with embedded computers. Any appliance that has a digital clock, for instance, has a small embedded microcontroller that displays the time. Other examples of appliances and mechanical devices with embedded computers are microwaves, refrigerators, DVR recorders, washing machines, and water pumps.

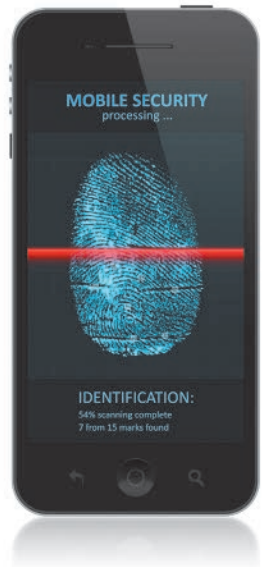
ABOVE AND BEYOND

Some high-end refrigerators include embedded computers to adjust defrost cycles to fit with usage patterns, regulate compartment temperatures, and control humidity levels.

Security Systems

Many cars today have a remote keyless ignition system. Pressing a button opens or locks the doors, while pressing another button starts the car. Keyless entry systems are also available for entrance doors to houses, businesses, and other buildings. Most of these systems include a keypad. To open the lock, you press a button on a remote control device or enter a combination on the keypad.

Some security systems require sophisticated user identification. For example, a biometric device can confirm or deny someone's identity by matching patterns stored in a database with a person's iris, retina, voice, fingerprint, or handprint. See **Figure 30–11**.



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FIGURE 30–11 Biometric fingerprint for identification

Using Technology to Transform Traditional Processes

The integration of personal computers and Internet services has transformed many of the traditional procedures and methods used in business, education, and government.

E-Commerce

VOCABULARY
e-commerce (electronic commerce)

The evolvement of the Internet economy is often compared to the Industrial Revolution. ***E-commerce*** (an abbreviation for ***electronic commerce***) means conducting business on the Internet. It primarily refers to purchasing and selling products or services on the Internet or through other computer networks. E-commerce is changing the way the world does business. Internet speed continues to increase as more people add fiber optics, cable modems, or digital subscriber lines (DSL). All of this activity and high-speed connection indicate there will be more online businesses in the future. See **Figure 30–12**.



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FIGURE 30–12 Online shopping

Commercial Web sites enable you to conduct business online. Using e-commerce, you can buy and sell just about any product over the Internet. Many people hesitate before making online purchases because they fear someone will steal their credit card numbers. However, most reputable e-commerce sites have strong encryption technology to protect personal information, such as pin codes and credit card numbers, allowing for safe purchasing transactions between the site and the buyer.

E-commerce also has generated a number of new jobs and new categories of jobs. Some examples include Webmasters, programmers, network managers, graphic designers, and Web developers. You might also consider starting an online business for yourself. People with imagination and ambition discover that their ideas are their greatest source of wealth.

Business Connections

Business-to-business (B2B) describes e-commerce transactions between businesses, such as between a company and a supplier. This includes the online exchange of products, services, or information. ***Business-to-consumer (B2C)*** describes online transactions between businesses and consumers. A third category is ***business-to-government (B2G)***, which describes online transactions between businesses and governmental agencies.

Retail businesses often use ***RFID (radio-frequency identification) tags***, which are small electronic devices used to improve the efficiency of inventory tracking and management. The RFID tags identify and track goods from the point of delivery or manufacturing to the point of sale. The RFID tags are similar to a bar code, but unlike bar codes, scanners can read information from RFID tags from several feet away. Governments are using RFID tags in passports and in transportation, such as electronic toll collection on highways and in mass transit passes.

VOCABULARY

business-to-business (B2B)

business-to-consumer (B2C)

business-to-government (B2G)

RFID (radio-frequency identification) tags

Media

In the past, the distribution of media was primarily through newspapers, magazines, television, and radio. The Internet opened a new category of communications media. Media can be distributed by anyone who has an Internet connection. Music, video, audio, pictures, and text can all be distributed online through e-mail, blogs, Web sites, and other types of Internet distribution channels such as the Cloud. See **Figure 30–13**.



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FIGURE 30–13 Sharing media

Online Learning

ABOVE AND BEYOND

Project Gutenberg was one of the earlier educational uses of the Internet that began as a text-based project by Michael Hart in 1971. Project Gutenberg was the first project and Web site to give away free electronic books. Thousands of books are available to download for free at *www.gutenberg.org*.

For some time, people have been able to obtain their education via distance learning methods. Earlier nontraditional methods include television and correspondence courses that are completed through the mail. Today, there are many opportunities for online learning. At the elementary and secondary school levels, the U.S. Department of Education supports an initiative called the Star Schools Program. This program provides online education to millions of learners annually. Many students in the program are able to complete their high school education requirements from home. Large numbers of students enroll in enrichment classes or complete a career-training program online.

Learning management system programs help teachers deliver online courses. These programs are an integrated set of Web-based teaching tools that enable teachers to deliver e-learning courses or training and administer, test, track, and report on student performance.

Robotics

When you think of robotics, you might think of humanoid robots such as C-3P0 in the movie *Star Wars*. In real life, however, robotic design did not originally take this path. Robots have transformed industrial processes. They are used mostly in assembly plants, often completing dangerous or repetitive tasks. The use of computerized robots on assembly lines and in other industrial processes has expanded production capabilities in the manufacturing world. Some automated systems are equipped with vision technology. Performance is precise, measurements are exact, and production is increased. Most manufacturing companies report that after they install automated systems, they realize a high return on investment. See **Figure 30–14**.



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FIGURE 30–14 Assembly line robots

ABOVE AND BEYOND

Honda Motor Company created a humanoid robot called Asimo that can walk, manipulate objects, recognize and respond to verbal commands, and based on multiple sensors, estimate changes that are taking place. *Go to http://world.honda.com/ASIMO* to see Asimo and learn more about Honda's robotics program.

More recently, some specialized robots have been developed to have a humanoid appearance. Robot devices such as NASA's Mars twin rovers *Spirit* and *Opportunity* allow exploration of hostile environments unsafe for humans.

Telecommuting

Many employers allow their employees to work from home. This arrangement is called ***telecommuting***. It involves using communications technology to keep the employee connected to the office. Telecommuting has many advantages for both the employer and the employee. The employer doesn't incur the overhead expenses for office space. For the employee it saves traveling time and commuting expenses, and it allows them to work at a time that fits their schedule. Projects and other relevant information can be shared through e-mail and other online distribution options. As with in-house employees, companies transfer telecommuting employees' pay directly to their bank account on a regular basis. Insurance and other employment-related activities are handled automatically online.

VOCABULARY

telecommuting

Online Communities

Online communities, also known as social networks, virtual communities, and e-communities, enable groups of people to interact online rather than face-to-face. Social and professional groups use this type of communication to exchange ideas around various topics and to share personal information. Facebook and Flickr were two of the earlier virtual communities. Some other popular social networks include Instagram, Yahoo! Groups, and Google Groups.

Disaster Recovery

Hurricanes, tornadoes, and other recent disasters have increased awareness of the need for disaster recovery planning for communities, cities, and states. The content of a disaster recovery plan and online resources will vary, based on the location and potential hazards. A segment of the plan, however, should include options for electronic communications, such as a Web site that is updated periodically, e-mail availability, and available resources and locations where help can be provided.

Identifying Assistive Technologies

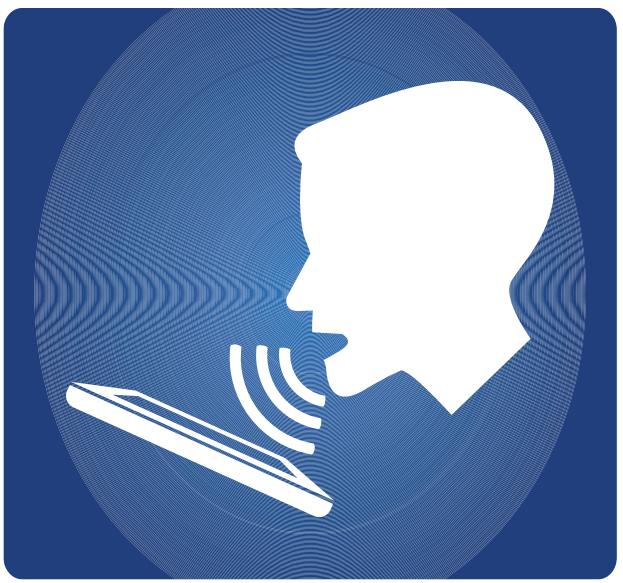
VOCABULARY
assistive technologies

Advances in technology assist us in many ways. ***Assistive technologies*** are software and devices used to maintain, increase, or improve the functional capabilities of individuals with disabilities.

Microsoft provides many options and settings in the operating system to make it easier for people of all ages and abilities to see, hear, and use their computers. For example, changing the keyboard and mouse settings can make it easier to type and control the mouse. Replacing sounds with visual clues can help those with hearing impairments.

Electronic software and devices help disabled people communicate, become more mobile, and participate in activities. For example, TDD (telecommunications device for the deaf) technology allows hearing-impaired people to use a telephone.

Several adaptive software options are available to aid people with vision impairment. These software options include screen readers that provide alternative sensory guidance for computer navigation. Scanning and reading software, Braille translators, and text-to-speech applications can be utilized to help people with vision challenges. Voice recognition tools enable you to dictate text and commands on computers and other electronic devices such as tablets and smart phones. See **Figure 30–15**.



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FIGURE 30–15 Smart phone activated by voice

It is sometimes difficult for the physically challenged to attend classes. E-learning and online courses are offered throughout the world by public and private educational institutions.

Assistive technology is not limited to computers. To make it easier for people with disabilities to board the bus, a "smart bus" provides steps that can be lowered, and it also has a lift for a wheelchair. Furthermore, personal computers offer accessibility options that permit people with many types of disabilities to work and communicate more easily.

TECHNOLOGY CAREERS

Simulation Analysts

A simulation analyst studies activities and procedures and makes recommendations for the most efficient solutions to meet both the business and technology needs of a company or organization. For example, a bank converting to a new system to process checks may hire a system analyst to evaluate the computer system. The system analyst must identify the technical and operational problems, develop solutions, and implement them.

A system analyst must be a logical thinker and have good analytical skills. The analyst must also have a solid understanding of computer hardware and software. Because businesses and organizations rely on computer systems, opportunities and the need for system analysts are increasing.

SUMMARY



In this lesson, you learned:

- Computers are used in different areas of work, school, and home to collect, organize, evaluate, and communicate information. Computers help users increase productivity, collaborate with others, facilitate learning, promote creativity, support critical thinking, and facilitate daily life.
- Desktop and laptop computers represent only a fraction of interaction with computer technology. Daily, we use automated teller machines, credit cards, automated industrial processes, point-of-sale systems, weather-predicting and reporting systems, global positioning systems, embedded computers in appliances and equipment, and security systems.
- The integration of personal computers and Internet services has transformed many of the traditional procedures and methods in business, education, and government. E-commerce, business connections, media, online learning, robotics, telecommuting, online communities, and disaster recovery are examples of how much has changed.
- Advances in technologies provide beneficial assistance for individuals with disabilities.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. Spreadsheets and databases are generally used only in a work environment.

T F 2. Many textbooks published today provide Web-based projects and supplemental material for the text.

T F 3. Using desktop and laptop computers represents the majority of your interactions with computer technology.

T F 4. Employees who work primarily on the telephone are called telecommuters.

T F 5. You can use spreadsheets to ask what-if questions and evaluate information.

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. A(n) _____ is a terminal used for electronic processing of payment transactions in a retail outlet.
2. _____ primarily refers to purchasing and selling products or services on the Internet or through other computer networks.
3. _____ are small electronic devices to improve the efficiency of inventory tracking and management.
4. _____ involves using communications technology to keep the employee connected to the office so that employees can work out of their homes or while traveling.
5. _____ are software and devices used to maintain, increase, or improve the functional capabilities of individuals with disabilities.

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. Why is it important to use critical thinking when reading information online?

2. What is the difference between a bar code and a RFID tag?

3. How does computer technology affect disaster recovery planning?

4. How have robots transformed industrial processes?

5. Why are biometrics used in security systems?

PROJECTS

PROJECT 30–1

1. Create a list of all the electronic devices you use for the following categories:
   - Collecting information
   - Organizing information
   - Evaluating information
   - Communicating information
   - Collaborating with others
   - Facilitating learning
   - Promoting creativity
2. Write a brief summary explaining which devices you like most, and explain why.
3. Submit your list and summary as directed by your instructor.

PROJECT 30–2

1. Create a list of common tasks you routinely perform at work or school each day. For example, at work you contact clients to schedule appointments, and at school you take notes during classroom discussions.
2. Add a check mark to each task in the list if you used computer technology to complete the task.
3. Answer the following questions:
   a. Do you depend on computer technology to complete the majority of your tasks?
   b. Do you think that computer technology makes you more productive?
   c. Do you trust the results you get from using computer technology?
   d. What effect has computer technology had on your communication skills?
   e. Has computer technology helped promote your creativity?
   f. If you had a choice, would you choose to not use computer technology?
4. Think about how you completed (or would have completed) those same tasks 2 or 3 years ago. Write a brief summary that describes how developments in technology have changed how you now complete those common tasks. Even if you used computer technology a few years ago, explain how the technology has changed.
5. Submit the document as directed by your instructor.

PROJECT 30–3

IC³ 3-6.1.1 3-6.1.2

1. Search the Web for government Web sites that provide information and services for your community or city.
2. Evaluate the Web site and write a review of the content provided on the Web site.
3. Comment on what you found to be the most helpful information for you in your daily life. Also identify what is missing from the Web site.
4. Cite your source(s).
5. Submit your review as directed by your instructor.

TEAMWORK PROJECT

IC³ 3-6.1.1 3-6.1.2

1. Search the Web for information about assistive technology services and devices available in or near your community, in your county, or in your state.
2. Create a list of at least 3–5 businesses or organizations that provide support. Be sure to save the URL or save the Web page as a favorite.
3. Compare your findings with a classmate.
4. Together, evaluate the validity of the Web pages and then compare the services offered.

CRITICAL THINKING

CRITICAL THINKING 30–1



3-6.1.1
3-6.1.2

Online shopping continues to grow, but some people still prefer to shop in stores.

1. Write a brief summary describing why you do, or do not, use B2C e-commerce.
2. Submit the summary as directed by your instructor.

CRITICAL THINKING 30–2



3-6.1.1
3-6.1.2

Which do you prefer, online learning or the traditional classroom environment?

1. Write a brief summary describing your preferences, and explain why.
2. Submit the summary as directed by your instructor.

ONLINE DISCOVERY

Most dentists today use computers in one way or another. For instance, instead of viewing a film of an x-ray, you can view it on a computer screen.

1. Search the Web to see what you can discover about how dentists are using computers.
2. Prepare a summary of your findings.
3. Submit the summary as directed by your instructor.



3-6.1.1
3-6.1.2

JOB SKILLS

As e-commerce continues to grow, the demand for Webmasters, programmers, network managers, graphic designers, and Web developers will also grow.

1. Choose one of the job titles listed, and search the Web to learn about the skills needed to meet the job requirements.
2. Write a brief summary including a job description and the necessary skills and education.
3. Submit the summary as directed by your instructor.



3-6.1.1
3-6.1.2

EXPLORE AND SOLVE

Many businesses and organizations use crowdsourcing platforms to complete tasks and solve problems. Governments also reach out to the public for solutions.

1. Search the Web and describe a current crowdsourcing platform for a city, state, or national government.
2. Write a brief summary about how you can participate in that crowdsourcing platform.
3. Submit the summary as directed by your instructor.



3-6.1.1
3-6.1.2



Estimated Time:
1 hour

LESSON 31

Computer Safety and Ethics

OBJECTIVES

Upon completion of this lesson, you should be able to:

- Identify security risks and protect data.
- Restrict access to devices and protect against viruses.
- Identify and disregard false information.
- Confirm e-commerce safety.
- Remove sensitive data from computers and devices.
- Protect your privacy on the Internet.
- Maintain a healthy computing environment.
- Explain why it is important to use computers legally and responsibly.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

Application Service Provider (ASP)
cookie
digital certificate
filtering
firewall
freeware
hardware firewall
Internet censorship
keylogger
logic bomb
malware
open source
phishing
private key
public domain software
public key
Secure Sockets Layer (SSL)
shareware
Software as a Service (SaaS)
software piracy
spyware
time bomb
Transport Layer Security (TLS)
Trojan horse
two-step verification
virus
worm

Microsoft product screenshots used with permission from Microsoft Corporation.

Using computers and the Internet offers unrivaled access to commerce, entertainment, and information, but it also exposes you to breaches in security, privacy, and ethics. Computer workstation environments can also be potential hazards. This lesson explores the measures you can take to minimize those risks.

Addressing Security Risks

You secure data in order to protect it from harm or destruction from natural causes, accidents, and intentional damage. It is not always evident that some type of computer crime or intrusion has occurred. Therefore, you need to set up safeguards for each type of risk. Computer security can keep hardware, software, and data safe.

Avoiding Data Loss

3-5.1.2

An example of an ever-present threat to a computer system is an electrical power failure. Electricity not only provides the power to operate a computer, but it is also the medium a computer uses to store data. An unexpected power outage can wipe out any data that has not been properly saved.

One easy way to avoid data loss is to save data files frequently. Most software programs provide an option that can be set to save data periodically. For instance, suppose you are working on a multi-page report. If your computer loses power and does not have battery backup power, you may lose all your work. However, if your application is set to save on a regular basis, such as every ten minutes, then you can retrieve at least a portion of your report.

To safeguard computer systems against power outages, install a battery backup supply to provide power in the event the normal current is interrupted. You should also use surge protectors to prevent hardware and software damage from power spikes.

Hard drives are mechanical devices, and they all fail eventually, preventing access to the data they store. A hard disk crash can result in a catastrophic loss of data if the files have not been backed up properly. To protect your data, you can back up important files to independent storage locations such as an external hard drive, the Cloud, or a flash drive. You can also subscribe to an online backup service for a minimal price.

Your backup procedures should be repeated regularly and should place a priority on files that would be difficult or impossible to replace or reconstruct if you lost them. Secure backup procedures used by large organizations include a regular schedule for backing up designated files and a means of storing backup files off-site so that they will remain intact if the main system is destroyed.

Restricting Access

The best way to protect data is to effectively control access to it. If unauthorized people gain access to data, they may obtain valuable information. System administrators and users often restrict access to files, storage devices, computers, networks, the Internet, or specific Internet sites.

Using Firewalls

3-5.1.1
3-5.1.2

Computer hacking involves invading someone else's computer, usually for personal gain or the satisfaction of defeating a security system. Hackers are usually computer experts who enjoy having the power to invade someone else's privacy. They can change or damage data stored on a computer, or they can use or sell the data. It is estimated that hacking causes billions of dollars of damage each year, along with the theft of important and valuable data.

A ***firewall*** protects against unwanted access or use to or from a network. The firewall analyzes data based on the specified security criteria. A firewall can be implemented in software or hardware. A personal firewall is generally installed with an operating system. For example, Windows 8 provides a firewall. If the network is small, a personal firewall is sufficient. Many routers contain firewall components. Using the personal firewall along with a router firewall reinforces the network security. However, if the network is large, a ***hardware firewall*** that controls all the computers from one point should be implemented. This type of firewall is more secure and requires expert setup.

VOCABULARY
firewall
hardware firewall

Firewalls are an essential part of making sure you are safe and secure when using the Internet. To access an unsecured wireless connection, a hacker needs only a computer and eavesdropping software to connect directly to an unsecured computer. Once connected, the intruder can scrutinize your computer for personal data such as user names, passwords, tax records, Social Security and credit card numbers, and other personal information. An unauthorized user could also tap into your network for illegal or criminal activity. If the unauthorized user is part of the network and is working behind a gateway device, any activity coming from the intruder could appear to be coming from your computer, meaning you could be held responsible for the illegal activity. It is good practice to frequently check to make sure the firewall is turned on.

Step-by-Step 31.1

1. Open the Start screen and then open the Control Panel.
2. In the Search box, type **firewall** and then press **Enter**.
3. Under the *Windows Firewall* category, click **Check firewall status**. A dialog box similar to the one shown in **Figure 31–1** will display.

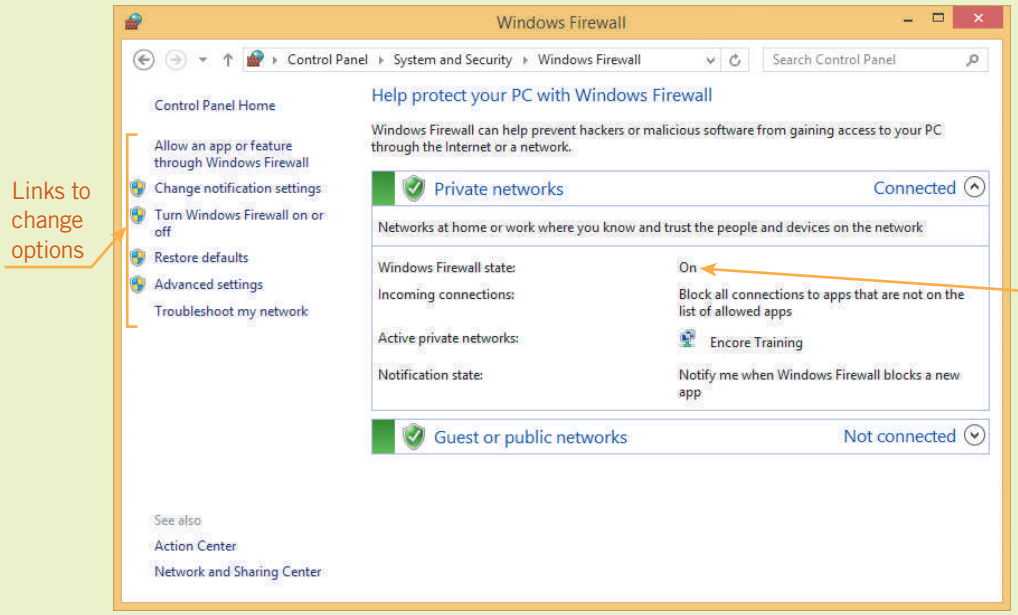


FIGURE 31–1
Windows Firewall status

4. You can use the links on the left side of the dialog box to change the firewall settings. Do not make any changes. Close the Windows Firewall dialog box.

3-5.1.1
3-5.1.2

Using Passwords

Almost all routers and access points have a factory-set administrator password, which is often a common word such as "password." Some devices do not have a default password at all. When setting up your network, your first step should be to change the default password and then write it down so that you can refer to it if needed. Second, turn on some form of encryption. Several forms of encryption technologies are available. You need to select the one that works best with your network devices. Turn off the network during extended periods when you are not using it.

Companies often establish password-protected locations on hard drives and networks so that designated users can access specific files. Web sites also require passwords to access account information or make transactions. For your personal computer, you can set a password to log on to the computer.

The challenge is to create strong passwords that are easy for you to remember but difficult for anyone else to decipher. A strong password is both complex and secure—it contains numbers, letters, and special characters that do not include personal information such as a name or birth date. In addition, strong passwords contain at least eight characters, and at least one letter, number, and special character (such as @, $, *, or !). Also, using upper and lowercase letters makes the password even more complex.

Microsoft provides a password checker that you can use to evaluate the strength of a password. See **Figure 31–2**. Go to https://www.microsoft.com/security/pc-security/password-checker.aspx.

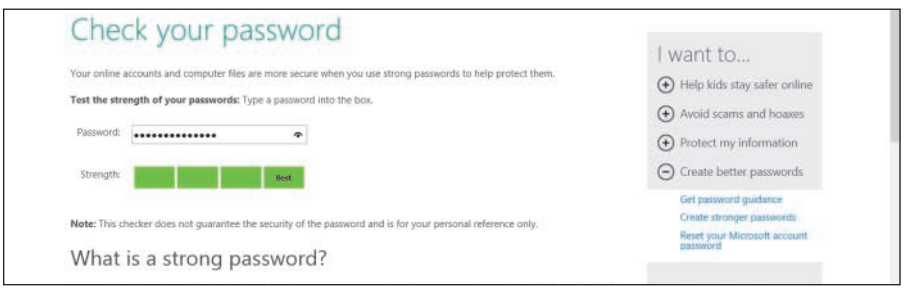


FIGURE 31–2 Check password strength

If you are currently using weak passwords, you should create new, strong passwords as soon as possible. If you've just experienced a breach in security, change your passwords immediately. In some cases, it is recommended that you should change your passwords on a regular basis. For example, corporate login passwords are changed frequently because employee positions continuously change, thereby changing who should have access to specific files. Hackers often stalk your e-mail messages for an extended period of time to get sensitive information from you, so it is recommended that you change e-mail passwords frequently.

VOCABULARY
two-step verification

Passwords for two-step verifications do not need to be changed as often because the second step adds an additional layer of security. ***Two-step verifications*** require more information than a password to authenticate your identity. For example, when you log in to an online account, the first step is to enter a username and password. The second step is to enter a PIN number or a security passcode. Many online services support two-factor authentication, including Facebook, Google Mail, and Yahoo! Mail. You can enable the security option in Facebook to require a security code when your account is accessed by a computer or phone that is not recognized.

If you write down a password, keep it in a secure place and do not share it with anyone else. Unauthorized access is much more likely to be caused by people who gain access through a written or shared password than by anyone guessing your user name and password.

Using Protection Programs

3-4.2.2
3-5.1.1
3-5.1.2

Software programs and computer utilities enable you to control Internet use and monitor computer usage.

Internet services such as e-mail and file transfers can be blocked for specific users or for all users. Furthermore, access to Web sites can be blocked. Protecting children from unsuitable Web sites is a concern for parents, teachers, libraries, and other areas where children have computer access. ***Filtering*** is used to block content coming into and going out to the Internet. For example, a browser filter will block a Web page when a forbidden word is matched in the Web page content. E-mail filters inspect incoming and outgoing mail. See **Figure 31–3**.

VOCABULARY
filtering



pau2000/Shutterstock.com

FIGURE 31–3 Internet filtering

The benefit of using filtering is that the accessible Web sites are safe and e-mails are inspected for spam and viruses. In an education environment, using filtering means children cannot access inappropriate Web sites. In the workplace, filtering ensures that employees cannot use company computers for personal use. There are also some drawbacks. Search results on the Web are limited, and a site with valuable information may be blocked. Also, important e-mail messages may not be delivered.

Monitoring computer usage can assure that students are using computers safely and appropriately. Parental control software enables parents to track their children's computer activity and block access to Web sites. By monitoring their activity, parents can make sure their children don't overshare information that would compromise their safety.

Many businesses monitor the computer activity of their employees. Obviously, businesses might track the computer activity to assess productivity by documenting the amount of time the employee spends on the computer. However, businesses also monitor computer activity for security purposes. Employees can either inadvertently or intentionally jeopardize a business by revealing sensitive information. For example, competition among companies for a government contract or a bid on new business can encourage some employees to overshare information with competitors. Malicious tampering can also result in data loss. A disgruntled employee can willfully delete vital records and other important data.

3-5.1.2

Protecting Against Malware

In an information-driven world, people and organizations must manage and protect against malware risks. ***Malware*** refers to any software that is designed to cause damage to a single computer, server, or computer network. See **Figure 31–4**.

VOCABULARY

malware
virus
worm
time bomb
logic bomb
Trojan horse
keylogger



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FIGURE 31–4 Malware

A ***virus*** is a program that has been written, usually by a hacker, to corrupt data on a computer. Often, you can inadvertently run the virus program by opening an e-mail message or attachment. The virus is attached to a file such as a program file, a document, or the e-mail message, and it spreads from one file to another when the program is executed. A virus can do something as minor as display messages on your screen, or it can cause major damage to the computer data. There are several types of viruses.

- A ***worm*** virus makes many copies of itself, consuming system resources so that the computer slows down or actually halts tasks. Worms don't have to attach themselves to other files.
- A ***time bomb*** is a virus that does not cause damage until a specified date or until the system has been launched a certain number of times.
- A ***logic bomb*** is a virus triggered by the appearance or disappearance of specified data.
- A ***Trojan horse*** is a virus that does something different from what it is expected to do. It may look like it is performing one task while it is actually performing an opposite task (usually something disastrous).

A ***keylogger*** is a malicious program that records keystrokes. For example, a keylogger might record your keystrokes to keep track of the Web sites you visit, the user names and passwords you enter, and your private information such as credit card and account numbers. Because they can aid identity theft, keyloggers are a particularly dangerous type of harmful software.

Spyware is software fraudulently installed on a personal computer. The goal is to collect information about the user, the user's browsing habits, and other personal information. Spyware can significantly slow the performance of your computer, display annoying pop-up ads, and change system settings. Spyware can be harmful as well as annoying. Hackers often use spyware to control your browser. The spyware might replace your home page with another, often to increase the number of visits to the replacement page, which can boost advertising revenue. Antispyware software is available, but make sure you use reputable antispyware programs—some spyware disguises itself as antispyware to gain access to your system.

Protecting a system requires a number of security tools. You should use strong passwords and download and install the latest security updates for your operating system. Antivirus software should always be running on your computer, and the software should be updated regularly. Many programs have settings to automatically update, or notifications that tell you when it is time for a manual update.

VOCABULARY
spyware

WARNING

Although they appear to be harmless, many free programs that you download via the Internet are malicious. They monitor your keystrokes and track your Internet logins. Some of these programs install on your device when you click an ad or an Internet link.

IC3
3-5.1.1

Disregarding False Information

Electronic fraud, such as e-mail fraud, is a computer crime that involves the manipulation of a computer or computer data to dishonestly obtain money, property, information, or other things of value, or to cause loss. The U.S. Secret Service reports that hundreds of millions of dollars are lost annually due to fraudulent activities. See **Figure 31–5**.



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FIGURE 31–5 Internet fraud

E-mail messages are often used for fraudulent activities. Beware of messages you receive from e-mail addresses or senders you do not recognize. In many instances, the messages are well-written and appear to be legitimate. Typically, the messages request money for one reason or another. Unless you know the reason to be true, do not send a response to a message that requests money or personal information.

A hoax is an attempt to deceive an audience into believing that something false is real. Sometimes a hoax takes the form of a practical joke with a humorous intent; other times, it is an attempt to defraud and mislead. Many e-mail hoaxes are passed along in electronic chain letters and appear to be warnings about potential computer viruses, but the e-messages actually contain a virus themselves.

QUICK TIP

The FBI has a cybercrime branch that concentrates in particular on Internet fraud, including identity theft. See www.fbi.gov/about-us/investigate/cyber/cyber for more information.

It is not always easy to spot an e-mail or chain letter containing a virus, but looking for some of the following hallmarks helps detect possible harmful files. If you identify any of these characteristics, it is wise to delete the e-mail immediately.

- The e-mail is a warning message about a virus.
- The message might be very wordy, contain all capital letters, or include dozens of exclamation marks.
- The message urges you to share information with everyone you know.
- The message appears credible because it describes the virus in technical terms.
- The message comes with an attachment, and you do not know who it is from.

VOCABULARY

phishing

Phishing is a fraudulent attempt to steal personal information to commit identity theft. This type of message appears to come from a legitimate source, such as your bank, an auction site, or the IRS. The message asks that you click a link in the e-mail message to update or verify your personal information. When you click the link, you are directed to a bogus Web site, one that disguises its URL so it looks like you are visiting a legitimate Web site.

Also be suspicious of messages that solicit private information (such as a Social Security number or an account number) to verify your account. Messages like these appear to be from legitimate companies, but they are usually fraudulent scams for identity theft. Most companies assure customers that they would never ask for sensitive information in an e-mail, so do not respond to these e-mails. Do not click on links in these e-mails because they may direct you to a bogus Web site run by a con artist, or they may download malicious files to your computer. If you have questions or want to report fraud, go directly to the Web site by entering the URL in the Address bar or contact the company by phone.

QUICK TIP

You can enable settings in your e-mail program to encrypt messages. Encrypting an e-mail message requires that you obtain a digital signature from a Certificate Authority.

Nearly all e-mail programs provide security settings, phishing filters, encryption, and spam filters. It is important that you enable these options so you don't become a victim to scams and identity theft.

IC3
3-5.1.1

Confirming E-Commerce Safety

A common security concern is providing credit card information over the Internet. Before providing personal information or credit card information on an e-commerce or similar site, first verify that the site is secure.

Web sites used for financial transactions or e-commerce usually use encrypted communication to make them more secure. Before you make a financial transaction online, you need to confirm that you have a secure and encrypted connection. Most secure Web sites require you to log on using an account or user name and a password. After you log on to your account, you might see a message indicating that you are now entering (or leaving) a secure Web address. In the Address bar, the URL should begin with "https" rather than "http." The letter "s" indicates that the Web site is secure. You should also see a padlock icon in the Address bar. See **Figure 31–6**.



FIGURE 31–6 Secure Web site

Transport Layer Security (TLS) technology and its predecessor ***Secure Sockets Layer (SSL)*** technology encrypt sensitive information and authenticate servers and clients to ensure a secure connection. The differences are minor. TLS uses stronger encryption algorithms and has the ability to work on different ports. TLS and SSL use public key encryption to authenticate the server to the client. The public key encryption system works like a lock and a key. The ***public key*** encrypts information and the ***private key*** deciphers the information. A ***digital certificate*** is an electronic document that verifies the identity of a person or company and confirms that they own a public key. TLS and SSL use certificate authorities to confirm that the certificate comes from a trusted party, the certificate is currently valid, and that the certificate has a relationship with the site from which it comes.

When you click the padlock icon in the Address bar, information about the identity of the Web site is provided. As shown in **Figure 31–7**, the information confirms that the connection to the server is encrypted. You can click the *View certificates* link for information about a digital certificate.

VOCABULARY

Transport Layer Security (TLS)

Secure Sockets Layer (SSL)

public key

private key

digital certificate

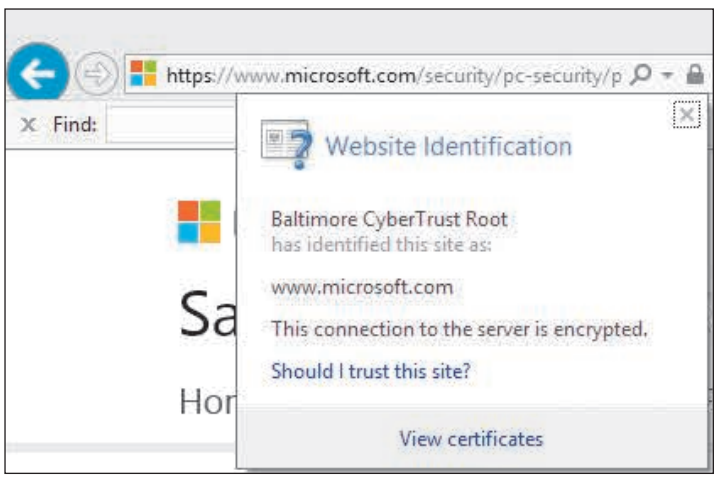


FIGURE 31–7 Digital certificate

Follow these guidelines when you provide information at an e-commerce Web site:

- Use a PC that you know is secure.
- Make sure firewalls and anti-virus software features are enabled.
- Make purchases from Web sites that you know are reputable and trustworthy.
- Verify that any credit card information is transmitted in a secured, encrypted mode.
- Before you provide any personal or financial information to a Web site, look for and read the site's privacy policy. A link to the privacy policy is often listed at the bottom of the home page.
- Make sure that you log off from the Web site at the end of the session.

Removing Sensitive Data from Devices

IC3 3-5.1.2

Before you sell, donate, recycle, or dispose of electronic devices, be sure to back up your data. If you are using a mobile device, most of your data is likely synchronized with online services. And just as important, don't forget to remove the sensitive data to prevent unauthorized retrieval and use of the information.

Moving files into the device's trash folder and then emptying the trash folder removes only the records of the files. Residual files are left on hard drives, flash drives, and portable drives, and the data can still be recovered. You can hire a professional to wipe the data, or you can remove the data yourself. You can also look for information at the manufacturer's Web site about advice for removing data from a device.

To fully wipe data from a computer, you can reformat the hard drive or you can reinstall the operating system. If you have a traditional magnetic hard drive, reformatting it and reinstalling the operating system won't erase every sector of the disk. You can use programs specifically designed to remove data, such as Eraser for Windows or Permanent Eraser for MacIntosh. These programs write over each sector multiple times to ensure that the data is completely removed.

The Reset Your PC feature is available on computers running Windows 8. The feature erases your entire device and resets Windows back to its factory default state. If your computer is running Windows 8, you can use the Reset Your PC feature to set Windows back to its factory default state. If your computer has a magnetic hard drive, be sure to select the "Fully clean the drive" option.

Step-by-Step 31.2

1. Show the Charms bar. Click **Settings** and then click **Change PC settings**.
2. In the left pane, click **Update and recovery**, and then click **Recovery**.
3. Your screen should be similar to **Figure 31–8** (colors may vary). Under *Remove everything and reinstall Windows*, you would click the Get started button and then follow the steps. Note that you can also choose options here to update Windows or file history.

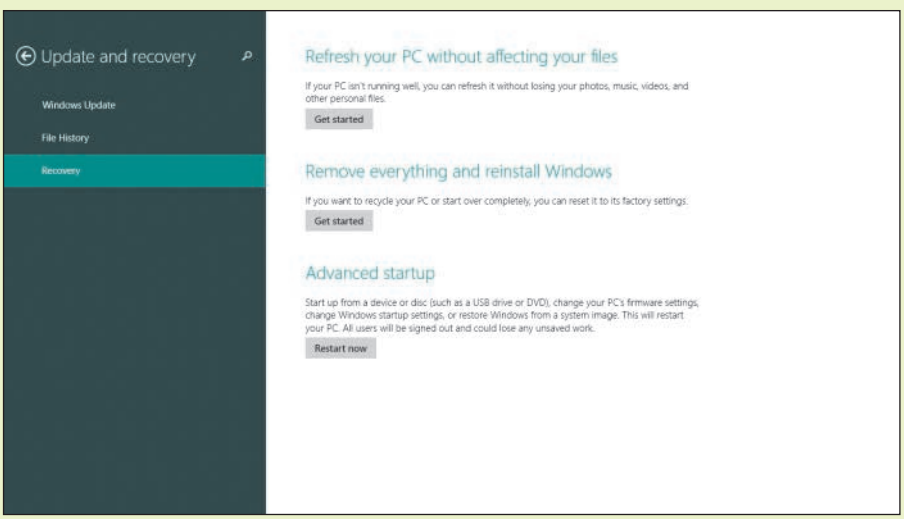


FIGURE 31–8
Update and Recovery options

4. Do not make any changes. Press **ALT+F4** to close the dialog box.

If you do not trust that all the data has been removed from a hard drive, remove the drive and destroy it. For example, hit it with a hammer to break it into pieces. See **Figure 31–9**. Data cannot be fully removed from flash drives. To extinguish the data, destroy the flash drive.



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FIGURE 31–9 Destroy data

Portable devices such as notebooks and tablets also contain your personal identity information. To remove the data, use the Factory Reset option.

The Subscriber Identity Module (SIM) card for your mobile phone holds your personal identity information and also cell phone numbers, text messages, and the (SD) card stores data such as photos and music. The easiest way to fully wipe data from a smart phone is to remove the SIM and SD cards. If you must leave the cards with the phone when you exchange the phone, check your manufacturer's Web site for information about how to fully wipe the data from the cards.

ABOVE AND BEYOND

Electrical and electronic waste (eWaste) is the fastest growing type of waste. It is hazardous waste, and endangers human health and the environment. Electronic devices need to be recycled responsibly so that they do not end up in landfills.

Protecting Privacy on the Internet

IC3 3-5.1.2

The amount of personal information available online for the average computer user is astonishing. The major source of revenue for some companies comes from gathering information about consumers and other computer users to create databases and sell or trade this information to others.

Any time you submit information on the Internet, it is possible for this information to be gathered by many persons and used for various situations. Information can also be gathered from online data regarding school, banking, hospitals, insurance, and any other information supplied for such everyday activities.

Much of the information gathered and sold results in your name being added to mailing lists. These lists are used by companies for marketing purposes. Junk e-mails are used for the same purpose. Information regarding one's credit history is also available to be sold.

VOCABULARY

cookie

A ***cookie*** is a small text file that a Web site's server puts on your computer to store information about you and your preferences. When you revisit the Web site, the Web server can retrieve the information and display any preferences or other customized settings you selected, such as user names, passwords or items stored in a shopping cart. Cookies may make it easier for you to use the Web site when you return, but they may also provide the Web site owner with information about you and your computer. Some Web sites use cookies to track your computer use, which many consider to be an invasion of privacy. You need to balance the ease of use provided by cookies with security concerns. For example, you might get a prompt to allow cookies when attempting to open a Web page you need to view because allowing cookies is the only way to view that site. It's up to you to decide which sites are the most secure and safest to use.

For the most part, the default settings for cookies and stored pages are appropriate for most Internet users, but you can choose to not allow cookies. Or, you can customize settings to block specific Web sites.

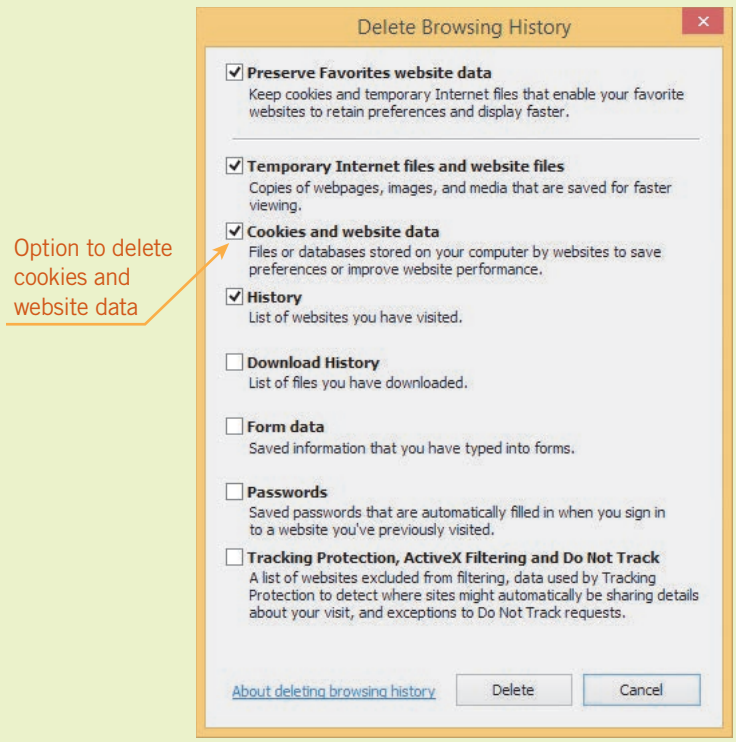
Cookies can slow down your computer because every time you access a Web site, it takes time to download the cookie files. Therefore, it's a good idea to periodically clean up the unnecessary cookies on your computer.

The following steps provide directions for removing cookies using the Internet Explorer 11 browser.

Step-by-Step 31.3

1. If necessary, open your Web browser.
2. If your browser is open in Desktop mode, go to Step 3. If your browser is open in Windows 8 mode, click the **Tools** button and then click **View in the desktop**.
3. In Desktop mode, complete the following steps.
   a. Click the **Tools** button on the browser's menu bar and then click **Internet options**. The Internet Options dialog box opens.
   b. Under *Browsing history*, click the **Delete** button. The Delete Browsing History dialog box opens, similar to the one shown in **Figure 31–10**.

FIGURE 31–10
Delete Browsing History dialog box



4. To delete all cookies, you would enable the Cookies and website data option and then click the Delete button at the bottom of the dialog box. Do not make any changes. Close the dialog box.

Even though security and privacy of personal information on the Internet is improving, it is still necessary to take precautions to protect both personal and business-related information. To protect your privacy online, follow these guidelines:

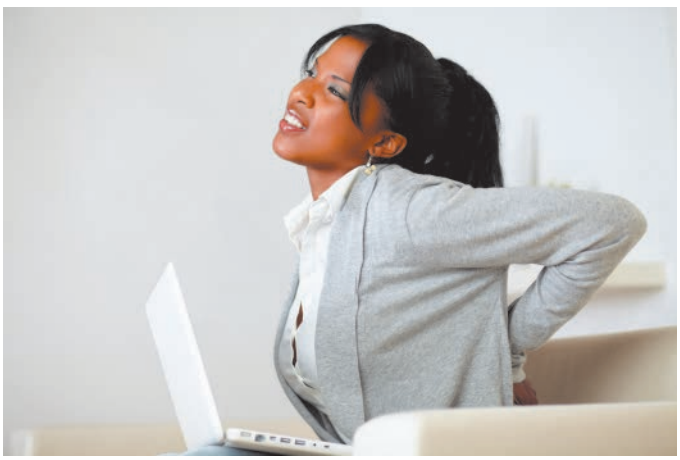
- Keep your operating system updated.
- Use code names instead of real names. This also applies to protecting personal or family information in public places as well.
- When communicating on a forum, blog, social network, or other similar Internet-related sites, use an alias.
- Verify that you have logged off a computer used in a public place such as a hotel, public library, a school, or other similar institutions.
- Monitor your credit reports and check your credit history at least once a year.

Maintaining a Healthy Computing Environment

IC3
3-5.2.1
3-5.2.2
3-5.2.3
3-5.2.4
3-5.2.5

Maintaining a proper workspace not only affects your productivity, but it is also critical for both short-term and long-term health. Make sure you use a computer in a way that supports your comfort, health, and safety. Whether you use a desktop computer provided by your school or other organization, a notebook computer at home or in an outdoor café, or a smart phone when you are on the go, pay attention to your posture, lighting, and activity level.

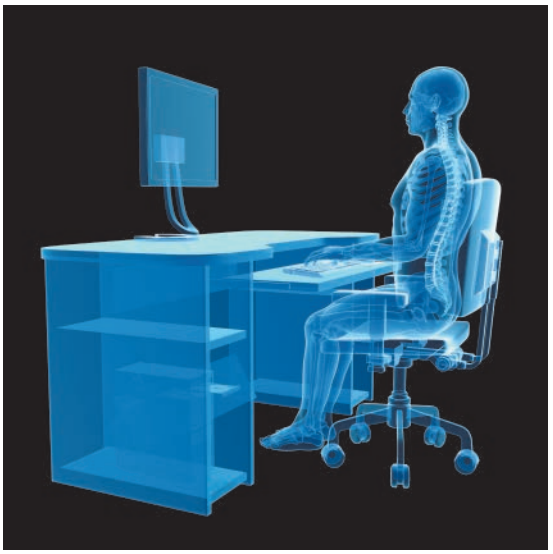
Equipment, tools, furniture, and the visual demands of working at a computer all have a direct effect on posture. The physical arrangement of hardware and supplies can cause poor body posture, which can cause chronic physical conditions such as headaches, aching muscles, and back pain. See **Figure 31–11**.



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FIGURE 31–11 Aching muscles

When you use a computer, take precautions to avoid chronic physical maladies such as repetitive motion injuries, eyestrain, and back problems that can arise over time. Ergonomic design adapts equipment and the workplace to fit the worker. A computer workstation should be adjusted to fit the needs of the user, and working postures will differ from one employee to another. For optimal comfort and safety, arrange the computer workstation so that the user can work comfortably. See **Figure 31–12**.



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FIGURE 31–12 Correct posture

- The desk or work surface should be an appropriate height, whether the user is sitting or standing. An adjustable height desk allows you to raise and lower the work surface and monitor, enabling users to switch between sitting and standing throughout the day. There should be enough space on the work surface so that the computer, keyboard, and pointing device are all within easy reach.
- When sitting at a workstation, use a chair that can be adjusted to match the user's height. When sitting in the chair, knees should be positioned at the same level or lower than the hips. The chair should also provide back support to reduce stress on the lower back. Adjustable and padded armrests help prevent neck and shoulder pain.
- If possible, use a keyboard tray so that the keyboard and mouse can be centered directly in front of the user. A keyboard tray provides a comfortable level and minimizes the strain on the shoulders. Ergonomic keyboards and mice provide natural angles and curves that help you rest your wrists and palms and minimize repetitive strain injuries such as carpal tunnel pressure.
- There must be adequate space for feet and legs under the work surface so the user can sit with appropriate posture. If possible, provide a foot rest to reduce pressure on the lower back.
- Staring at a computer screen can cause short-term eye strain and long-term vision problems. The distance between the user and the monitor should be at least 20 inches (or arm's length). Larger monitors can be positioned further away. The best angle is to position the monitor directly in front of the user, with the top of the monitor positioned at eye level, or just below. If the monitor is too high, the user will work with their head, neck, and shoulders tilted back, which will cause muscle strain. Overhead lighting should be dim. Be sure the workstation is positioned so that sunlight does not cause glare on a computer screen, which causes users to squint and sit in awkward positions. Computer eyewear can reduce the glare and increase the contrast.

QUICK TIP

Users who wear bifocals may need to position the monitor lower and tilt the monitor upward slightly to avoid having to tilt their head backward.

Sitting in the same position for long periods of time causes muscle fatigue and discomfort. Maintaining good posture and changing positions throughout the day are effective ways to minimize stress and strain on the muscles. Be sure to change your position often. For example, stand up and walk around for a few minutes and stretch your fingers, hands, arms, and torso. Also, take regular breaks to allow your eye muscles to relax.

Using a notebook computer introduces risks not associated with desktop computers. Avoid setting a notebook computer directly on your lap or on a soft, flexible surface such as a cushion, which might obstruct air vents and cause the computer to overheat. Use a cooling pad to keep air flowing around the notebook and the battery or AC adapter.

Tablet PCs are light and portable, which allows users to change position frequently. If buttons and other controls are easy to access with natural hand and finger movements, tablet users can also avoid computer-related injuries. Some tablet users, however, use poor posture when typing on a tablet, which puts them at risk for neck and shoulder pain.

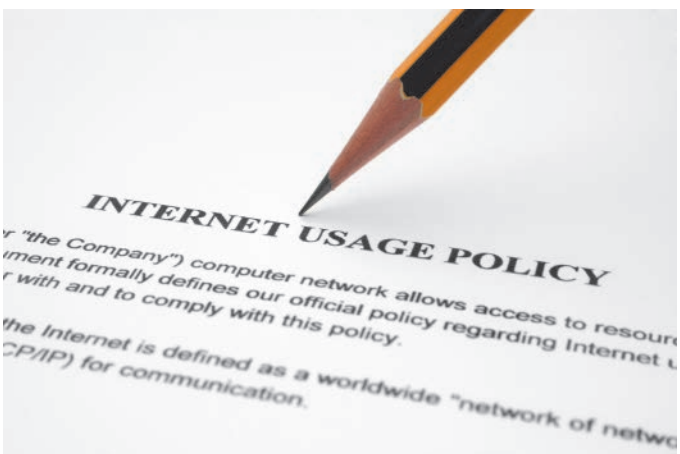
Using Computers and Devices Responsibly

IC3
3-4.2.1
3-5.2.4
3-5.2.5

Certain responsibilities govern your use of computers, devices, and online services, including following guidelines and policies, exercising ethical behavior, and respecting copyright laws.

Complying with Guidelines and Policies

When you are using a computer owned by a school or other organization, follow the organization's guidelines for electronic communications. Nearly all schools, government agencies, companies, libraries, and other similar institutions have written policies and guidelines for using the systems ethically, professionally, and legally. These policies protect the organization as well as the user. Before you access the Internet, send e-mail, exchange files, or otherwise use a computer at school or work, make sure you are familiar with the usage policies. If these policies are not readily available, ask a system administrator or other employee for a copy of the policy. See **Figure 31–13**.



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FIGURE 31–13 Rules for Internet usage

If you use a company computer, the information you send and receive is the company's property. Generally, any information gathered from a company's computer system is company property and not an individual worker's personal property. Likewise, the same laws apply to educational institutions. Any information stored on a computer in an educational facility is school property. The organization has a right to access any data on their computers and monitor activity including the usage of applications, Web history, and more. Companies can also use portable devices to monitor text messages and GPS locations. The employee/student normally has no right to personal privacy regarding those issues.

VOCABULARY

Internet censorship

software piracy

Internet censorship is the suppression of Web content that is considered offensive or a threat to security. The government censors the content published on the Web to protect citizens and businesses. However, there are debates about whether the censorship of the Internet violates human rights for freedom of speech.

3-5.1.1

Exercising Ethical Behavior

When using information technology, ethical behavior goes beyond following guidelines and legal requirements. Ethical behavior is proper behavior. When making decisions, not only should you follow the rules, but you should also consider how your actions will affect individuals. Respecting the rights and privacy of others is important, both online and offline.

Identity theft is an example of unethical behavior. There may be some short-term rewards for those who commit identity theft; however, there are also some long-term consequences when convicted of a felony crime. The impact on victims can be very devastating. Not only do victims often suffer from financial damages, they also suffer from anxiety and frustration, and sometimes there are criminal ramifications that need to be resolved.

3-4.2.3
3-4.2.4
3-4.2.5
3-4.2.6

Using Software Legally

It is also your responsibility to respect copyright law. Software must be legitimately licensed before it can be used, and there are different ways software can be distributed and licensed. In organizations, it is the system administrator's responsibility to install and use only legitimately licensed software. Users of personal computers are also responsible for installing and staying informed about licensed programs and downloading valid software.

Software piracy is the unlawful reproduction and/or distribution of any copyrighted digital files including videos, music, e-books, and software. Piracy is stealing. It is easy to download or copy files. See **Figure 31–14**. Even though you will likely not get caught stealing the files, it is still an unethical use of technology. To respect copyrights and do what is right, you should pay for retail software and obey the terms and conditions for using all software programs.



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FIGURE 31–14 Downloading software

During the installation process, users are often asked to accept a contract of agreement, sometimes referred to as the End User License Agreement. Traditional licenses apply to a single user with a physical device. Network licensing allows a business or organization to install the software on more than one computer or device. The benefits of network licensing include reduced costs and the ability to share resources. For example, a site license may permit up to 12 users to access software via a network and at the same time. Therefore, the software does not need to be installed on every computer or device. When accessing software via a network, Intranet, or the Internet, users must normally log in with a user name and password.

Software licensing differs among types of software. There are alternative methods of distributing and licensing software beyond traditional purchasing. Retail software is produced for sale and for profit. Free software is often bundled with hardware purchases, and there are also free software programs that you can download from the Internet.

- ***Public domain software*** belongs to the public, so the software licensing has no restrictions.
- ***Freeware*** programs allow you to download and use the software at no cost, or for a voluntary fee. The license generally has a few restrictions. The creator of the software retains the copyright, and the license usually allows unlimited copying and distribution but forbids any changes to the program.
- ***Shareware*** programs are initially available for free trial for a specified period of time. Shareware provides an opportunity for users to try the software before they buy it. The license generally requires that users pay a fee for continued use.
- ***Open source*** programs refers to software in which the source code is available free of charge to the general public for use and/or modification. Programmers typically develop the software in a public and collaborative manner. Licenses normally give end-users the right to use, copy, modify, and distribute the programs.
- The use of ***Software as a Service (SaaS)*** and ***Application Service Provider (ASP)*** is growing. SaaS and ASP provide remote access to software applications hosted on the Internet. Instead of acquiring licenses and installing software, users can use SaaS and ASP to remotely access software applications via a Web browser. Webmail and SkyDrive are common examples. Often advertisers pay for the service, so the user gets the service for free. Licenses normally restrict usage and require you to register and log in with a user name and a password.

VOCABULARY

public domain software

freeware

shareware

open source

Software as a Service (SaaS)

Application Service Provider (ASP)

When downloading and installing software, regardless of the type of software, make sure you access the files from authorized sources, that you have valid software licenses, and that you use the software responsibly as specified in the contract of agreement.

ETHICS IN TECHNOLOGY

Physical Security

In addition to protecting data, users should also take steps to secure their computer hardware. It is generally fairly easy for an unauthorized person to steal a computer or device from a user's desk or in a public environment. Locks are available to secure most desktop computers and laptops. Portable devices such as laptops, tablets, and smart phones are especially vulnerable to theft. All devices should require a password for a log-in. Never leave your device unattended, even in your office setting. When you leave your office for a meeting or a lunch break, lock portable devices and flash drives in a desk drawer.

SUMMARY

In this lesson, you learned:

- The best way to protect data is to effectively control access to it. System administrators and users often restrict access to files, storage devices, various computers, networks, the Internet, or specific Internet sites.
- Strong passwords are both complex and secure. The challenge is to create strong passwords that are easy for you to remember but difficult for anyone else to decipher.
- Software programs and computer utilities enable you to control Internet use and monitor computer usage.
- It is important to watch for hallmarks of false information or hoaxes in e-mail messages as well as characteristics of possible harmful files.
- Protecting a system against malware risks requires a number of security tools. Electronic fraud is a computer crime that involves the manipulation of a computer or computer data.
- Before providing personal information or credit card information on an e-commerce or similar site, first verify that the site is secure.
- Before you sell, donate, recycle, or dispose of electronic devices, be sure to remove the sensitive data to prevent unauthorized retrieval and use of the information.
- Any time you submit information on the Internet, it is possible for this information to be gathered and sold or traded to others.
- Maintaining a proper workspace not only affects your productivity, but it is also critical for both short-term and long-term health. Make sure you use a computer in a way that supports your comfort, health, and safety.
- Following guidelines and policies, exercising ethical behavior, and respecting copyright laws govern your use of computers, devices, and online services.

LESSON REVIEW

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. A personal firewall is generally installed as an add-in program.

T F 2. Filtering is used to block content coming into and going out to the Internet.

T F 3. Cookies can slow down your computer.

T F 4. Residual files are left on flash drives, and the data can still be recovered.

T F 5. Network licensing allows a business or organization to install the software on more than one computer or device.

MULTIPLE CHOICE

Select the best response for the following statements:

1. A _____ is a virus that does something different from what it is expected to do.
   A. worm
   B. time bomb
   C. Trojan horse
   D. logic bomb
2. _____ refers to any software that is designed to cause damage to a single computer, server, or computer network.
   A. Spyware
   B. Malware
   C. Phishing
   D. none of the above
3. _____ programs are initially available for free trial for a specified period of time, and the license generally requires that users pay a fee for continued use.
   A. Shareware
   B. Open source
   C. Freeware
   D. Software as a Service (SaaS)
4. To protect your privacy online, _____.
   A. keep your operating system updated
   B. use a code name
   C. check your credit history
   D. all of the above
5. When sitting in a chair at a computer workstation, knees should be positioned _____ the hips.
   A. at the same level as
   B. lower than
   C. slightly above
   D. A or B

WRITTEN QUESTIONS

Write a brief answer to the following questions.

1. What kind of data does a keylogger program steal?

2. What is a two-step verification?

3. What are the drawbacks of using filtering?

4. How can you confirm that an e-commerce Web site is secure?

5. What is the purpose of the Transport Layer Security (TLS) and Secure Sockets Layer (SSL) technologies?

PROJECTS

PROJECT 31–1

3-4.2.2
3-5.1.1
3-5.1.2

1. Navigate to the security settings in the program you use to access your e-mail messages, and check to see if the following settings are available and enabled. If you are using a public computer, do not make any changes to the settings.
   - Encryption
   - Phishing filters
   - Spam filters
2. Navigate to the security settings in your operating system, and check to see if the following settings are available and enabled. If you are using a public computer, do not make any changes to the settings.
   - Antivirus software
   - Antispyware software

PROJECT 31–2

3-5.1.2

1. Create a list of examples of when cookies have been good for your browsing experience.
2. Create a second list of examples of when cookies have been a bad experience.
3. Describe how you can protect yourself from the negative experiences in the future.
4. Submit your lists as directed by your instructor.

PROJECT 31–3

1. Search online for guidelines/policies for computer and Internet use at a public library in your area.
2. Review the guidelines and then answer the following questions:
   - Which rules do you think are the most important and why?
   - Which rules do you think are the least important and why?
   - Are you comfortable with the guidelines, and would you consider using a public computer at this library? Explain your answer.
3. Cite the Web site addresses for your source of information.
4. Submit your answers as directed by your instructor.

TEAMWORK PROJECT

3-5.2.1
3-5.2.2
3-5.2.3
3-5.2.4
3-5.2.5

Choose a partner with whom you can discuss and evaluate your posture and workspace setup.

1. Set up a typical setting for how you work on a computer. For example, sit at a desk, or sit in a chair and use your laptop or tablet without a desk surface.
2. Ask your partner to observe your posture and workspace setup, specifically looking at the following elements:
   - work surface space and height
   - placement of the keyboard and mouse
   - placement of items that you generally access, such as text books or a calculator
   - position and angle of the monitor
   - screen resolution and lighting in the area
3. Discuss with your partner how you can improve your posture and create a more comfortable and healthy workspace.
4. Switch roles and observe and discuss changes to improve your partner's posture and workspace setup.

CRITICAL THINKING

CRITICAL THINKING 31–1

How can posting photographs online lead to privacy concerns?

1. Write a brief summary to respond to the question.
2. Submit the summary as requested by your instructor.

CRITICAL THINKING 31–2

3-5.1.1

Mary Ann Smith needs to create a new password. Her current password is mas0117 (her initials and her date of birth).

1. Create a new password for Mary Ann—one that is strong and easy to remember.
2. Submit the new password as directed by your instructor.

ONLINE DISCOVERY

As mentioned in this lesson, there are ongoing debates about Internet censorship vs. freedom of speech.

1. Use your Web browser to search for information regarding Internet censorship debates.
2. Write a brief summary about your own opinion about Internet censorship and freedom of speech.
3. Submit your summary as directed by your instructor.

IC3 3-4.2.1

JOB SKILLS

As emphasized throughout this text, computing technology changes rapidly. You can enhance your value as a job candidate or employee by staying informed about changes and advancements in technology.

1. Brainstorm some ways you can keep up with technology changes.
2. Create a list of at least five ways you can meet this goal.
3. Submit the list as directed by your instructor.

EXPLORE AND SOLVE

1. In this lesson you learned how to remove all the cookies from the Internet Explorer 11 browser. Explore how to remove individual cookies from the browser that you use most often.
2. Write a brief summary of your findings.
3. Submit the summary as directed by your instructor.

IC3 3-5.1.2

Estimated Time:
2.5 hours

Living Online

IC3 Pretest

REVIEW QUESTIONS

TRUE / FALSE

Circle T if the statement is true or F if the statement is false.

T F 1. You can attach only one file to an e-mail message.

T F 2. A domain name identifies the user in an e-mail address.

T F 3. A router breaks down the data into packets and identifies the best path for forwarding the packet to the specific target.

T F 4. Using desktop and laptop computers represents only a fraction of your interactions with computer technology.

T F 5. Backing up data regularly, such as once a week, is only necessary in large businesses and organizations.

T F 6. If you are unable to download or preview an e-mail attachment, it could be due to the size of the attachment.

T F 7. If the copyright notice isn't displayed prominently on the Web page, you do not have to cite the source of the information.

T F 8. A computer or device cannot connect to the Internet when the firewall is disabled.

T F 9. If you want to search online for words that appear next to each other, you should use phrase searching.

T F 10. All search engines use the same database, which explains why you often see the same results when you use different search engines.

T F 11. The terms Internet and Web are exactly the same and can be used interchangeably.

T F 12. The actual URL is a set of four numbers separated by periods.

T F 13. Embedded computers can be found in common home appliances.

T F 14. The Web cannot exist without the Internet.

T F 15. Although freedom of speech is a constitutional right, posting untrue or threating information on the Internet is unlawful.

MULTIPLE CHOICE

Select the best response for the following statements:

1. A _____ protects against unwanted access or use to or from a network.
   A. gateway
   B. hardware firewall
   C. firewall
   D. B or C
2. A _____ identifies a computer or Web site on the Internet.
   A. cache memory
   B. DNS
   C. domain name
   D. user agent
3. A(n) _____ is a network designed for the exclusive use of people within an organization.
   A. intranet
   B. extranet
   C. private network
   D. Virtual Private Network (VPN)
4. _____ is a type of online collaboration that combines the collective effort of many people to complete a task.
   A. Chatting
   B. Blogging
   C. Wiki
   D. Crowdsourcing
5. _____ are the rules that govern the transfer of data and ensure that information created by one system can be interpreted and read by another.
   A. Source codes
   B. Protocols
   C. Channels
   D. Knowledge bases
6. In a _____ network, one or more computers on the network act as a server.
   A. peer-to-peer (P2P)
   B. client/server
   C. Public Switched Network (PSN)
   D. Public Switched Telephone Network (PSTN)
7. _____ is the programming language used to create Web pages.
   A. HyperText Transfer Protocol (HTTP)
   B. HyperText Markup Language (HTML)
   C. Rich Text format
   D. Plain Text format
8. A _____ is the complete set of e-mail messages from the original message through all the responses.
   A. message thread
   B. conversation
   C. message stem
   D. A or B
9. A URL always includes a _____ protocol, the domain name, and the domain type or a country code.
   A. protocol
   B. domain name
   C. domain type or country code
   D. all of the above
10. _____ is a technique for transferring data so you can start displaying the data before the transmission is completed.
    A. Streaming
    B. Stemming
    C. Packet switching
    D. Filtering
11. A _____ sends queries to several other search engines.
    A. Web directory
    B. Metasearch engine
    C. search directory
    D. meta tag
12. The creator of _____ software retains the copyright, and the license usually allows unlimited copying and distribution but forbids any changes to the program.
    A. open source
    B. public domain
    C. shareware
    D. freeware

13. _____ are automated software applications that use an algorithm to search Web sites for relevant information.
    A. Spiders
    B. Keyloggers
    C. Webcrawlers
    D. A or C
14. E-mail programs provide _____ so you don't become a fallen victim to scams and identity theft.
    A. encryption
    B. phishing filters
    C. spam filters
    D. all of the above
15. _____ are electronic documents that verify the identity of a person or company and confirm that they own a public key.
    A. Credentials
    B. Digital signatures
    C. Digital certificates
    D. Trademarks

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. _____ is a text-based form of communication primarily used for conversational text and best used when correspondence needs to be accessed in real time.
2. _____ format is the programming language used to create Web pages.
3. Purchasing and selling products or services on the Internet, or through other computer networks is called _____.
4. _____ is the most common communications protocol used for transporting data between computers on the Internet.
5. A(n) _____ is a type of network that covers a large geographical area and can contain communication links across metropolitan, regional, or national boundaries.
6. _____ refers to good manners and proper behaviors when communicating through electronic media.
7. Downloadable audio broadcasts are known as _____.
8. _____ extends the core capability of Short Messaging Service (SMS) and enables you to send messages that include multimedia content.
9. In browsers such as Internet Explorer, the _____ displays the URL of the active Web page.
10. A(n) _____ is a software application you use to view and retrieve documents from the Web and to display the documents in a readable format.
11. _____ uses radio waves to provide wireless high-speed Internet and network connections.
12. _____ is the unlawful reproduction and/or distribution of any copyrighted digital files including videos, music, e-books, and software.
13. A(n) _____ is an organization or company that provides connectivity to the Internet through a telecommunications line or wireless system.
14. _____ communications occur instantly or without noticeable delay.
15. _____ is the process of backing up your e-mail messages.

PROJECTS

PROJECT 3–1

1. Start your Web browser and create a new folder in your Favorites list labeled **P3–1**.
2. Use a search engine of your choice to find information protecting your computer from viruses.
3. Save at least three of the most informative Web site addresses to your Favorites folder.
4. Evaluate each of the Web sites in your P3-1 folder to determine if they are a reliable source of information.
5. Prepare a brief summary about which Web site(s) you think are most trustworthy and explain the reasons for your choice(s).
6. Submit the summary as directed by your instructor.

PROJECT 3–2

The human resources manager at your company has asked you to help her create a training presentation for employees about responsible computer use. The purpose of the presentation is to cover topics about computer security and computer safety and ethics. She wants you to provide information on the following:

- The importance of backing up data.
- How passwords are created and why they are periodically updated and should not be shared with others.
- Explain why it is important to use computers legally and responsibly.
- How to maintain a healthy computing environment.

1. Create some presentation slides that clarify the key points for your assigned topics.
2. Submit the slides as directed by your instructor.

PROJECT 3–3

Electronic communication offers many advantages for sharing information, but there are also disadvantages to this advance in technology. For example, the "electronic trail" created in social media can be dangerous to your career and your life.

1. Interview three or more people and ask them about the negative effects of using technology to communicate.
2. Write a brief summary for each interview describing the negative effect that the individual experienced with communication technology.
3. Submit the summaries as directed by your instructor.

SIMULATION

Scenario:

Congratulations! You were just hired for a Telecommute Customer Service/Marketing Rep position at a company that focuses mostly on Internet marketing.

Working from your home office, you will set up appointments and follow up on customer care, assist with company promotions, place online ads, and create marketing campaigns. You can create your own work schedule, but you must be available every Monday morning for a video conference with your regional manager.

JOB 3–1

To prepare for your new job, you need to set up your home office workspace. To help you get started, the employer will reimburse you a set amount for the expenses, but it is your responsibility to choose the hardware and software that you want to use.

1. Create detailed lists for the following:
   - Hardware
   - Services
   - Software applications
   - Office furniture
2. Submit the lists as directed by your instructor.

JOB 3–2

In this new position, you will be saving sensitive data on your computer.

1. Write a brief summary explaining the security measures you would take to make sure you have secure Internet connections and that the company data is protected.
2. Submit the summary as directed by your instructor.

JOB 3–3

The employer has assigned another representative in your area to mentor you and prepare you for this new job assignment. The mentor travels with you once a week, and he says that when you have questions or need help, you can contact him at any time via calls, text messages, or e-mails.

1. Describe the type of communication you would use to contact your mentor when you need support for the following issues. Explain why you would choose that type of communication.
   - It's the first time you are submitting the monthly expense form, and you want to make sure you have entered the data correctly.
   - The mentor traveled with you the entire day, and you want to thank him for the time he spent with you and the valuable advice he gave you.
   - You need to return a phone call to a customer who is very dissatisfied with a recently-purchased product, and you're not sure how to handle the situation.
   - You need to confirm the fax number for the main office.
   - You have an idea for a new marketing slogan, and you want to share your idea with the mentor to get his feedback.
   - You want to share with the mentor some positive experiences you had talking with customers today.
2. Submit the list of responses as directed by your instructor.

JOB 3–4

You just received an e-mail message from a client, and the client is not satisfied with a recently-purchased product from your company.

1. Write a brief summary explaining what you would consider when responding to the client's e-mail message.
2. Submit the summary as directed by your instructor.

JOB 3–5

Today is your first day to participate in the video conference with your regional manager and colleagues.

1. Write a brief summary explaining what you would do to prepare for the conference.
2. Submit the summary as directed by your instructor.

JOB 3–6

One of your first projects is to design a new Web page for the company to promote a new product.

1. Write a brief summary explaining what elements you will include to create a Web page that customers will trust.
2. Submit the summary as directed by your instructor.



Estimated Time:
1 hour

APPENDIX A

Using Windows 7

OBJECTIVES

Upon completion of this appendix, you should be able to:

- Describe the Windows 7 desktop.
- Start applications in Windows 7.
- Use Windows Explorer to manage files.
- Use the Control Panel.
- Shut down Windows 7.

DATA FILES

You do not need data files to complete this appendix.

Microsoft product screenshots used with permission from Microsoft Corporation.

In this lesson, you learn how to perform basic computer tasks using Windows 7. You start by displaying the desktop and starting applications. Next, you use Windows Explorer to view folders and files and then navigate from one folder to another. You also manage files by creating a file, copying it, renaming the file, and then moving it. Finally, you explore the Control Panel and shut down Windows 7.

Touring Windows 7

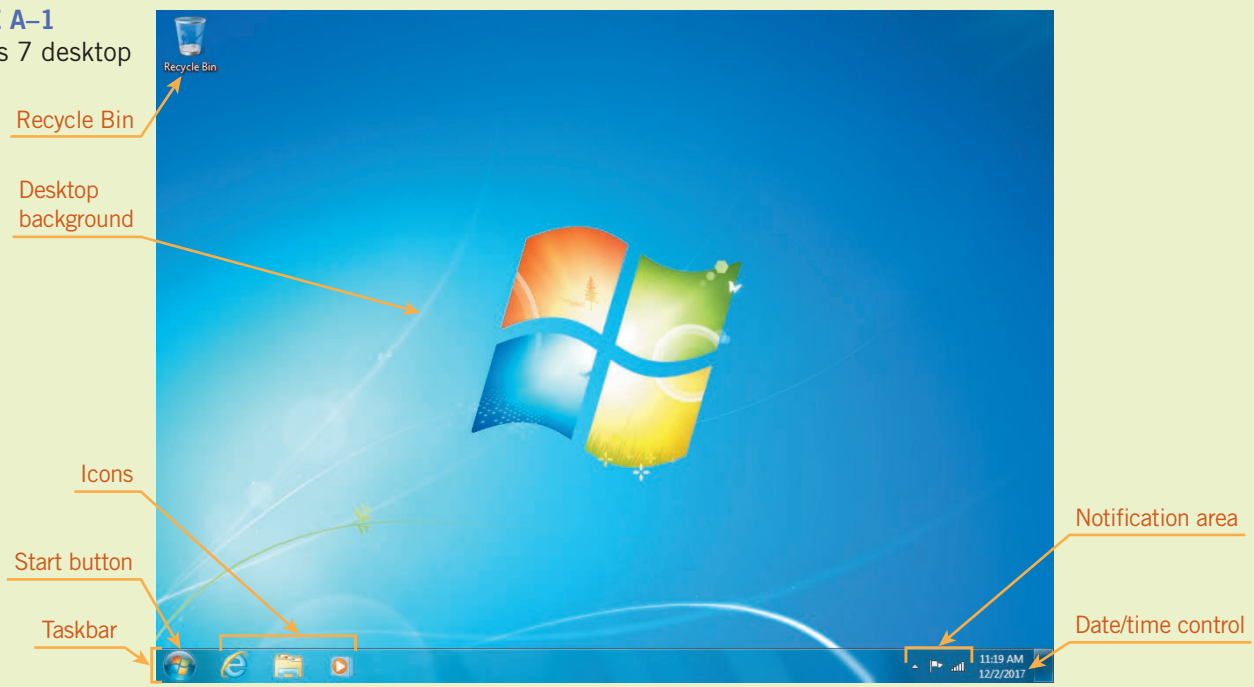
Windows 7 is a popular operating system developed by Microsoft Corporation. If you are using a computer that runs Windows 7, the operating system starts when you turn on the computer. After completing its start-up tasks, Windows 7 displays a Welcome screen, which lists all the users for the computer. Before you begin working with Windows 7, you might need to click your user name (a unique name that identifies you to Windows 7) and type a password (a confidential series of characters).

In Step-by-Step A.1, you start Windows 7. Make sure your computer is turned off before you perform the following steps.

Step-by-Step A.1

1. Turn on your computer. After a moment, Windows 7 starts and the Welcome screen appears.
2. On the Welcome screen, click your user name and enter your password, if necessary. The Windows 7 desktop appears, as shown in **Figure A–1**. Your desktop might look different.

FIGURE A–1
Windows 7 desktop



The desktop is your starting point for all of your computer work, including opening applications, folders, and files.

Starting Applications

To start an application, you click the Start button on the taskbar to open the Start menu, which lists the applications, documents, and other resources on your computer. The Start menu is organized into two panes. The left pane lists applications you use often, while the right pane provides access to folders and tools you use often, such as Help and Support. If the application you want to start is not listed in the left pane, you can point to the All Programs command to access all the applications installed on your computer.

In Step-by-Step A.2, you use the Start button to start WordPad, a basic word-processing program provided with Windows 7.

Step-by-Step A.2

1. Click the **Start** button on the taskbar to open the Start menu. See **Figure A–2**. Your Start menu might display different applications.

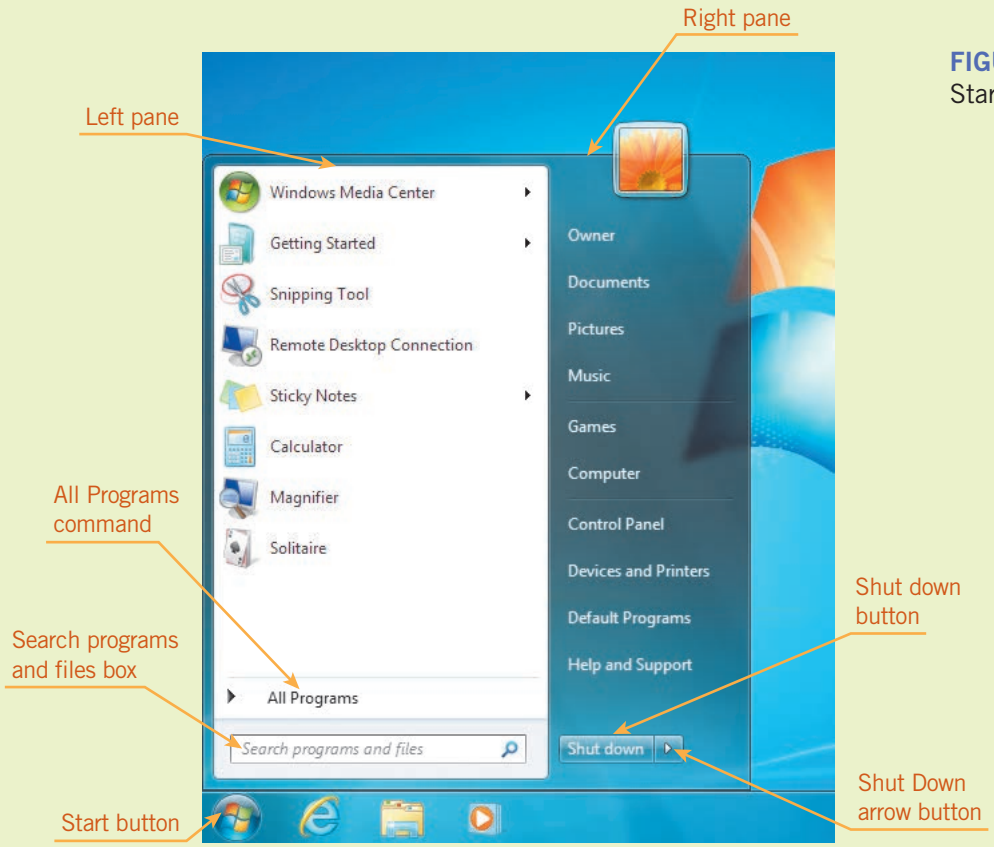
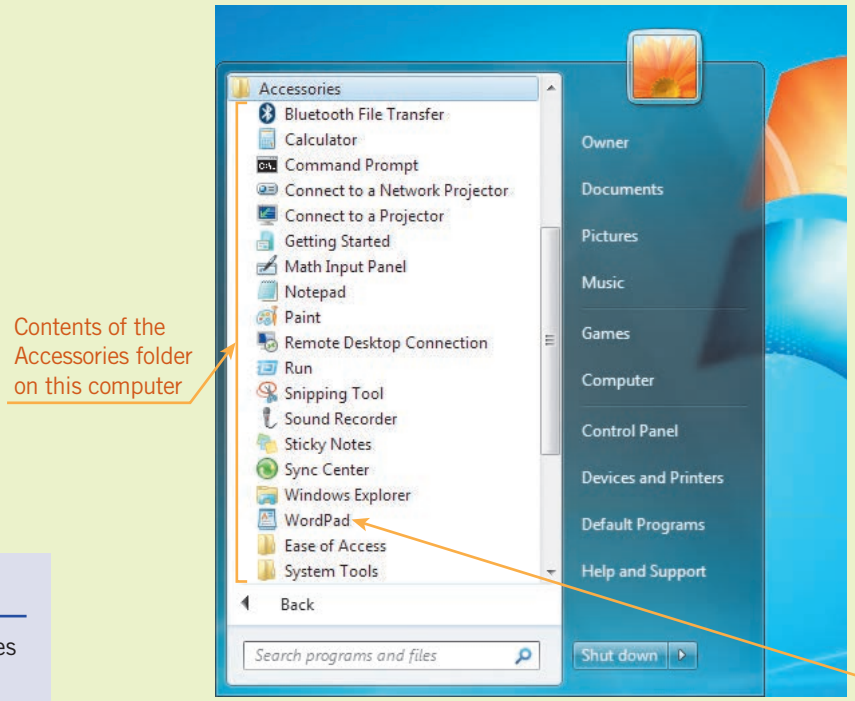


FIGURE A–2
Start menu

2. Point to *All Programs* to display the All Programs menu, and then scroll to locate and then click the **Accessories** folder. See **Figure A–3**. Your Accessories folder might display different applications and folders.

FIGURE A–3
Accessories folder displayed on the Start menu

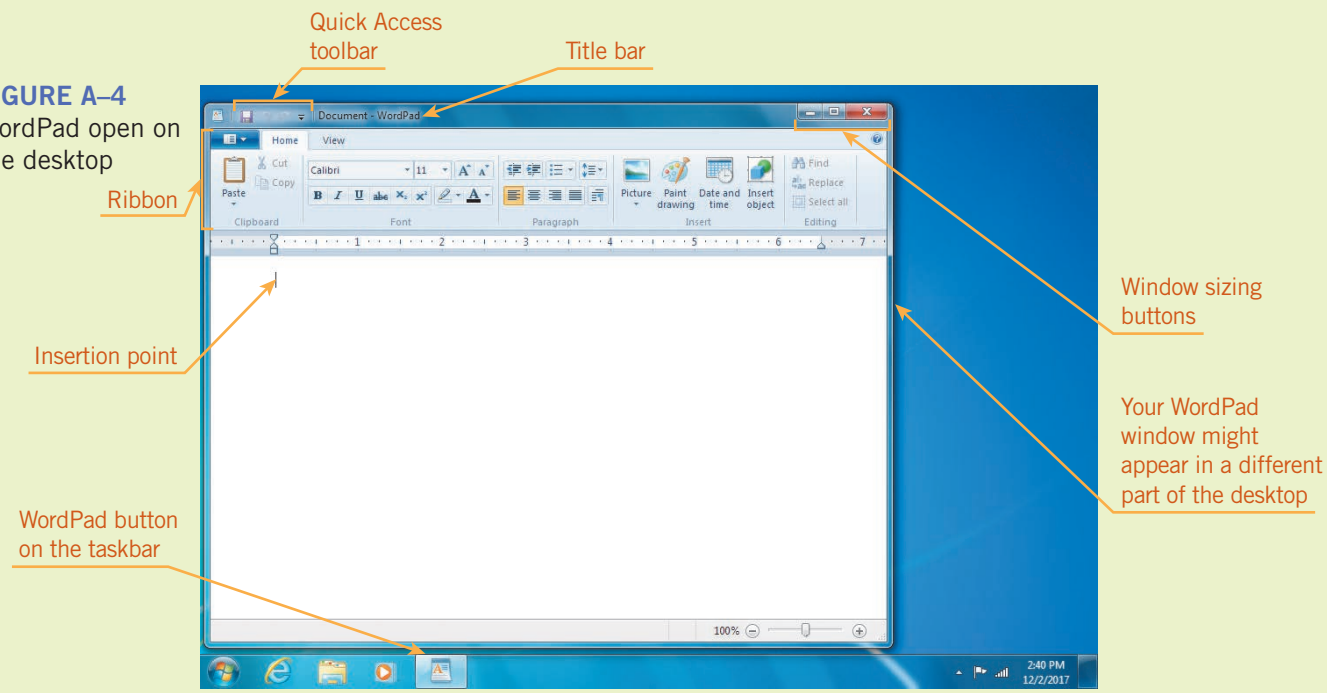


QUICK TIP

In the Search programs and files box, you can type the name of an application or file to display it in the left pane of the Search menu. Click the application or file to open it.

3. Click **WordPad** to start the WordPad application. See **Figure A–4**. If the WordPad window is maximized so that it fills the entire screen, click the **Restore Down** button on the title bar to reduce the size of the window.

FIGURE A–4
WordPad open on the desktop



4. Keep the WordPad window open for the next Step-by-Step.

Running Multiple Applications

Because Windows 7 is a multitasking operating system, you can run more than one program at a time. As you saw in Step-by-Step A.2, when you start an application, its button appears on the taskbar. If two or more applications are open and running, you can switch from one application to another by clicking the appropriate button on the taskbar.

In Step-by-Step A.3, you start Paint, a graphics-editing application, and then switch from Paint to WordPad.

QUICK TIP

To use WordPad, you type text at the insertion point, and then use the controls on the Ribbon to format the text, insert other objects such as pictures, and change the view of the WordPad window.

Step-by-Step A.3

1. Click the **Start** button on the taskbar, point to *All Programs*, click **Accessories**, and then click **Paint**. The Paint application starts and opens on the desktop.
2. If the Paint window is maximized, click the **Restore Down** button on the Paint title bar and then drag the Paint window by its title bar if necessary to display some of the WordPad window. See **Figure A–5**.

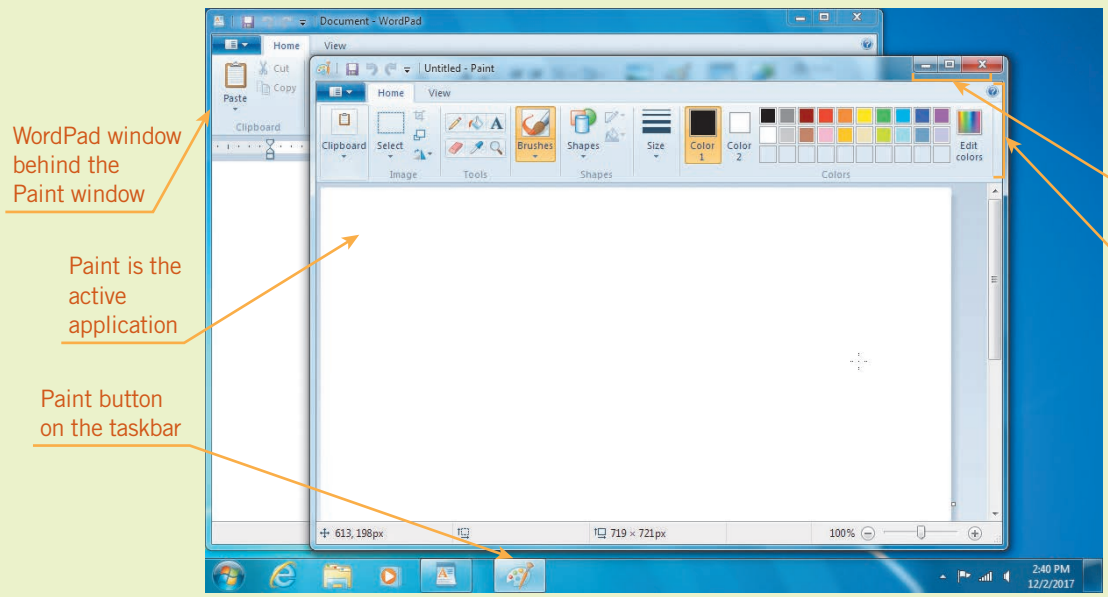


FIGURE A–5
Two applications open on the desktop

Paint is now the active application because its window appears in front of the WordPad window. You should know which application is active because Windows applies your next keystroke or command to the active application. Because only one application is active at a time, you need to switch between applications if you want to work in one or the other. Next, you make WordPad the active application.

3. Click the **WordPad** button on the taskbar. The WordPad window moves to the front, indicating that WordPad is the active application.

QUICK TIP

To use Paint, you select a tool on the Ribbon, and then click or drag in the window to draw or edit an image in the Paint window.

4. Click the **Minimize** button  on the WordPad title bar. The WordPad window is reduced, so that only the WordPad button on the taskbar is displayed. The WordPad button is still highlighted on the taskbar, indicating that its window is still open, though it is not displayed on the desktop.

Closing Applications

When you are finished using an application, you should close (or exit) the application to conserve system resources. To close an application, you can click the Close button located in the upper-right corner of the application window. If the application window is minimized, you can close the application by using the shortcut menu associated with the application button on the taskbar. (You can also close open windows using the shortcut menu.)

In Step-by-Step A.4, you close Paint using the Close button, and you close WordPad using the taskbar button shortcut menu.

Step-by-Step A.4

1. Click the **Close** button  on the Paint title bar to exit Paint. The Paint button no longer appears on the taskbar.
2. Right-click the **WordPad** button  on the taskbar, and then click **Close window** on the shortcut menu to exit WordPad.

Using Windows Explorer

To discover the files and folders stored on your computer, you can use Windows Explorer, which is a Windows 7 application designed to help you navigate your computer. Like the Start menu, Windows Explorer has two panes. The left pane is the Navigation pane, which lists icons for the drives, folders, libraries, and other resources you can access on your computer. When you select an object such as a folder icon in the Navigation pane, its contents appear in the right pane. Instead of a Ribbon, the Windows Explorer window includes a menu bar and a toolbar you use to perform tasks. As you open folders and navigate with Windows Explorer, the buttons on the toolbar change so that they are appropriate for your current task. In addition, Windows Explorer has a Details pane at the bottom of the window, which displays details about the selected object.

In Step-by-Step A.5, you start Windows Explorer and examine its window.

QUICK TIP

In Windows Explorer, a library displays files and folders of files of a similar type together, no matter where they are stored, so you can locate them easily.

Step-by-Step A.5

1. Click the **Windows Explorer** button on the taskbar. The Windows Explorer window opens, displaying the contents of the Libraries folder. See **Figure A–6**.

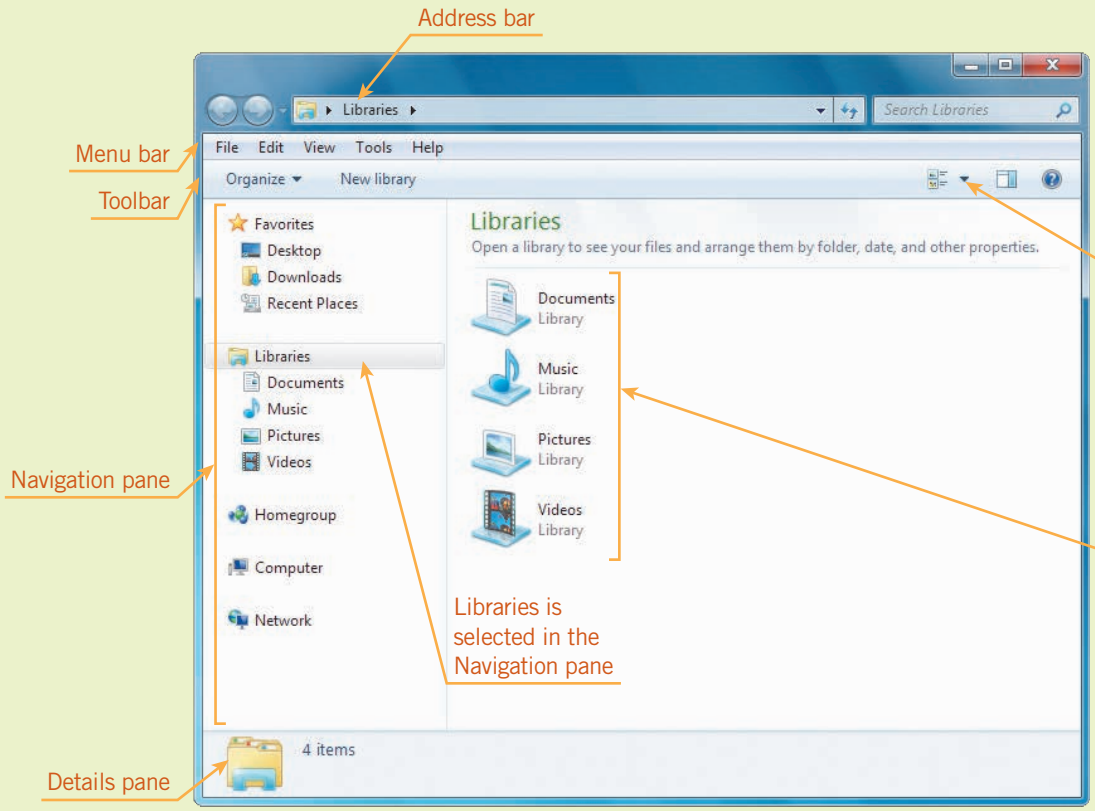


FIGURE A–6
Windows Explorer

2. In the Navigation pane, click **Pictures**. The right pane displays the contents of the Pictures library.
3. In the right pane, double-click the **Sample Pictures** folder to open the folder. The right pane of the window shows the contents of the folder you double-clicked. You can learn more about the contents of a folder by selecting one or more of its files.
4. Click the **Chrysanthemum** picture file to display its details in the Details pane, including the date the picture was taken, its dimensions, and its file size.

Changing View Settings

Windows 7 provides various ways to view the contents of a folder, including Extra Large Icons, Large Icons, Medium Icons, Small Icons, List, Details, Tiles, and Content. The default view for folders in the Pictures library is Large Icons view, which displays a thumbnail showing the file contents. For all other folders, the default is Details view, which displays a small icon and lists details about each file. In this view, the icon provides a visual cue about the file type. Although only Details view lists all file details, such as the name, date modified, type, and size, you can see these details in any other view by selecting a file to display its details in the Details pane or by pointing to a file to display a ScreenTip.

In Step-by-Step A.6, you use the Change your view button arrow on the toolbar to change the view settings in Windows Explorer.

Step-by-Step A.6

1. In the Windows Explorer window, click the **Change your view button arrow** on the toolbar to display a menu of view options. See **Figure A–7**.

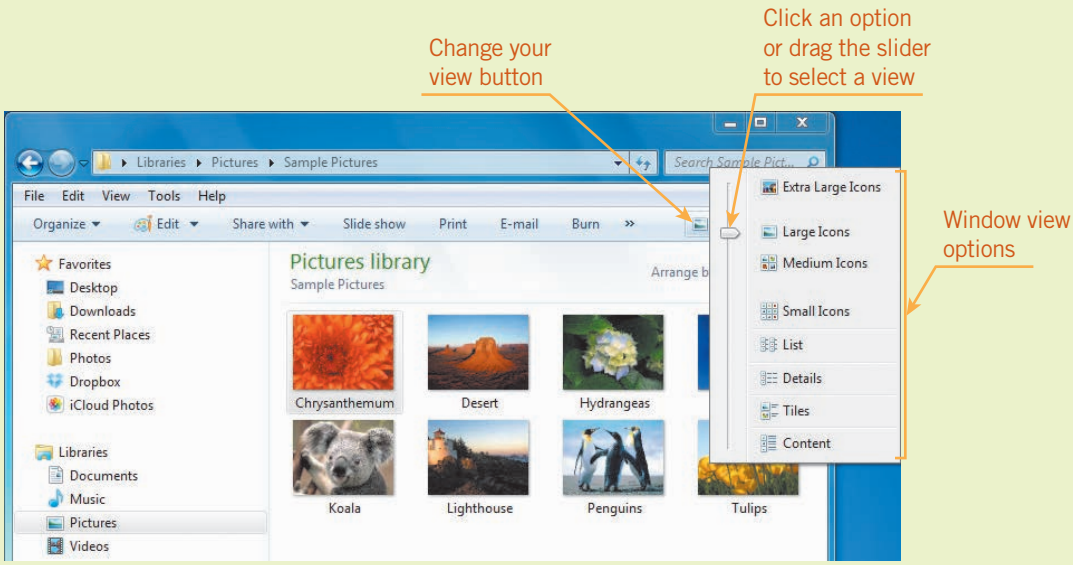


FIGURE A-7
Change your view menu

QUICK TIP

If you click the Change your view button instead of the arrow, you cycle through the views.

2. Click **Details**. The window shows the same files, but with icons instead of thumbnails and file details.
3. Click the **Change your view button arrow** on the toolbar, and then click **Large Icons** to return to Large Icons view.

Navigating Folders

To navigate the file system on your computer, you use the Navigation pane in Windows Explorer. The Navigation pane organizes resources into the following five categories:

- *Favorites*—Locations you access frequently, such as the desktop.
- *Libraries*—The Windows default libraries.
- *Homegroup*—Your shared home network, if any.
- *Computer*—The drives and devices on your computer.
- *Network*—Network locations your computer can access.

When you move the pointer into the Navigation pane, triangles appear next to some icons. An open triangle, or expand icon, indicates that a folder contains other folders that are not currently displayed in the Navigation pane. Click the triangle to expand the folder and display its subfolders. A filled triangle, or collapse icon, indicates the folder is expanded, and its subfolders are listed below the folder name.

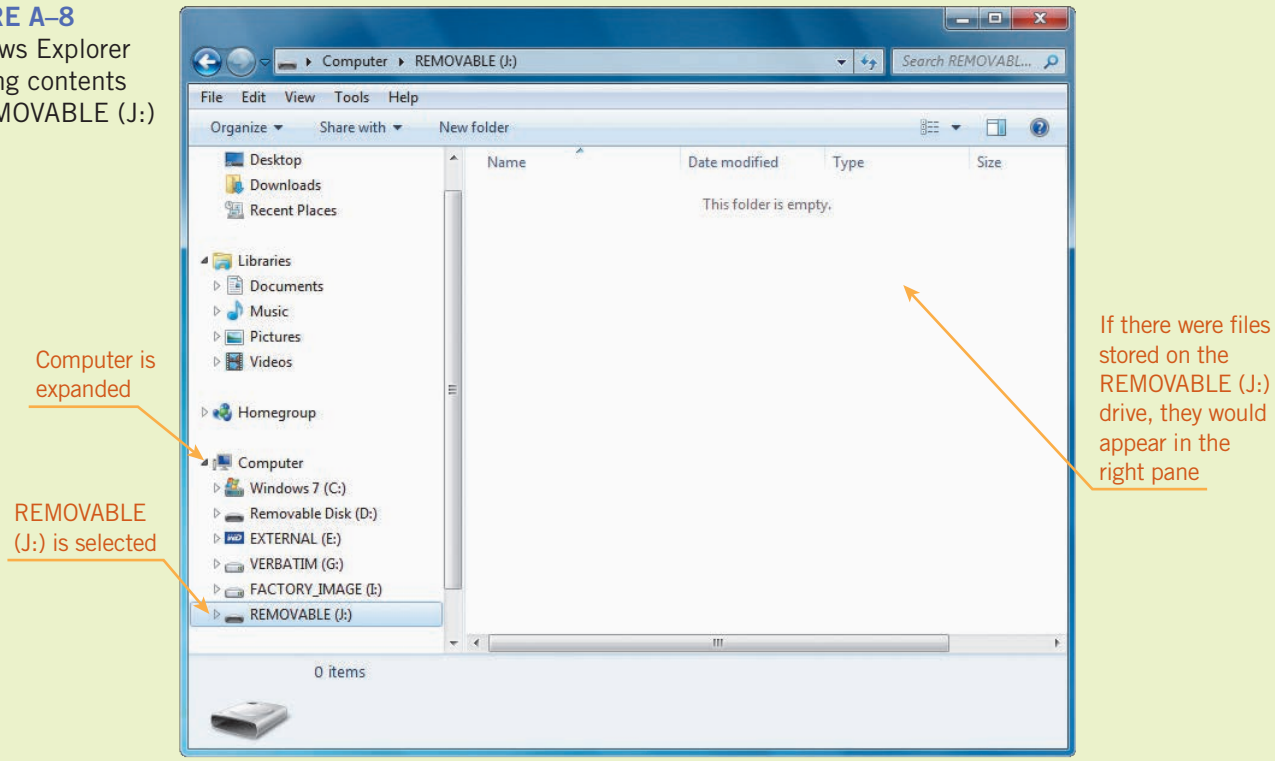
In Step-by-Step A.7, you insert an empty USB drive into a USB port on your computer, and then use Windows Explorer to navigate to that drive, which is shown as REMOVABLE (J:) in the following steps. If your USB drive is attached to a different drive, substitute its name and drive letter for the remaining steps in this appendix.

Step-by-Step A.7

1. Insert an empty USB drive into a USB port on your computer. If an AutoPlay window opens showing options for working with the contents of the USB drive, close it so you can use the Navigation pane in the Windows Explorer window to navigate to the drive.
2. If necessary, click the **expand** icon  next to Computer in the Navigation pane to display the drives on your computer, including the USB drive.

3. Click **REMOVABLE (J:)** (or other name) to display the contents of the USB drive, which at this stage should be empty. See **Figure A–8**.

FIGURE A–8
Windows Explorer showing contents of REMOVABLE (J:) drive



Managing Files

To manage your files, your first task is often creating folders that will contain the files. Next, you can create, copy, and move files into the folders to organize the files logically, which makes them easier to find later.

In Step-by-Step A.8, you create two folders on your USB drive, and then use WordPad to create and save a short text file in one of the new folders. You can create a file using the New folder button on the toolbar or the New command on the shortcut menu that appears when you right-click a blank area in Windows Explorer. You use both methods in the following steps.

Step-by-Step A.8

1. In Windows Explorer, switch to Large Icons view so it is easier to manipulate folders.
2. Click the **New folder** button on the toolbar. A folder icon with the label "New folder" appears in the right pane. See **Figure A–9**. Windows uses "New folder" as a placeholder, and selects the text so that you can replace it with a more descriptive name.

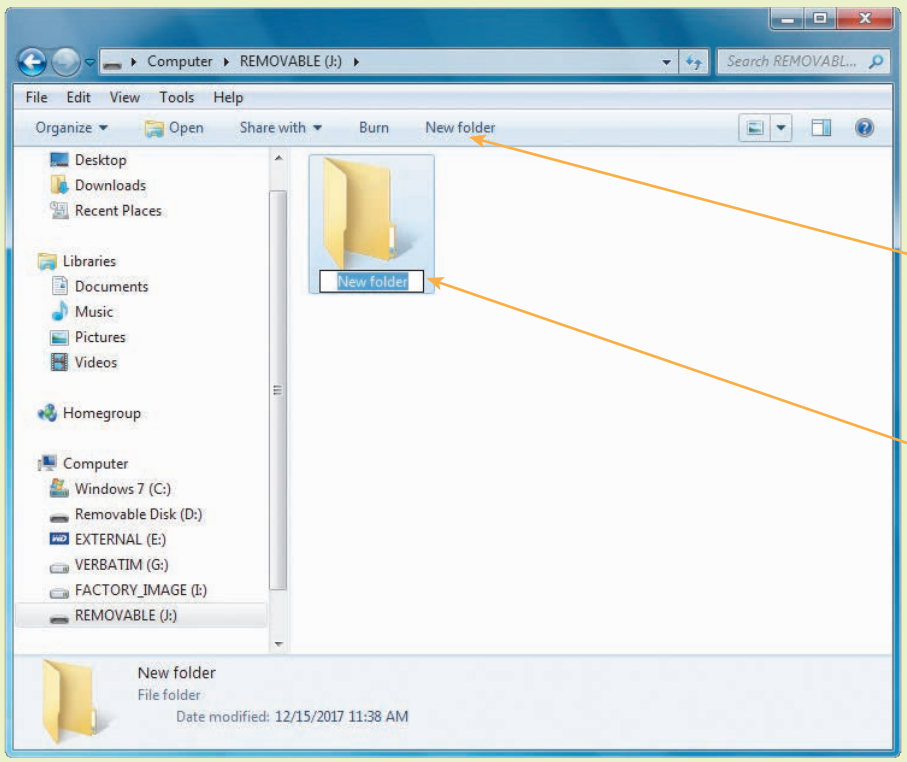


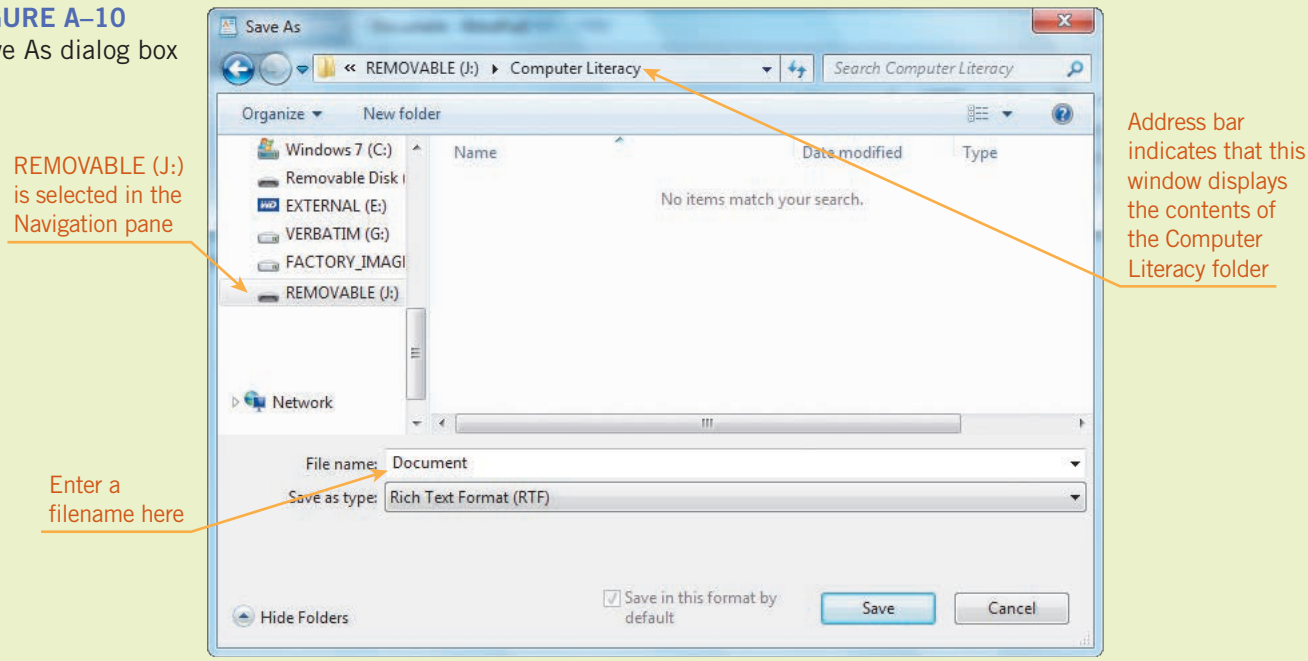
FIGURE A–9
Creating a folder

3. Type **Computer Literacy** as the folder name, and then press the **Enter** key. The new folder is named Computer Literacy and is the selected item in the right pane. Next, you can create a second folder using a shortcut menu.
4. Right-click a blank area of the Windows Explorer window, point to *New* on the shortcut menu, and then click **Folder**. A folder icon with the label "New folder" appears in the right pane with the "New folder" text selected.
5. Type **Key Terms** as the name of the new folder, and then press the **Enter** key. Now you can create a short text file and save it in one of the new folders.
6. Start WordPad. In the WordPad window, type the following text:

   Computer literacy: Being able to understand and use today's computer hardware and software to enhance your life and the lives of those around you.

7. Click the **Save** button on the Quick Access toolbar to display the Save As dialog box. This dialog box has the same tools for working with files and folders as in Windows Explorer.
8. In the Navigation pane, click **REMOVABLE (J:)** and then double-click the **Computer Literacy** folder in the right pane to open it. See **Figure A–10**.

FIGURE A–10
Save As dialog box



9. Select the text in the File name box, and then type **Description** as the filename.
10. Click the **Save** button to save the text file in the Computer Literacy folder and close the Save As dialog box.
11. Close WordPad.

Copying, Moving, and Renaming Files

You can copy and move files using a variety of methods. Two easy ways to copy and move files are using keyboard shortcuts and using a shortcut menu. In either case, you select a file and use the Copy or Cut command to temporarily store the file on the Clipboard, and then use the Paste command to insert the file elsewhere. The keyboard shortcuts for these commands are as follows:

- Copy command: Ctrl+C
- Cut command: Ctrl+X
- Paste command: Ctrl+V

After copying or moving a file, you might want to rename it. To do so, you can right-click the file, click Rename on the shortcut menu to select the filename, and then type to enter a new name. All of these techniques apply to folders as well—you can copy, move, and rename folders using the same keyboard shortcuts and shortcut menus.

In Step-by-Step A.9, you copy the Description file to the root directory of your USB drive, rename it, and then move it to the Key Terms folder using keyboard shortcuts and shortcut menus.

Step-by-Step A.9

1. Navigate to the Computer Literacy folder to display its contents—the Description file.
2. Click the **Description** file, and then press the **Ctrl+C** keys to copy the file to the Clipboard.
3. In the Navigation pane, click **REMOVABLE (J:)** to display its contents in the right pane, and then press the **Ctrl+V** keys to paste the Description file in the root directory of the USB drive.
4. Right-click the **Description** file, and then click **Rename** on the shortcut menu to select the filename. Type **Comp Lit Definition** and then press the **Enter** key to rename the file. See **Figure A–11**.

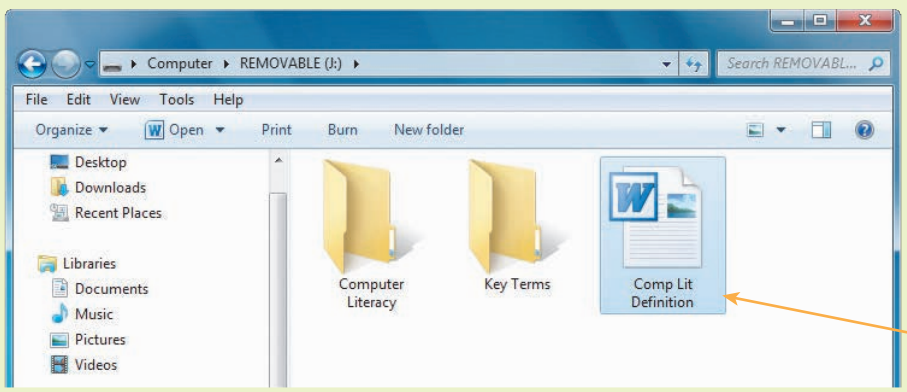


FIGURE A–11
Renamed file

5. Right-click the **Comp Lit Definition** file and then click **Cut** on the shortcut menu.
6. In the right pane, right-click the **Key Terms** folder and then click **Paste** on the shortcut menu. You can confirm that Windows moved the Comp Lit Definition file to the Key Terms folder.
7. In the right pane, double-click the **Key Terms** folder to open it. The Key Terms folder now contains the Comp Lit Definition file.

Deleting Files and Folders

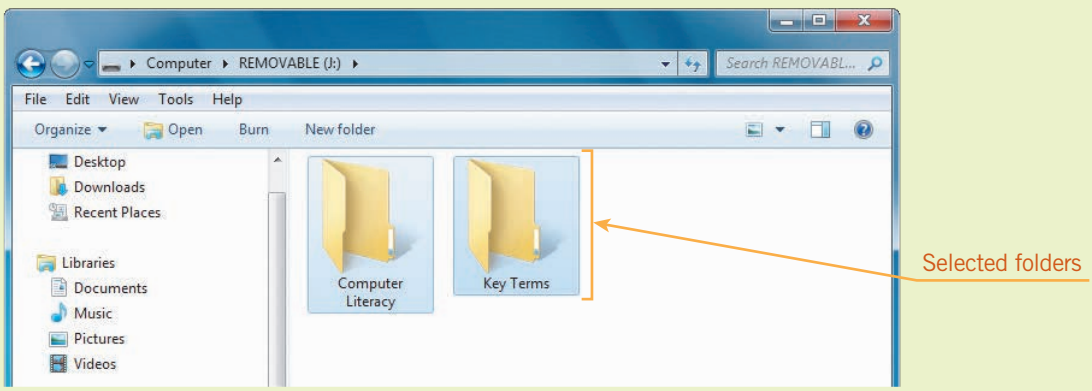
If you are no longer using files or folders, you should delete them so they don't consume disk space unnecessarily. In Windows Explorer, you delete a file or folder by deleting its icon. When you delete a file from a hard disk, Windows removes the file from the folder but stores the file contents in the Recycle Bin. If you change your mind and want to retrieve a file or folder deleted from your hard disk, you can use the Recycle Bin icon on the desktop to open the Recycle Bin window, where you can recover the file or folder and return it to its original location. However, after you empty the Recycle Bin, you can no longer recover the files and folders it contained.

The files and folders you created in this appendix were for practice only, so you can delete them. In Step-by-Step A.10, you delete the files and folders efficiently by selecting both folders first and then deleting them, which also deletes all the files they contain. You can delete files and folders using the Delete command on the shortcut menu or using the Delete key.

Step-by-Step A.10

1. Navigate to the root directory of your USB drive.
2. Click the **Computer Literacy** folder, hold down the **Shift** key, click the **Key Terms** folder, and then release the **Shift** key. The two folders are now selected. See **Figure A–12**.

FIGURE A–12
Folders selected for deletion



3. Press the **Delete** key to indicate that you want to delete the folders. A message box opens, asking if you're sure you want to delete these folders.
4. Click the **Yes** button to confirm that you want to delete two folders.
5. Close Windows Explorer.

Using the Control Panel

To change the way Windows looks and interacts with hardware and other software, you use the Control Panel, a window that contains specialized tools for customizing Windows. By default, the Control Panel organizes these tools into eight categories: System and Security; Network and Internet; Hardware and Sound; Programs; User Accounts and Family Safety; Appearance and Personalization; Clock, Language, and Region; and Ease of Access. Each category includes links to tools you can use to control the settings on your computer, such as its appearance and system time.

In Step-by-Step A.11, you use the Control Panel to explore options for changing the desktop theme, a collection of settings including the desktop background, colors for screen elements such as window borders, system sounds, and a screen saver.

Step-by-Step A.11

1. Click the **Start** button on the taskbar, and then click **Control Panel** in the right pane to open the Control Panel. See **Figure A–13**. The main window of the Control Panel is called the Control Panel Home page. By default, the Control Panel is displayed in Category view.



FIGURE A–13
Control Panel

2. If your Control Panel is not displayed in Category view, click the **View by** button, and then click **Category**.

3. Click the **Appearance and Personalization** link to open the Appearance and Personalization window. See **Figure A–14**. Like other Control Panel windows, this one lists categories and tools in the right pane and links to the Control Panel Home page and other main categories in the left pane.

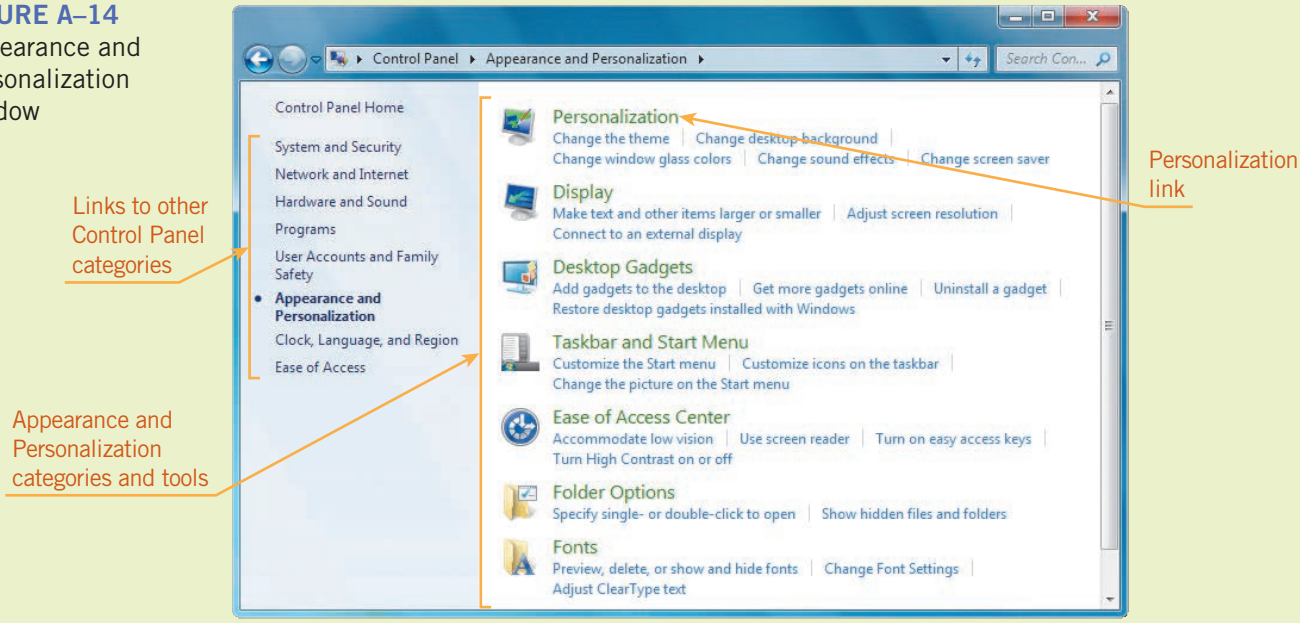


FIGURE A–14
Appearance and Personalization window

4. Click the **Personalization** link to open the Personalization window. Scroll the window to display all the themes you can use on your computer. See **Figure A–15**. The Aero themes include high-resolution images with translucent effects. Themes with more than one image play a slide show of backgrounds on the desktop. The Basic and High Contrast themes do not include translucent effects.

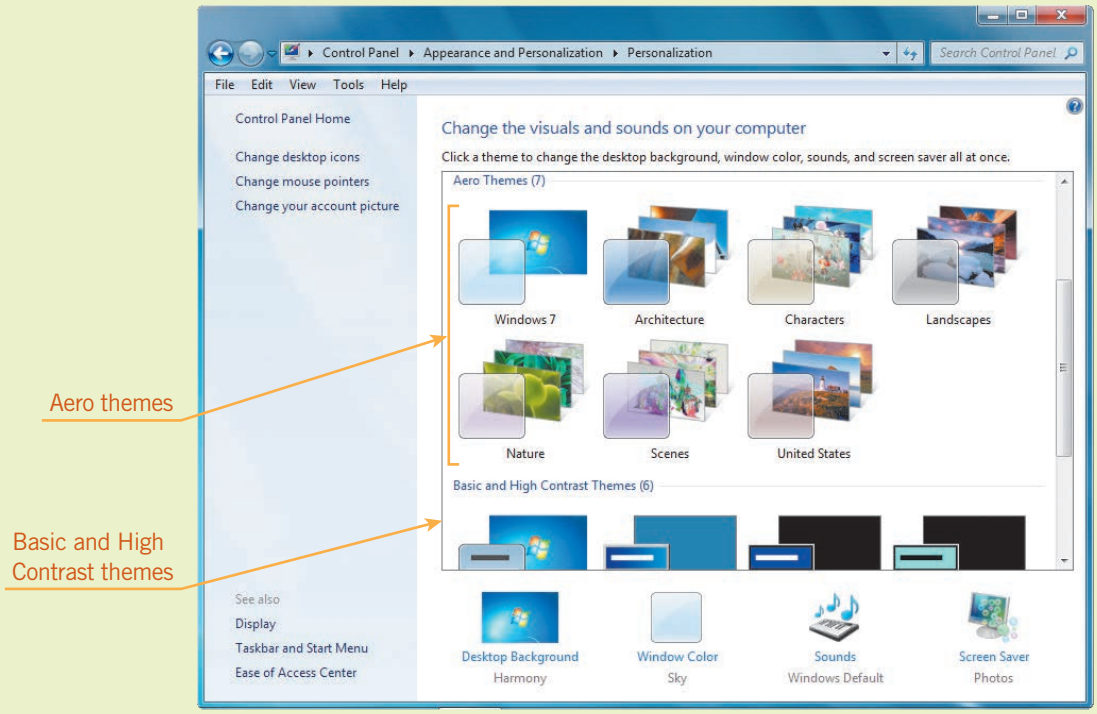


FIGURE A–15
Personalization window

5. Note your current theme, and then click a different one, such as **Architecture**. The desktop background changes to an architecture image, the taskbar and window borders change color, and a sound plays if your speakers are turned on.
6. Click your original theme, such as **Windows 7**, to restore your desktop to its original state.
7. Close the Personalization window.

Shutting Down Windows 7

When you are finished working with Windows, you can end your Windows session in the following ways:

- *Shut down*—Closes all open applications and other windows, closes Windows, and then turns off the computer.
- *Switch user*—Allows you to switch to another user account (if more than one user account is set up on the computer).
- *Log off*—Closes all open applications and other windows, and then displays the Welcome screen so another user can sign in to Windows.
- *Lock*—Keeps your desktop in its current state but displays the Welcome screen to protect your work.
- *Restart*—Shuts down the computer and then immediately restarts it.
- *Sleep*—Saves your work and turns down the power to the computer.

To shut down the computer, you click the Shut down button on the Start menu. To access the other options, click the Shut down arrow button. See **Figure A–16**.

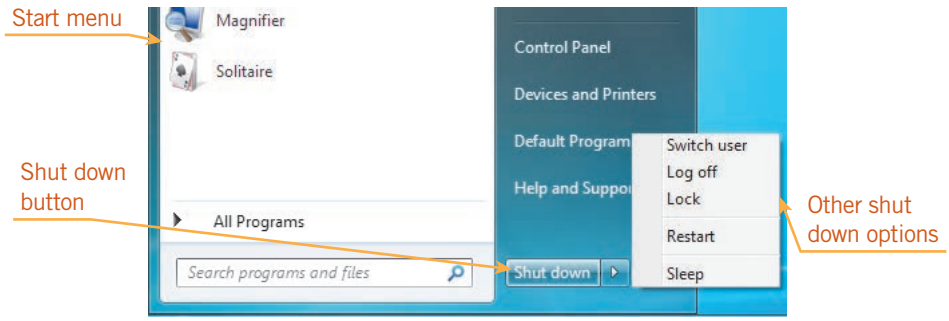


FIGURE A–16 Shut down options

By default, Windows 7 is set to sleep after 15–30 minutes of idle time, depending on whether you are using a laptop or desktop computer. You can generally let Windows go to sleep if you do not plan to use your computer for up to a day. If you are using a laptop computer, are away from a wall outlet, and are running low on battery power, you should shut down Windows instead. If you do not plan to use a desktop computer for more than a day, such as over the weekend, you should also shut it down to save wear and tear on its components and to prevent damage from an electrical storm or power surge.



APPENDIX B

A Comprehensive Guide to IC^3

IC^3/GS4 - MODULE 1: COMPUTING FUNDAMENTALS

STANDARDIZED CODING NUMBER	OBJECTIVES & ABBREVIATED SKILL SETS	PAGE
DOMAIN 1.0	**Operating System Basics**	
OBJECTIVE 1.1	**What is an OS and what does it do?**	
IC^3-1 1.1.1	Difference between applications and OS	Mod1-8 Mod1-15–16 Mod1-18–19
IC^3-1 1.1.2	Common OS features	Mod1-9–15 Mod1-20–25
IC^3-1 1.1.3	Software/hardware relationship	Mod1-34 Mod1-42–48
IC^3-1 1.1.4	Updates, software	Mod1-49–54
OBJECTIVE 1.2	**Manage computer files and folders**	
IC^3-1 1.2.1	Directory and folder hierarchy and structure	Mod1-64–71
IC^3-1 1.2.2	File/folder management	Mod1-71–81
IC^3-1 1.2.3	Common file extensions and default behavior .docx, .xlsx, .exe, .swf, .pdf, .text, .zip, .jpg, .tif, .mp3, .m4a, .avi, etc.	Mod1-81–82

OBJECTIVE 1.3	**Manage computer configuration, Control Panel, OS drivers**	
IC³-1 1.3.1	Basic desktop customization	Mod1-90–108
IC³-1 1.3.2	Describe the various states of operation available in a typical consumer-level OS. Include shutdown, hibernation, standby, fully awake, etc.	Mod1-108–109
IC³-1 1.3.3	Explain what the various power control, usage, and conservation settings available in a typical consumer-level OS are and how, when, and why to use them.	Mod1-109–113
IC³-1 1.3.4	Explain how, when, and why you would power down a computer.	Mod1-20–22 Mod1-108–113
IC³-1 1.3.5	Explain what hibernation is and how, when, and why you would hibernate a computer.	Mod1-108–113
IC³-1 1.3.6	User accounts and rights	Mod1-113–118
DOMAIN 2.0	**Computer Hardware and Concepts**	
OBJECTIVE 2.1	**Common computer terminology**	
IC³-1 2.1.1	Hardware and peripherals	Mod1-5 Mod1-34–38 Mod1-129–153
IC³-1 2.1.2	Storage	Mod1-39–40 Mod1-128–129 Mod1-153–158
OBJECTIVE 2.2	**Types of devices**	
IC³-1 2.2.1	Servers: definition, functionality, capacity, construction, capability, uses, etc.	Mod1-179–180
IC³-1 2.2.2	Desktops: functionality, capacity, construction, capability, uses, etc.	Mod1-168–169
IC³-1 2.2.3	Laptops: functionality, capacity, construction, capability, uses, etc.	Mod1-169–171
IC³-1 2.2.4	Tablets: functionality, capacity, construction, capability, uses, etc.	Mod1-170–171
IC³-1 2.2.5	Smartphones: functionality, capacity, construction, capability, uses, etc.	Mod1-172–173
IC³-1 2.2.6	Other mobile computing and communication devices: functionality, capacity, construction, capability, uses, etc.	Mod1-173–178
OBJECTIVE 2.3	**Computer performance**	
IC³-1 2.3.1	Specify criteria that could be used to evaluate the pros and cons of various computing devices and peripherals, focusing on performance issues.	Mod1-145 Mod1-147–149 Mod1-153 Mod1-168–173

IC³-1 2.3.2	Describe the concepts of processing capacity, processing speed, memory capacity, memory speed, storage capacity, and storage speed, including how each interacts with the other to determine overall computing capacity, speed, and power.	Mod1-166–167
DOMAIN 3.0	**Computer Software and Concepts**	
OBJECTIVE 3.1	**Software management**	
IC³-1 3.1.1	Describe how to install various kinds of software, including application software, drivers and system software, upgrades and patches, on various types of personal computers and configure the environment for use.	Mod1-190–197
IC³-1 3.1.2	Demonstrate how to uninstall various kinds and classes of software, including application software, drivers and system software, upgrades, and patches from various types of personal computers including desktops, laptops, tablets, and smartphones.	Mod1-198–201
IC³-1 3.1.3	Demonstrate how to reinstall various kinds and classes of software, including application software, drivers and system software, upgrades and patches for various types of personal computers including desktops, laptops, tablets, and smartphones.	Mod1-201–203
OBJECTIVE 3.2	**Licensing**	
IC³-1 3.2.1	Understand the various licensing models (especially freeware, shareware, open-source, and premium applications) used for computer software such as operating systems, application programs, system software, databases, browsers, etc.	Mod1-204–207
IC³-1 3.2.2	Demonstrate an understanding of the legal and ethical obligations associated with EULAs and the user's responsibilities, commitments, and benefits that can be derived by entering into a typical computer industry EULA.	Mod1-204–205
IC³-1 3.2.3	Demonstrate an understanding of the concept of a site license, how each party benefits, restrictions, obligations, etc.	Mod1-204
IC³-1 3.2.4	Demonstrate an understanding of the differences between single-seat and volume licensing agreements. Contrast how each party benefits.	Mod1-204
OBJECTIVE 3.3	**Software usage**	
IC³-1 3.3.1	Describe the dependencies and constraints that exist between hardware and software operation.	Mod1-34–39 Mod1-42–48
IC³-1 3.3.2	Demonstrate an understanding of the similarities and differences between a basic, consumer-level relational database management system and a typical spreadsheet program, including an understanding of which situations would be better suited to each.	Mod1-227–230

IC³-1 3.3.3	Describe what desktop publishing is, how and when desktop publishing software should be used, and the general feature set included in a representative desktop publishing program.	Mod1-219–220
IC³-1 3.3.4	Describe what a presentation program is, its purpose, how it is used, and the general feature set included in a typical consumer-level presentation program.	Mod1-220–224
IC³-1 3.3.5	Demonstrate how to use templates, default settings, and quick start aids to rapidly generate usable application user data.	Mod1-220–223
IC³-1 3.3.6	Describe the purpose and use of a personal computer-based entertainment program. List the features that could be expected to be found in such a program and explain how they work.	Mod1-230–231
IC³-1 3.3.7	Demonstrate how to edit, modify, or adjust (as appropriate) graphics, pictures, slides, audio, and video.	Mod1-231–233
OBJECTIVE 3.4	**Software tools**	
IC³-1 3.4.1	Explain what file compression is and how it works with various file types.	Mod1-234–235
IC³-1 3.4.2	Explain what software updates and patches are and how they are managed and applied to personal computers (PCs).	Mod1-49–54
IC³-1 3.4.3	Explain how files are stored on a hard disk. Demonstrate how to organize, compress, defragment, and otherwise optimize a computer's hard disk performance.	Mod1-235–240
IC³-1 3.4.4	Explain the danger posed by viruses and malware and how virus and malware scanning software work. List several common or popular brands and types of virus and malware scanning software.	Mod1-240–241
DOMAIN 4.0	**Troubleshooting**	
OBJECTIVE 4.1	**Software**	
IC³-1 4.1.1	Explain the possible dangers and problems that can be caused by software updates and how to resolve them.	Mod1-248–257
IC³-1 4.1.2	Explain the concepts associated with version control of operating system (OS) software. Further explain how the OS version can affect the compatibility of other software on the PC.	Mod1-49
IC³-1 4.1.3	Demonstrate how to identify and remove a virus or other malware from an infected PC.	Mod1-257–260
IC³-1 4.1.4	Explain what 'safe mode' is in popular PC operating systems (OSs), and how and when it should be used when troubleshooting problems on a personal computer system.	Mod1-260–261
IC³-1 4.1.5	Explain where and how to find information beyond that stored on the PC to help troubleshoot problems on a PC. List popular knowledge base, forums, and self-help Web sites and explain how to use them for troubleshooting.	Mod1-249

IC³-1 4.1.6	Demonstrate how to invoke and interpret the information available in a PC's Task, Process, or Application Manager. Further demonstrate how to use this tool when troubleshooting a problem on the affected PC.	Mod1-250–251
OBJECTIVE 4.2	**Hardware**	
IC³-1 4.2.1	Explain how different versions of firmware affect performance of hardware subsystems on a PC and how that information may be used in troubleshooting a problem on a PC.	Mod1-263
IC³-1 4.2.2	Explain the role of cables and other connectors that connect the various parts of a computer together and what can happen when one or more cable or connector does not make the proper connection. Explain how this information may be used in troubleshooting a problem on a PC.	Mod1-263
OBJECTIVE 4.3	**Devices and peripherals**	
IC³-1 4.3.1	Explain how different versions of firmware can affect performance of peripheral devices and hardware attached to a PC and how that information may be used in troubleshooting a problem on a PC.	Mod1-264
IC³-1 4.3.2	Explain the concepts associated with version control of operating system (OS) software. Further explain how the OS version can affect the compatibility of various hardware components on the PC.	Mod1-264
IC³-1 4.3.3	Explain what a device driver is, how it fits into the operating system architecture, and how incompatibilities may lead to problems. Further explain how this information may be used in troubleshooting a problem on a PC.	Mod1-264
OBJECTIVE 4.4	**Backup/restore**	
IC³-1 4.4.1	Demonstrate how to backup and then restore software and data to a safe offsite location.	Mod1-272–276
IC³-1 4.4.2	Explain how to backup and then restore software and data to a storage device, external to, but in close physical proximity to the PC.	Mod1-272–276
IC³-1 4.4.3	Demonstrate how to backup and then restore software and data safely to the cloud.	Mod1-272–282
IC³-1 4.4.4	Explain the implications of versioning and recycling of backups in an incremental backup system. Explain how to properly restore from an incremental backup system.	Mod1-272–276

MODULE 2: KEY APPLICATIONS_GS4 EXAM CORRELATION

STANDARDIZED CODING NUMBER	OBJECTIVES & ABBREVIATED SKILL SETS	PAGE
DOMAIN 1.0	**Common Application Features**	
OBJECTIVE 1.1	**Common features and commands**	
IC³/GS4-2 1.1.1	Keyboard shortcuts	Mod2-14–16 Mod2-55 Mod2-252–255 Mod2-381–383 Mod2-469–471
IC³/GS4-2 1.1.2	Cut, Copy, Paste	Mod2-69–72 Mod2-167–169 Mod2-264–267 Mod2-281–283 Mod2-293–294 Mod2-326–328 Mod2-330–333 Mod2-343–344 Mod2-366–368 Mod2-450–454
IC³/GS4-2 1.1.3	Show/Hide	Mod2-42–44 Mod2-63–65 Mod2-69–72 Mod2-82–98 Mod2-126–129 Mod2-276–281 Mod2-363–366 Mod2-383–384 Mod2-450–452
IC³/GS4-2 1.1.4	Print	Mod2-95–97 Mod2-117–124 Mod2-256–257 Mod2-279–281 Mod2-283–290 Mod2-419–421 Mod2-480–484

IC³/GS4-2 1.1.5	Spellcheck, Find/Replace, Redo Undo	Mod2-67–72 Mod2-78–81 Mod2-259–266 Mod2-368–371 Mod2-450–452 Mod2-469–472
IC³/GS4-2 1.1.6	Drag and Drop	Mod2-5–9 Mod2-69–72 Mod2-167–171 Mod2-225–228 Mod2-233–235 Mod2-238–242 Mod2-366–368 Mod2-375–377 Mod2-450–454
IC³/GS4-2 1.1.7	Preferences, resets, customization	Mod2-17–24 Mod2-37–39 Mod2-42–44 Mod2-106–111 Mod2-114–115 Mod2-191–194 Mod2-197–198 Mod2-204–206 Mod2-250–252 Mod2-404–407 Mod2-432–435
IC³/GS4-2 1.1.8	Help	Mod2-28–30 Mod2-328–329 Mod2-360–363
IC³/GS4-2 1.1.9	Selecting	Mod2-62–67 Mod2-69–72 Mod2-86–94 Mod2-97–98 Mod2-148–174 Mod2-252–255 Mod2-258–269 Mod2-339–342 Mod2-361–368 Mod2-375–377 Mod2-446–454 Mod2-468–469 Mod2-476–479 Mod2-482–484

OBJECTIVE 1.2	Formatting	
IC³/GS4-2 1.2.1	Using Styles	Mod2-93–94 Mod2-162–169 Mod2-188–196 Mod2-217–219 Mod2-228–241 Mod2-297–303 Mod2-306–308 Mod2-343–349 Mod2-371–380 Mod2-397–404 Mod2-440–444 Mod2-446–450 Mod2-462–466
IC³/GS4-2 1.2.2	Basic text formatting	Mod2-76–78 Mod2-86–88 Mod2-97–98 Mod2-167–169 Mod2-371–377 Mod2-401–404 Mod2-462–464 Mod2-482–484
OBJECTIVE 1.3	**Navigating**	
IC³/GS4-2 1.3.1	Open, Close	Mod2-4–13 Mod2-15–16 Mod2-20–27 Mod2-42–48 Mod2-55 Mod2-131–133 Mod2-252–257 Mod2-268–269 Mod2-308–311 Mod2-358–360 Mod2-432–440 Mod2-445–454 Mod2-468–469
IC³/GS4-2 1.3.2	Save vs. Save As	Mod2-25–27 Mod2-40–50 Mod2-129–131 Mod2-252–255 Mod2-258–269 Mod2-306–311 Mod2-358–360 Mod2-368–371 Mod2-436–440 Mod2-441–450 Mod2-450–454 Mod2-485–487

IC³/GS4-2 1.3.3	New file	Mod2-4–10 Mod2-15–16 Mod2-36–37 Mod2-40–41 Mod2-182–187 Mod2-250–252 Mod2-258–259 Mod2-358–360 Mod2-368–371 Mod2-432–435 Mod2-440–444
IC³/GS4-2 1.3.4	Maximize/Minimize/Resize	Mod2-5 Mod2-11–16 Mod2-250–252 Mod2-358–360 Mod2-432–435
IC³/GS4-2 1.3.5	Search	Mod2-28–30 Mod2-50–54 Mod2-72–78 Mod2-81–85 Mod2-252–255 Mod2-392–396 Mod2-415–418 Mod2-450–452 Mod2-469–471
IC³/GS4-2 1.3.6	Views	Mod2-5–9 Mod2-20–27 Mod2-44–54 Mod2-115–117 Mod2-126–133 Mod2-188–191 Mod2-233–241 Mod2-256–257 Mod2-276–287 Mod2-363–371 Mod2-375–383 Mod2-436–440 Mod2-446–450 Mod2-462–466 Mod2-473–484
OBJECTIVE 1.4	**Working with multimedia files**	
IC³/GS4-2 1.4.1	Demonstrate how to adjust the display of pictures, videos, audio, or other multimedia content within an application such as a word processor, spreadsheet, presentation package, database manager, or other software application product according to the action listed in the objective.	Mod2-222–225 Mod2-230–233 Mod2-236–238 Mod2-343–344 Mod2-375–380 Mod2-392–401 Mod2-476–479

IC³/GS4-2 1.4.2	Demonstrate how to incorporate and display pictures, videos, audio, or other multimedia content within an application such as a word processor, spreadsheet, presentation package, database manager, or other software application product according to the action listed in the objective.	Mod2-219–242 Mod2-337–344 Mod2-392–401 Mod2-415–418 Mod2-476–479
DOMAIN 2.0	**Word Processing Activities**	
OBJECTIVE 2.1	**Organizing data**	
IC³/GS4-2 2.1.1	Tables	Mod2-148–174
IC³/GS4-2 2.1.2	Lists	Mod2-93–94 Mod2-171–173
OBJECTIVE 2.2	**Layout**	
IC³/GS4-2 2.2.1	Page Layout	Mod2-88–98 Mod2-154–156 Mod2-161–162 Mod2-164–171 Mod2-194–196 Mod2-198–200 Mod2-214–217 Mod2-233–235
IC³/GS4-2 2.2.2	Spacing	Mod2-88–93 Mod2-97–98
IC³/GS4-2 2.2.3	Indent Text	Mod2-40–41 Mod2-91–94
DOMAIN 3.0	**Spreadsheet Activities**	
OBJECTIVE 3.1	**Spreadsheet layout**	
IC³/GS4-2 3.1.1	Insert/Delete	Mod2-261–263
IC³/GS4-2 3.1.2	Cell sizes	Mod2-263–266 Mod2-291–294 Mod2-300–303
IC³/GS4-2 3.1.3	Alignment	Mod2-257–259 Mod2-292–297
IC³/GS4-2 3.1.4	Navigation	Mod2-260–269 Mod2-281–285 Mod2-291–292 Mod2-321–324 Mod2-331–333 Mod2-335–337
IC³/GS4-2 3.1.5	Merging cells	Mod2-291–292
OBJECTIVE 3.2	**Data management**	
IC³/GS4-2 3.2.1	Filter and Sort	Mod2-303–306
IC³/GS4-2 3.2.2	Formulas and Functions	Mod2-320–331 Mod2-333–337

IC³/GS4-2 3.2.3	Number format	Mod2-294–297 Mod2-326–328 Mod2-331–333 Mod2-335–337
IC³/GS4-2 3.2.4	Cell format	Mod2-291–294 Mod2-297–303
IC³/GS4-2 3.2.5	Charts, graphs	Mod2-337–349
DOMAIN 4.0	**Presentation Activities**	
OBJECTIVE 4.1	**Inserting content**	
IC³/GS4-2 4.1.1	Text	Mod2-368–371 Mod2-375–380 Mod2-401–404
IC³/GS4-2 4.1.2	Table	Mod2-401–404
IC³/GS4-2 4.1.3	Media	Mod2-407–409 Mod2-413–418
IC³/GS4-2 4.1.4	Chart	Mod2-401–404
IC³/GS4-2 4.1.5	Graph	Mod2-392–404
OBJECTIVE 4.2	**Slide management**	
IC³/GS4-2 4.2.1	Add slides	Mod2-366–368
IC³/GS4-2 4.2.2	Delete slides	Mod2-366–368
IC³/GS4-2 4.2.3	Revise slide order	Mod2-366–368
OBJECTIVE 4.3	**Slide design**	
IC³/GS4-2 4.3.1	Layout	Mod2-368–371 Mod2-375–377
IC³/GS4-2 4.3.2	Animations	Mod2-409–415
IC³/GS4-2 4.3.3	Demonstrate how to invoke, remove, and control special effects associated with and defining how slides transition from one to another during the execution of a presentation application slide show.	Mod2-407–409
DOMAIN 5.0	**Basic Database Interactions**	
OBJECTIVE 5.1	**Record managements**	
IC³/GS4-2 5.1.1	Run Reports	Mod2-476–479
IC³/GS4-2 5.1.2	Search and use stored queries	Mod2-473–476
IC³/GS4-2 5.1.3	Input data (records)	Mod2-440–454 Mod2-466–468 Mod2-471–472

OBJECTIVE 6.1	Comments	
IC³/GS4-2 6.1.1	Review comments	Mod2-106–117 Mod2-139–141 Mod2-306–308 Mod2-419–421 Mod2-485–487
IC³/GS4-2 6.1.2	Accept or Reject	Mod2-115–117 Mod2-138–141 Mod2-306–308 Mod2-422–423 Mod2-485–487
IC³/GS4-2 6.1.3	Add comments	Mod2-106–111 Mod2-111–113 Mod2-139–141 Mod2-306–308 Mod2-419–421 Mod2-485–487
DOMAIN 6.0	**Collaboration**	
OBJECTIVE 6.2	**Sharing files**	
IC³/GS4-2 6.2.1	Share using e-mail	Mod2-133–139 Mod2-308–311 Mod2-422–423 Mod2-485–487
IC³/GS4-2 6.2.2	Network storage	Mod2-133–139 Mod2-308–311 Mod2-422–423 Mod2-485–487
IC³/GS4-2 6.2.3	Cloud	Mod2-133–139 Mod2-308–311 Mod2-422–423 Mod2-485–487

MODULE 3: LIVING ONLINE_GS4 EXAM CORRELATION

STANDARDIZED CODING NUMBER	OBJECTIVES & ABBREVIATED SKILL SETS	PAGE
DOMAIN 1.0	**Browsers**	
OBJECTIVE 1.1	**Internet vs. Browsers vs. WWW**	
IC³/GS4-3 1.1.1	Concepts about each	Mod3 84–85 Mod3-88–101 Mod3-105–107
IC³/GS4-3 1.1.2	Differences between each	Mod3-80–81
IC³/GS4-3 1.1.3	Uses of each	Mod3-82–87 Mod3-89–100 Mod3-105–109
OBJECTIVE 1.2	**Navigation**	
IC³/GS4-3 1.2.1	Domains	Mod3-80–81
IC³/GS4-3 1.2.2	Hyperlinks	Mod3-80 Mod3-89–96
IC³/GS4-3 1.2.3	Home page	Mod3-89–96
IC³/GS4-3 1.2.4	Back, forward, refresh	Mod3-89–97 Mod3-101–104
IC³/GS4-3 1.2.5	Favorites/Bookmarks	Mod3-89–97 Mod3-101–104
IC³/GS4-3 1.2.6	Plug-ins	Mod3-98–99
IC³/GS4-3 1.2.7	History	Mod3-101
IC³/GS4-3 1.2.8	Search	Mod3-86–87 Mod3-116–122
IC³/GS4-3 1.2.9	Tabs	Mod3-94–96
IC³/GS4-3 1.2.10	Downloading/Uploading	Mod3-84–85
DOMAIN 2.0	**Networking Concepts**	
OBJECTIVE 2.1	**Internet connection**	
IC³/GS4-3 2.1.1	Speed	Mod3-82–85
IC³/GS4-3 2.1.2	Wired	Mod3-82–84
IC³/GS4-3 2.1.3	Wireless	Mod3-82–85 Mod3-105–109
IC³/GS4-3 2.1.4	Security	Mod3-105–109

OBJECTIVE 2.2	**Network types and features, capabilities**	
IC³/GS4-3 2.2.1	Publicly switched networks	Mod3-4–5
IC³/GS4-3 2.2.2	DNS (Domain Name Server)	Mod3-12–13
IC³/GS4-3 2.2.3	Addressing	Mod3-12–13
IC³/GS4-3 2.2.4	LAN vs. WAN	Mod3-6–7
IC³/GS4-3 2.2.5	VPN	Mod3-5
OBJECTIVE 2.3	**Network troubleshooting**	
IC³/GS4-3 2.3.1	Solve simple scenarios	Mod3-16–18
IC³/GS4-3 2.3.2	Identify common problems	Mod3-16–17
IC³/GS4-3 2.3.3	Define IP addressing	Mod3-12–13
DOMAIN 3.0	**Digital Communication**	
OBJECTIVE 3.1	**E-Mail communication**	
IC³/GS4-3 3.1.1	E-mail Account Settings	Mod3-25
IC³/GS4-3 3.1.2	Appropriate use of e-mail	Mod3-30–35 Mod3-43–45 Mod3-54
IC³/GS4-3 3.1.3	Managing e-mail communications	Mod3-26–31 Mod3-38–42 Mod3-44–53
OBJECTIVE 3.2	**Real-Time communication**	
IC³/GS4-3 3.2.1	Text communication	Mod3-63–65
IC³/GS4-3 3.2.2	Audio Visual communication	Mod3-64–65
IC³/GS4-3 3.2.3	Telepresence (Social Media)	Mod3-61–62
DOMAIN 4.0	**Digital Citizenship**	
OBJECTIVE 4.1	**Communication standards**	
IC³/GS4-3 4.1.2	All capitals vs. standard capitalization	Mod3-63–64
IC³/GS4-3 4.1.3	Verbal vs. Written, Professional vs. Personal communication	Mod3-72–73 Mod3-74–75
IC³/GS4-3 4.1.4	Spamming, flaming, bullying	Mod3-73
IC³/GS4-3 4.1.5	Libel, slander	Mod3-73
OBJECTIVE 4.2	**Legal and responsible use of computers**	
IC³/GS4-3 4.2.1	Censorship	Mod3-165–166
IC³/GS4-3 4.2.2	Filtering	Mod3-155
IC³/GS4-3 4.2.3	Intellectual property	Mod3-124 Mod3-166

IC³/GS4-3 4.2.4	Piracy	Mod3-166
IC³/GS4-3 4.2.5	Copyright use	Mod3-124 Mod3-166
IC³/GS4-3 4.2.6	Licensing	Mod3-166–167
IC³/GS4-3 4.2.7	Creative Commons	Mod3-125
DOMAIN 5.0	**Safe Computing**	
OBJECTIVE 5.1	**Secure online communication or activity**	
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GLOSSARY

A

absolute cell reference A reference that does not change when the formula is copied or moved to a new location.

access time The average number of milliseconds (ms) it takes a computer to retrieve data from the storage device.

accessibility Features that make a computer easier to see, hear, and use.

account A collection of applications, preferences, and other settings for a single user.

activate To provide information such as a serial number to ensure that you are installing software only on the number of computers specified in the software license.

active cell The currently selected cell in a worksheet.

adapter card A circuit board that can be plugged into an expansion slot on the motherboard of a desktop or server computer.

address A unique identifier applied to each device on a network.

Administrator account A user account created when Windows is installed to provide full access to the computer.

algorithm A set of rules a program follows in calculations or other problem-solving steps.

alignment How text is positioned between the left and right margins.

all-in-one desktop A desktop computer that houses the processing components in the same case that holds the monitor.

Android An open-source operating system derived from Linux and designed to run on many types of smartphones and tablets.

animation Special visual or sound effects added to text or an object.

app A Windows 8 application, which is an application that takes up the entire screen when it runs and provides a clean, uncluttered workspace for viewing information.

application file A necessary file for running an application.

Application Service Provider (ASP) Provides remote access to software applications hosted on the Internet.

application software The software you use most directly to perform tasks, such as writing a report.

application window The main window that serves as the primary interface between the user and the application.

archiving The process of backing up your e-mail messages.

argument A value, a cell reference, a range, or text that acts as an operand in a function formula; it is enclosed in parentheses after the function name.

ascending order Alphabetical order from A to Z, or numerical order from lowest number to highest number.

aspect ratio The ratio of width to height.

Assistive technologies Software and devices used to maintain, increase, or improve the functional capabilities of individuals with disabilities.

audio input Sound entered into a computer, such as speech, sound effects, and music.

automatic update An update that automatically checks for software updates and then downloads them when they are available.

AutoShape A predesigned drawing object, such as a star, an arrow, or a rectangle.

B

backstage view A feature that provides quick access to common tasks for managing documents, such as saving, opening, and printing.

backup A duplicate copy of a file that you can use if the original file is lost, damaged, or destroyed.

backup plan A plan that follows a regular schedule for creating different types of backups.

backup software A set of system utilities for creating and updating backups and for restoring files from a backup.

bad sector A sector on a disk that does not record data reliably.

banded columns Even-numbered columns that are formatted differently than odd-numbered columns.

banded rows Even-numbered rows that are formatted differently than odd-numbered rows.

banner A headline that spans the full width of the page, such as the title for newsletter columns.

bar code A matrix or series of lines with varying widths and heights that represents letters and numbers.

binary Understanding only two states—off and on, represented by 0 and 1.

biometrics A security technique using automated methods of recognizing a person based on a physical characteristic.

bit The smallest unit of data a computer can process; short for *binary digit*.

blog Short for "Web log," a Web site where one or more authors regularly post commentaries, opinions, and other personal information for public viewing and comment.

boilerplate text Content that is frequently used in documents.

Boolean logic search Uses three primary logical operators AND, OR, and NOT to define the search.

boot process A series of steps the computer and operating system must complete before you can interact with the operating system.

bot A program that runs repetitive tasks.

browser plug-in Also referred to as an add-on; optional software that adds functionality to a Web browser.

buffer Part of memory or storage where data waits until it can be transferred to a device.

building block A document part that is already designed and formatted.

bus A sequence of electronic circuitry used to transfer data among computer components.

business-to-business (B2B) Describes e-commerce transactions between businesses, such as between a company and a supplier.

business-to-consumer (B2C) Describes online transactions between businesses and consumers.

business-to-government (B2G) Describes online transactions between businesses and governmental agencies.

C

cable modem A network device that uses existing cable television lines to send and receive data.

cache memory High-speed RAM (random access memory) that serves as a temporary storage area for data and is continually updated.

case sensitive When entering a password, the upper- and lowercasing of the letters must be identical to the casing of the letters in the assigned password.

cell The point where a column and a row intersect in a table or a spreadsheet.

cell reference Identifies the column letter and row number in a worksheet (for example: A1 or B4).

cell style A set of predefined formats you can apply to some of the worksheet data.

central processing unit (CPU) A single computer chip that contains all the electronic circuitry for performing a personal computer's processing tasks. Also called a processor and a microprocessor.

channel The media that carries or transports the message, such as the radio signal or the coaxial cable.

character style A style that provides text formats such as font name, font size, font color, bold, italic, underline, borders, and shading.

charm A button on the Charms bar.

Charms bar A bar that appears in Windows 8 when you point to the upper-right or lower-right corner of the screen.

chart A graphic representation of worksheet or table data.

chatting Talking to other people in real-time on the Internet; most commonly, the "talk" is created with typed messages, but a chat can also be conducted using sound or sound and video.

chip A small, thin piece of silicon containing electronic circuits. Also called an integrated circuit (IC).

click To press the left mouse button.

client A computer that accesses the shared resources, services, and programs provided by the server.

client/server network In this network design, one or more computers on the network act as a server; the computer providing the service is the server, and the computer that requests and uses the service is the client.

clip A segment of a video or other media.

clip art A graphic that is ready to insert in a document.

Clipboard A temporary storage area in your computer's memory for files and content that is accessed when you copy or move data.

cloud computing Online computing services for storing, managing, and processing data.

cluster Each part of a file stored in a sector.

collating Printing all the pages in one copy of a document before printing the next copy so that the printed pages are automatically arranged in the proper sequence as they print.

color scheme A set of coordinated colors.

column heading The letter at the top of the column in a worksheet.

command-line interface A user interface that requires you to type text commands as you interact with the operating system.

comment An annotation that the author or a reviewer adds to a document; it is not part of the text but is viewable in the margin or in a separate pane, and it can be printed with the document.

communications protocol A description of the rules computers must follow to facilitate device identification and data transfer.

complex formula An Excel formula containing more than one operator.

computer An electronic device that receives data (input), processes data, stores data, and produces a result (output).

computer-aided design (CAD) A special type of 3D graphics software used by professional designers to create models of products, buildings, and other objects; engineering and technical drawings; and blueprints for architectural projects.

computer literate Having the ability to use today's computer hardware and software efficiently to enhance your life and the lives of those around you, and understanding a wide range of information about current computer technology and how it's used to solve problems.

conditional formatting Applies designated formats to cells when the cell value meets specified conditions (criteria).

contextual tab A tab on the Ribbon that appears only when you are performing certain tasks, and contains options related to your current task.

Control Panel A window containing specialized tools you use to change the way Windows looks and behaves.

conversation Sometimes referred to as the message thread; the complete set of e-mail messages that includes the original message and all the responses.

convertible tablet A tablet computer that uses a hybrid design that includes a swivel screen or removable keyboard so you can use the computer as a laptop or tablet.

cookie A small text file that a Web server puts on your computer to store information about you and your preferences.

copy To place a duplicate of a file in a new location that you specify.

copyright The exclusive right, granted by law for a certain number of years, to make and use literary, musical, or artistic work.

credentials Information that authenticates your identity when you log on to a Web site or an Internet service, such as a username and a password.

critical thinking The process of analyzing, combining information, and evaluating information as a guide to making judgments.

crop To cut off portions of a graphic that you do not want to show.

crowdsourcing Combines the collective effort of many people to complete a task; needed services and ideas are solicited from an online community instead of from employees or suppliers.

cursor A vertical blinking line in the document window that indicates the location where new text and data will be entered.

cyberbullying Using Internet technology to intentionally harass, threaten, embarrass, or target another person.

D

data A collection of raw, unprocessed facts, including text, numbers, sound, images, and video.

data file A file created by an application.

data transfer rate A measurement that determines how much data the storage device can move per second from the storage media to the computer.

data type A field property in Access that determines the type of data a database field can store.

database A collection of related data organized into tables for rapid search and retrieval.

datasheet A database table that stores subject-based data; the primary object in a database.

default (1) A setting that is automatically used unless another option is chosen. (2) In any given set of choices, the choice that is preselected, the selection that is in effect when you open an application, or the settings established during the installation process.

defragmenter A type of disk management tool that optimizes the way files are stored on the disk.

descending order Alphabetical order from Z to A, or numerical order from highest number to lowest number.

desktop In Windows, the main work area for running productivity applications, especially those created for earlier versions of Windows, such as Windows 7.

desktop application In Windows 8, a program that opens and runs in a window on the desktop.

desktop computer A computer that fits on or next to a desk, is designed to be stationary, and runs on power from a wall outlet.

desktop publishing The process of creating a document using a computer to lay out text and graphics.

differential backup A type of backup that copies only the files that have changed since the last full system backup.

digital certificate An electronic document that verifies the identity of a person or company and confirms that they own a public key.

digital divide An economic gap between those who are computer literate and enjoy access to computer technology and those who do not.

digital light processing (DLP) A technology that bounces light off microscopic mirrors on a computer chip.

digital subscriber line (DSL) A modem that uses an Internet connection technology that transfers information to a computer at a high-speed bandwidth over ordinary copper telephone lines.

digital video (DV) camera A type of camera you can use to send live images over the Internet, make video telephone calls, and send e-mail messages with video attachments.

direct-access storage A storage method that allows a data-retrieval mechanism to quickly find data.

disk A storage device for digital data.

disk cleaner A type of disk management tool that identifies files you can safely delete to free up disk space.

disk management utility A type of utility software that helps the operating system store files efficiently on a disk and removes unnecessary files.

disk scanner A type of disk management tool that scans for disk errors, and then repairs them. Also called an error-checking tool.

document template A file that contains document settings, content, and formats that are available only to documents based on that template.

document window The area in an application window where you enter new text and data or change existing text and data.

domain A group of computers and devices on a network that are administered as a unit with common rules and procedures.

domain name An address of a computer network connection that identifies the owner of the address (such as an organization or company name).

Domain Name Server (DNS) Maintains a directory of domain names and their correlated IP addresses; also translates a Web address to an IP address and directs your Internet connection to the corresponding Web site.

drag-and-drop editing Using the mouse to move selected content from its existing location and placing it in a new location.

drawing canvas Provides a frame-like boundary between a drawing and the rest of the document and keeps your shapes together as one object.

drawing object A shape, curve, or line used to create your own graphic.

drive Hardware that can retrieve and usually record data on a disk.

driver A small program that enables the operating system to interact with a hardware device.

duplex printing Printing on both sides of the paper.

E

e-book reader A mobile computing device you use to download and read electronic versions of printed books, magazines, and newspapers.

e-commerce (electronic commerce) Business conducted on the Internet.

edit To modify or adapt a text or object by make revisions or corrections.

electronic paper display The type of display screens used by e-book readers; they consume less power and provide higher contrast in bright light than LCDs.

embedded chart A chart created on the same sheet as the data used in the chart.

embedded computer A processor built into a household appliance or other device such as an ATM, navigation system, refrigerator, television, or other consumer electronics.

embedded operating system An operating system included in the hardware of a device, and that is designed to run the device for a specific purpose and a single type of task with little or no intervention from users.

emphasis effect A setting used to draw attention to an object that is already visible on a slide in a PowerPoint presentation.

encryption A security method that encodes data so that only authorized people can access it.

end user license agreement (EULA) The document that displays when you begin installing software, summarizing the software license and the terms and guidelines for your legal use of the software.

enterprise server A server used by large corporations to provide employees access to special software used to run the company's business.

entrance effect A setting used to control how an object enters onto a slide in a PowerPoint presentation.

entry Data entered in a datasheet cell.

ergonomic Hardware or other product designed to provide comfort and avoid stress to the human body during usage.

Ethernet cable The most common type of connection used to connect devices in a local network; looks much like a regular phone jack, but it is slightly wider.

executable file A file that can perform tasks automatically when you open it.

exit effect A setting used to control how an object leaves a slide in a PowerPoint presentation.

expansion card A circuit board that can be plugged into an expansion slot on the motherboard of a desktop or server computer.

ExpressCard module Hardware that portable computers use to connect peripheral devices to slots or ports that you can access outside of the system unit.

external hard drive A separate, freestanding high-capacity storage device that you attach to a computer, usually using a USB port.

extranet Similar to an intranet, this type of network allows specific users outside of the organization access to internal information systems in an intranet.

F

field In Access, a single characteristic of a person, place, thing, or event; in Word, PowerPoint, and Publisher, an indication of a location in which variable text or data can be inserted.

field name A label that helps identify the field.

field property A definition of the characteristics and behavior of a database field.

file A collection of information saved as a unit.

file attribute A file detail or setting that can be turned on or off.

file compatibility The ability to open and work with files without a format conflict.

File Explorer The file management tool provided with Windows 8.

file extension Three or four characters automatically added to the filename when the document is saved; a period separates the filename and the extension, which identifies the type of file.

file path A notation that indicates where a file is stored and includes the drive name and letter, folder and subfolders, and full filename.

file server A server used by small businesses to share files and programs among employees.

file system The hierarchy of folders and files an operating system uses to organize files.

file type (file format) The characteristic of a file that determines the type of data it contains.

file utility A type of utility software that helps you manage files, convert files from one format to another, or thoroughly delete files.

filter To screen for data matching specified criteria.

filtering Used to block content coming into and going out to the Internet.

firewall Blocks unauthorized access or use to or from a network based on the specified security criteria.

FireWire (IEEE 1394) A bus standard developed by Apple as a high-speed method for connecting multimedia devices such as video cameras to a computer.

first line indent When only the first line of the paragraph is indented.

flaming An intense, online verbal argument.

folder A container used for organizing files into manageable groups.

font The design of a typeface.

footer Information or graphics that print in the bottom margin of the page.

form A database object that provides a convenient way to enter, edit, and view data from a table.

format To change the appearance of the text or of the whole document.

Format Painter A Microsoft Office feature used to quickly copy and apply font and paragraph formatting as well as some basic graphic formatting, such as borders, fills, and shading.

formatting The appearance and arrangement of elements on a page.

formula A mathematical equation using numbers and cell references to perform calculations.

frame In desktop publishing software, a movable rectangular area on a page in which you enter text and graphics.

freeware Copyrighted software the developer makes available to users free of charge, or for a voluntary fee.

freeze To lock a row or column to keep an area visible as you scroll through the worksheet.

full system backup An exact duplication of the hard drive, including data files, system files and settings, application files, and the operating system.

function A predefined formula that names a function instead of using operators to perform common calculations.

G

gateway A computer or dedicated hardware device that connects networks using different communications protocols so that information can be passed from one network to another.

gigabyte (GB) About 1 billion bytes, with each byte roughly equivalent to a character of data.

global template A file that contains document settings that are available to all documents.

grammar checker A feature of a word-processing application that marks common grammar errors such as incomplete sentences and suggests corrections.

graphical user interface (GUI) An interface that uses icons and other graphics to accept data and commands.

graphics Items other than text, such as digitized photographs, scanned images, and pictures.

gridline A boundary line used for layout purposes in a table; it is displayed onscreen, but does not print.

group policy A setting that affects how Windows works and what rights and permissions user accounts have.

H

handheld game device A mobile device designed for a single video game player to use at one time.

hanging indent The first line of text begins at the left margin and all other lines of the paragraph hang, or are indented, to the right of the first line.

hard copy A printed copy of a document.

hard disk A disk that is permanently stored in a computer.

hard drive The main storage device in a computer; also called a hard disk drive.

hardware Physical components such as wires, transistors, and circuits and electronic devices such as a computer, printer, and monitor.

hardware firewall Protects against unwanted access to or from all the computers in a network from one point.

header Information and/or graphics that print in the top margin of the page.

header row The first row in a table or data source with the column headings.

hibernation A power state that saves your work to your hard disk, reduces the power for a specified amount of time, and then turns off your computer.

home page The first page that appears in the browser when you visit a Web site; your opening to the WWW.

hotspot Provides Wi-Fi network access (usually Internet access) to a small area for wireless-enabled devices such as laptops, tablets, and smartphones.

HTML (Hypertext Markup Language) format The default format in Outlook that supports text formatting options such as multiple fonts, bold text, colored headings, graphics, and links to Web sites.

hub A network device that joins all the devices of a network together; every network device connects directly to the hub through a port; when a frame of data arrives from a connected device, the hub forwards the frame to all the other connected devices.

hybrid sleep A power state that saves your data on the hard disk before putting your computer to sleep.

hyperlink Also referred to as a link; automatically connects you to another part of the same Web page or to another Web page.

Hypertext Markup Language (HTML) The main markup language used to create Web pages; HTML defines the format and layout of a Web document.

Hypertext Transfer Protocol (HTTP) The underlying protocol for the Web.

I

I-beam The mouse pointer shape (which looks like a capital letter I) when the mouse is positioned within the document window.

icon A small onscreen picture.

incremental backup A type of backup that copies the files that have changed since the last full system backup or the last incremental backup.

incremental search A search that returns matches for the string of characters you type in a search box; as the search text is augmented, the matches for the searched text in the document change.

indent A space inserted between the margin and where the line of text appears.

information Data processed into a meaningful form.

information processing cycle The series of steps that includes input, processing, output, and storage.

inkjet printer A nonimpact printer that creates text and images by spraying ink onto paper.

input device A peripheral device you use to enter data and commands into the computer.

Insert mode In this default mode, when you enter new text in front of existing text, the existing text shifts to the right to make room for the new text.

insertion point A vertical blinking line in the document window that indicates the location where new text and data will be entered.

install To move a copy of the software from its distribution location to your computer.

Integrated Services Digital Network (ISDN) A service that can send voice, video, and data over digital or analog telephone lines.

intellectual property The recognition of the ownership of rights to literary, musical, or artistic work.

interactive whiteboard A computer program that allows participants in a video conference to interact and make changes to a document.

Internet A worldwide system of linked computers.

Internet censorship The suppression of Web content that is considered offensive or a threat to security.

Internet service provider (ISP) An organization or company that provides connectivity to the Internet through a telecommunications line or wireless system.

intranet A type of network designed for the exclusive use within an organization.

iOS A version of Mac OS X written for Apple's mobile devices.

IP address Identifies the host device and the network to which it belongs; usually assigned by the network administrator or the Internet service provider.

J

Jump List A collection of links that provides quick access to files and data.

K

keylogger A malicious program that records keystrokes.

keyword A word that describes the information the user is trying to locate.

knowledge base A collection of articles, videos, and other sources containing information about a product or topic.

L

landscape orientation A page layout in which the content of the document is formatted with the long edge of the page at the top.

laptop computer A lightweight mobile computer about the size of a paper notebook that includes the system components, keyboard, pointing device, and display screen in a single unit.

laser printer A nonimpact printer that produces text and images using the same technology as copier machines.

layout A pre-set arrangement for slide content, including text and graphics that provide placeholders in which you can enter and edit text in formats that audiences can view and read easily, including headings, bulleted and numbered lists, and graphics.

libel A written communication that is an untrue statement that can damage a person's or a company's reputation or character.

library An organizational tool for folders and files that displays similar types of files together, no matter where they are stored on the computer.

linked style A style that provides either text or paragraph formats, depending on the content that is selected when the style is applied.

Linux A personal computer operating system related to UNIX.

liquid crystal display (LCD) A technology that manipulates light within a layer of liquid crystal cells to produce an image.

local area network (LAN) Connects computers, workstations, and other devices that are relatively close to each other, such as printers and scanners within a confined space, such as an office building, school, or home.

local backup A backup created with the computer containing the files you want to backup and stored on removable media or a network folder.

local-only user account A user account that lets you access only resources on your computer.

localize To use settings appropriate for a particular geographical or cultural location.

logic bomb A virus triggered by the appearance or disappearance of specified data.

lossless compression A type of file compression that reconstructs the original file without losing any data.

lossy compression A type of file compression that permanently removes data identified as unnecessary in the file.

lost cluster A file system error that occurs if the operating system loses track of which clusters contain the data that belongs to a particular file.

M

Mac OS X The operating system designed to run on the Macintosh computer.

mainframe computer A powerful computer designed for intensive data processing for hundreds or thousands of users at the same time.

malware Short for "malicious software," software (including computer viruses, worms, Trojans, bots, and spyware) that is designed to cause damage to a single computer, server, or computer network.

manual column break A command inserted by the user to adjust where a column ends.

manual line break A paragraph mark inserted by the user to force a line break at a specific location and thereby create a new paragraph.

manual page break A command inserted by the user to force a page break at a specific location.

manual update A software update you download and install yourself.

margin The blank space around the edges of the page.

markup The revision marks and comments that display in a document.

mathematical function A function that performs calculations that you could perform using a scientific calculator.

Media Access Control (MAC) An address for communications on the physical network segment; assigned by the manufacturer of the device.

merging cells Combining multiple cells by removing the boundaries between the cells, usually done to allow a title or informational text to span multiple columns.

meta tag An HTML coding statement that describes some aspect of the Web page content.

metadata Data that describes other data.

metasearch engine Sends queries to several other search engines.

Microsoft account A type of user account that lets you access Microsoft cloud computing services as well as your local computer resources.

minimized The state in which an application is still running, but the application window is no longer displayed on the screen.

mixed cell reference A cell reference that contains both relative and absolute references.

mobile app Software specifically designed for a handheld computer, such as a tablet or smartphone.

modem A network device that enables a computer to transmit data over telephone lines.

monitor The display device used on desktop computers.

motion path A setting used to create a path for an object to follow on a PowerPoint slide.

mouse A pointing device that fits comfortably in the palm of your hand. You move a mouse on a smooth horizontal surface to control the pointer on the screen.

Mouse Mode The default mode in Microsoft Word and other Office applications that places buttons close together on the Ribbon.

move To remove a file from its current location and place it in another location you specify.

multicore processor A single chip that contains more than one processor, and includes dual-core processors (two processors on one chip) and quad-core processors (four processors on one chip).

Multimedia Messaging Service (MMS) Extends the core capability of SMS and enables you to send messages that include multimedia content.

multiprocessing An operating system technique that splits tasks among processors so that each processor can work on a different task at the same time.

multitasking Working with more than one program at the same time.

multithreading A technique that allows the operating system to handle many parts (threads) of a single program.

multiuser operating system An operating system that lets many users simultaneously run programs and take advantage of the computer's resources.

N

native file format The default file type created by an application.

netbook computer Similar to a laptop computer, but smaller and lighter, with less power and storage capacity, lacking a CD/DVD drive, and providing a smaller keyboard and display screen than laptops, but including batteries that hold a charge longer.

netiquette Refers to good manners and proper behaviors when communicating through electronic media.

network A group of two or more computers linked together.

network adapter A card installed on the motherboard that connects a server to a network or the Internet.

network interface card (NIC) A network device that makes the electrical and electronic connections between a computer and a network; usually built into the computer motherboard or installed as an expansion card.

Normal.dotm template A file containing default styles and customizations that determine the structure and page layout of a document.

notebook *See* laptop computer.

notification An onscreen message from Windows or an application.

O

online backup A backup created directly on a secure server.

online forum A Web site where people conduct conversations by posting messages.

open To load a file into an application.

open-source software Software that anyone can use, modify, and distribute.

operand A number or cell reference.

operating system Software that coordinates the resources and activities on a computer.

operator A symbol that indicates the mathematical operation to perform with the operands.

optical storage device A device that uses lasers to read and write data on plastic platters that contain a metal layer, which reflects the laser light back to a sensor in an optical drive.

order of evaluation The sequence used to calculate the value of a formula.

outcrop To add extra white space around a graphic.

Outline tab Shows the text on each slide and enables you to edit text and navigate and organize the slides in the presentation.

Overtype mode In this mode, new text replaces existing characters.

P

packet switching Splits data into manageable packets (small pieces), allowing a more efficient flow in the transmission of the data.

page The amount of data and instructions the operating system can swap at one time.

paragraph style A style that provides both text formats and paragraph formats such as line spacing, text alignment, indentation, and tab stops.

parallel processing An operating system technique that allows two or more processors to work together to complete a single task.

password A series of letters, numbers, spaces, and symbols that you provide to access your files, applications, and other resources on the computer.

patch A small program that corrects or enhances existing software.

path The route the operating system uses to locate a document; the path identifies the disk and any folders relative to the location of the document.

PC platform A personal computer that includes a processor made by Intel or AMD and runs the Windows operating system.

peer-to-peer network (P2P) In this network design, all the computers are equal and no computer is designated as the server; all computers can act both as a client and a server.

performance How efficiently hardware and software perform tasks.

permission A condition that allows a user account to access a file, folder, or other object.

personal computer A computing device that can perform input, processing, output, and storage activities on its own and is designed to be used by one person at a time.

phishing A fraudulent attempt to steal one's personal information to commit identity theft.

pin To add a shortcut to a folder or application on the Start screen or other location.

pixel The smallest surface area that can contain color on a display device; short for *picture element*.

placeholder text Provides guidance for adding text, pictures, tables, or charts to fields.

plagiarism Claiming someone else's words as your own.

Plain Text format A text format with no colors, hyperlinks, or graphics.

playlist A list of songs or other media organized in sequence.

Plug and Play An operating system feature that finds and installs a device driver for new hardware so you can use the new hardware right away.

podcast A method of publishing files (primarily audio) to the Internet so they can be downloaded for playback on a computer or a mobile device.

point The unit of measure for fonts. The larger the point number, the larger the font size. (One inch equals approximately 72 points.)

point-of-sale (POS) system A terminal used for electronic processing of payment transactions in a retail outlet.

pointing device An input device you use to position the pointer on the screen.

pointing stick A pressure-sensitive device that looks like a pencil eraser and is located on the keyboard, generally between the G, H, and B keys.

port A connecter located on the system case that you use to plug peripheral devices into the computer.

Portable Document Format (PDF) A format developed by Adobe Systems designed to preserve the visual appearance and layout of each page and enable fast viewing and printing.

portable media player A mobile device that can store digital media such as songs, videos, and photos, typically on a small hard drive.

portal A Web site that features useful content but also contains links to other sites.

portrait orientation A page layout in which the content of the document is formatted with the short edge of the page at the top.

power plan A collection of hardware and system settings that manages how your computer uses and conserves power.

power state A set of conditions that determines how much power the computer is using.

power surge A boost to the electrical charge that powers the computer, and can occur during lightning storms, power outages, short circuits, and other disruptions to a computer's power source.

presentation The document file in PowerPoint.

primary key A field that uniquely identifies each record in a table.

print queue A feature that shows information about documents that are waiting to print.

problem report A copy of the error data, which includes details about the problem, such as the name and version of the application, when the error occurred, and technical information about the state of the system at that time.

processor A single computer chip that contains all the electronic circuitry for performing a personal computer's processing tasks.

program Software that provides instructions to the hardware so it can perform tasks.

projector An output device that connects to a computer and projects images onto a wall screen or other large, flat surface; also called a data projector.

property A characteristic of an object such as a file.

protocol A rule that governs the transfer of data and ensures that information created by one system can be interpreted and read by another user agent.

public domain Literary, musical, or artistic work that is available for anyone to copy or use.

public domain software Software that the developer has donated for public use or for which the copyright has expired; it is the only type of software that is not copyright-protected.

public switched network (PSN) A common carrier network that provides connections among public users.

public switched telephone network (PSTN) The international collection of interconnected voice-based public telephone networks.

Q

quarantine A location on your computer where suspicious files are stored safely.

query In a database, a request for specific data that meets set criteria.

Quick Tables Built-in tables with sample data and table formats.

R

Radio Frequency Identification (RFID) reader An input device that scans the codes stored in an RFID tag.

random access memory (RAM) Memory the computer uses to store instructions and data temporarily.

range A group of adjacent cells selected in a worksheet. All cells in a range touch each other and form a rectangle.

read-only document A document in which users can open and view the document, but they are unable to make any changes to it.

real-time communications Communications that occur instantly or without noticeable delay.

record A group of related fields in a database table.

Recycle Bin An area on your hard disk that holds deleted files until you remove them permanently.

redundancy Creating more than one copy of a backup.

registry A database of information about the configuration of a Windows computer.

related search Preprogrammed queries or questions suggested by the search engine that often lead to other Web pages containing similar information.

relational database A database in which information is organized into separate subject-based tables, and the relationship of the data in one or more tables is used to bring the data together.

relative cell reference A cell reference that will be adjusted relative to the formula's new location when a formula is copied or moved to a new location.

remote backup A backup created directly on a secure server.

removable media Disks that you insert or attach to a computer.

report A database object which allows you to organize, summarize, and print all or a portion of the data in a database.

resizing Stretching or shrinking the dimensions of an object.

resource Any component a computer system requires to do work.

restore To copy a backup file to its original location on your computer.

reverse printing Reverses the order of the pages so that the last page of a document prints first.

RFID tag A tiny chip with a radio antenna that can be attached to almost anything, including products, price tags, and shipping labels.

Ribbon A banner in the Office Fluent user interface that organizes commands in logical groups presented on tabs.

Rich Text Format A text format similar to HTML that enables you to apply text formats including fonts, paragraph alignment, bulleted lists, and hyperlinks; only supported by Microsoft e-mail applications.

right A task a user account is allowed to perform. For example, the Administrator account has full rights to install software.

root directory Where Windows stores folders and important files that it needs when you turn on the computer.

router A network device that directs the flow of data from a local area network (LAN) to another network connection, either a LAN or a WAN.

row heading The number at the left of the row in a worksheet.

S

Safe mode A troubleshooting option for desktop operating systems that starts your computer with only basic services and functionality.

save To store a document on a disk or other storage medium.

scalability The ability to increase processing capacity to handle additional data.

scanner A device that can change images into codes that the computer accepts as input.

screen resolution The number of pixels displayed on a screen.

screen saver An animated design or image that appears after the computer has been idle for a specified amount of time.

ScreenTip A small window with descriptive text that displays when you position the mouse pointer on a command or control in the application window.

scroll To move text and content vertically or horizontally on a display screen when searching for a particular section, line, option, and so on.

scroll bar An on-screen object that contains arrow buttons and a box you can use to scroll the screen right and left or up and down.

search directory Also referred to as a Web directory; a collection of Web sites organized by category, and then often further organized by geographic region.

search engine A program that searches documents for specified keywords and then provides a list of the sources where the keywords were found.

section An area within a document that can have its own separate page formats.

section break A formatting code that divides the document into multiple sections and controls the section formatting of the text that precedes it.

sector A block of 512 bytes in a track on a disk.

Secure Sockets Layer (SSL) Technology that encrypts sensitive information and authenticates servers and clients to ensure a secure connection.

select To point to an object and then press and release the primary mouse button; also to identify blocks of text or objects you want to edit.

selective backup A backup for which you select the folders and files you want to back up.

server A computer that provides network services such as sharing files and folders.

server operating system An operating system that resides on a server computer and is used to manage a network.

service pack A collection of updates, fixes, or enhancements to software delivered as a single file.

setup program The program that guides you through the steps of installing software and prepares the software so you can use it on your computer.

shareware Noncommercial copyrighted software distributed free of charge, usually for a trial period; after the trial period, the license generally requires that users pay a fee for continued use.

Short Messaging Service (SMS) Technology that initiated the development and growth of text messaging, and provides the capability for text messaging by phone, Web, or mobile communication systems.

shortcut An icon or tile that provides a quick way to perform an action such as opening a folder.

shortcut menu A list of commonly performed commands that appears when you right-click an object on the screen.

sidebar A short article, often appearing in a box, that appears alongside a main article or other content to provide additional explanation or supporting material.

sign in To identify yourself to the operating system.

signature Consists of text or graphics that you create so Outlook can automatically add it to the end of any outgoing messages.

single-user license A software license that gives only one person the right to install and use the software.

site license A software license that allows multiple users to access the software at the same time.

sizing handles Small circles and squares on the border of an object indicating that it is selected.

SkyDrive A free, online storage space for storing and sharing files on a Microsoft server, accessible to users with registered Microsoft accounts.

slander An oral communication that is an untrue statement that can damage a person's or a company's reputation or character.

sleep A low-power state that serves as an alternative to shutting down a computer.

slide A single page of a presentation.

slide layout The arrangement of placeholders on a slide.

Slide Master The main slide that stores information about the theme and layouts of a presentation.

slide pane A pane in the presentation window that contains the slide content.

slide transition A setting that determines how a slide is introduced as you move from one PowerPoint slide to another in Slide Show view.

Slides tab Shows a thumbnail for each slide in the presentation file.

SmartArt graphics Built-in, predesigned, and formatted layouts which you can use to illustrate concepts and ideas.

smartphone A cell phone that includes many features of a computer, such as an operating system and the ability to connect to the Internet.

social media A term used to describe a variety of Web-based platforms, applications and technologies that enable people to keep in touch with friends, find people with similar interests, and build relationships online.

soft copy A digital copy of data.

soft page break A page break that is automatically inserted when you fill a page with text or graphics.

software Instructions, or programs, for controlling a computer.

Software as a Service (SaaS) Provides remote access to software hosted in the Cloud.

software license A legal agreement that specifies how you can install and use software.

software piracy Unlawful reproduction and/or distribution of any copyrighted digital files including videos, music, e-books, and software.

software registration An optional process of identifying yourself to the software manufacturer as the person who purchased a copy of the software.

software suite Related applications that are bundled together in a single software package.

software utility A utility program for managing or maintaining software, including software updating tools, virus and other malware scanners, and system monitors.

solid-state drive (SSD) A type of hard drive that uses flash memory technology to store data as electrical rather than magnetic charges.

spam Unsolicited e-mail; in many instances, used to advertise products and services.

sparkline A tiny chart embedded in a cell that provides a visual representation of data.

spelling checker A feature of a word-processing application that compares the spelling of one or more words to the words in its electronic dictionary, flags the ones that might be misspelled, and offers possible corrections.

spider Also called a Webcrawler; automated software that uses an algorithm to search Web sites for relevant information.

split To divide a worksheet into two panes.

splitting cells Converting a cell into multiple cells by adding cell boundaries.

spreadsheet An arrangement of text and numbers in a rectangular grid or table of rows and columns.

spyware Software that monitors your computing actions, usually while you are online, to collect information about you.

spyware definition A file containing the characteristics of known spyware.

Standard account A user account designed for everyday computing.

Start screen The screen where you start working on a Windows 8 computer.

statistical function A function that describes large quantities of data.

stemming When you search for a keyword, the search engine also searches for the root forms of that keyword and returns results that include additional variations of the keyword.

storage device Hardware that records and retrieves data from storage media.

storage media The physical materials used to store data, such as disks and DVDs.

streaming A technique for transferring data in a steady and continuous stream so you can start displaying the data before the full transmission is completed.

style A set of formatting characteristics that you can apply to characters, paragraphs, tables, and numbered and bulleted lists.

stylus A pen-like writing instrument that works with touchscreens.

subdomain A domain that is part of a larger domain and is dependent on the larger domain.

subfolder A folder within another folder.

supercomputer A very powerful computer distinguished by its processing capacity, especially its speed of calculation. To be classified as a supercomputer, a computer must be one of the fastest computers in the world.

swap To move data out of RAM and into virtual memory.

switch A network device that performs the same tasks as a hub, but it works much faster; instead of sending the frame of data to all connected devices, a switch filters the target for the frame and forwards the frame only to a specific device in the LAN.

synchronize To compare files on two drives and update files as necessary so the drives contain the same versions of the files.

system file A file necessary for running the operating system.

system recovery disk Removable media such as a DVD that contains system recovery tools to help restore a computer if a serious system error occurs.

system requirements Hardware specifications necessary for running software.

System Restore A system utility that helps you restore system files to an earlier state, usually one during which the startup problem did not occur.

system software The software that runs a computer, including the operating system and utility programs.

system time The time the computer uses, which is displayed in the notification area of the taskbar.

T

T-1 line A type of fiber-optic telephone line that can transmit voice and data at the same time.

table style A set of predefined formats that you can apply to all the worksheet data.

tablet A one-piece mobile computer that typically includes a touchscreen.

tag A keyword you associate with a file.

telecommuting Using communications technology to keep the employee connected to the office.

template A file that affects the basic structure of a document and contains document settings such as fonts, line spacing, margins, and page layout.

text box A drawing object that enables you to add text to artwork.

text messaging Often referred to as texting or Instant messaging (IM), a text-based form of communication primarily used for conversational text.

theme A desktop background and a coordinated set of colors, sounds, and other elements.

thrashing A condition where the operating system spends more time swapping data between RAM and virtual memory than running software.

thread A group of related messages in an online forum.

time bomb A virus that does not cause damage until a specified date or until the system has been launched a certain number of times.

time-shifting mode When you send messages by e-mail, post information on a bulletin board, or publish a blog, there can be a significant delay between the transmission and the receipt of the information.

toggle To alternate between the off and on states by repeating a procedure, such as clicking a button.

Touch Mode In Microsoft Word and other Office applications, an application mode that adapts the Ribbon for users of touchscreens.

touchpad A touch-sensitive surface that can convert the motion and position of your fingers to a relative position on screen; also called a trackpad.

touchscreen A screen you touch to interact with software.

tower A case containing the system unit that stands vertically on the floor.

trackball A pointing device that works like a mouse with a ball on top of the device. You use your thumb and fingers to manipulate the ball, which controls the pointer on the screen.

trademark The exclusive right to visual or commercial images.

Transport Layer Security (TLS) Technology that encrypts sensitive information and authenticates servers and clients to ensure a secure connection.

trigger An instruction that will start a sound effect or animation segment on a PowerPoint slide.

Trojan horse Malware that hides inside another program, and infects a computer when the program is installed.

troubleshooting To take a logical, systematic approach to identify the source or cause of the problem, and then apply a solution so that the computer is working normally again.

two-step verification A security method that requires more information than a password to authenticate your identity.

U

ultrabook *See* netbook computer.

Uniform Resource Locator (URL) Often referred to as a Web address; identifies the unique IP address of a computer or server.

uninstaller A tool similar to a setup program that completely removes software from your computer.

uninterruptible power supply (UPS) A device that contains a battery to provide power if the normal current is interrupted.

Universal Serial Bus (USB) A common type of bus that you can use to connect 127 different devices to a single USB port.

Universal Serial Bus (USB) adapter Hardware that portable computers use to connect peripheral devices to slots or ports that you can access outside of the system unit.

update A collection of files (larger than a patch) that revise software to fix problems or provide enhancements.

upgrade A new version of software in which the developers make major improvements, add new features, or change the software design.

USB drive A removable disk that you plug into a USB port on your computer.

USB hub A device that contains a number of USB ports, and plugs into a single USB port on a computer.

user agent A software application such as e-mail, text message, or an instant messaging program.

user credentials A username and a password. *See also* credentials.

user interface The part of a computer system that allows you to enter and receive information.

username A unique name that identifies you to a computer system.

utility program A program that helps the operating system setup, maintain, and protect a computer.

V

value The text and numbers contained in a worksheet cell.

video chat An online conversation during which you see the person with whom you are talking.

video conferencing Using computer networks to transmit audio and video data.

video input Still or moving images captured electronically.

virtual memory The part of a computer's storage space that can serve as additional RAM.

Virtual Private Network (VPN) A network service that enables remote users to use a public network (usually the Internet) to access their private networks (usually a home or office network).

virus A file that copies itself and triggers computer code to infect your computer.

virus definition A file containing the characteristics of known viruses.

VoIP (Voice over Internet Protocol) Technology that enables the delivery of voice communications and multimedia sessions using Internet Protocol.

W

Web application (Web app) An application stored on a server that you access using a browser.

Web browser A software program you use to view and retrieve documents from the Web and to display the documents in a readable format.

Web conferencing Also referred to as a Webinar; a presentation, lecture, workshop or seminar that is transmitted over the Web.

Web directory Also referred to as a search directory; a collection of Web sites organized by category, and then often further organized by geographic region.

Web server A server that handles the exchange of information across the Internet.

Web site A Web page or a collection of related Web pages located on the Web.

Webcrawler Also called a spider; automated software that uses an algorithm to search Web sites for relevant information.

what-if analysis A way to explore how changing numbers and other values such as dates affects calculated results.

Wi-Fi Uses radio waves to provide wireless high-speed Internet and network connections.

wide area network (WAN) A network that contains a substantial number of computers and covers a large geographical area (a state, country, or even the world).

wiki A collaborative Web site that people can use to add, edit, remove, and organize Web page content.

wildcard character A keyboard character used to represent one or more characters in a search.

window A rectangular work area that contains tools for performing work and interacting with a program.

Windows 8 The most recent version of the Windows operating system.

Windows Phone The Windows operating system designed for smartphones.

Windows RT The Windows operating system designed for tablet computers.

Windows Update A Control Panel tool you use to check for the latest updates to Windows and to review your update settings.

wireless local area network (WLAN) A variation of the LAN that connects devices with a wireless connection.

word wrap A feature that keeps text within the document margins. When the text you are typing fills a line, the feature automatically moves the text you type to the next line without requiring you to press the Enter key.

WordArt graphics A feature that enables you to transform text into a graphic.

workbook Where worksheets are stored; a workbook contains one or more worksheets.

worksheet Also called a sheet; in Microsoft Excel, a grid of columns and rows formatted to contain text, numbers, and formulas.

worksheet tab A tab in the horizontal scroll bar to provide quick and easy access to a worksheet.

World Wide Web Often referred to as the Web and abbreviated as WWW or W3; a global collection of interconnected documents (Web pages) and other resources.

worm Harmful computer code that spreads without your interaction.

X

XML Paper Specification (XPS) A format developed by Microsoft designed to preserve the visual appearance and layout of each page and to enable fast viewing and printing.

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