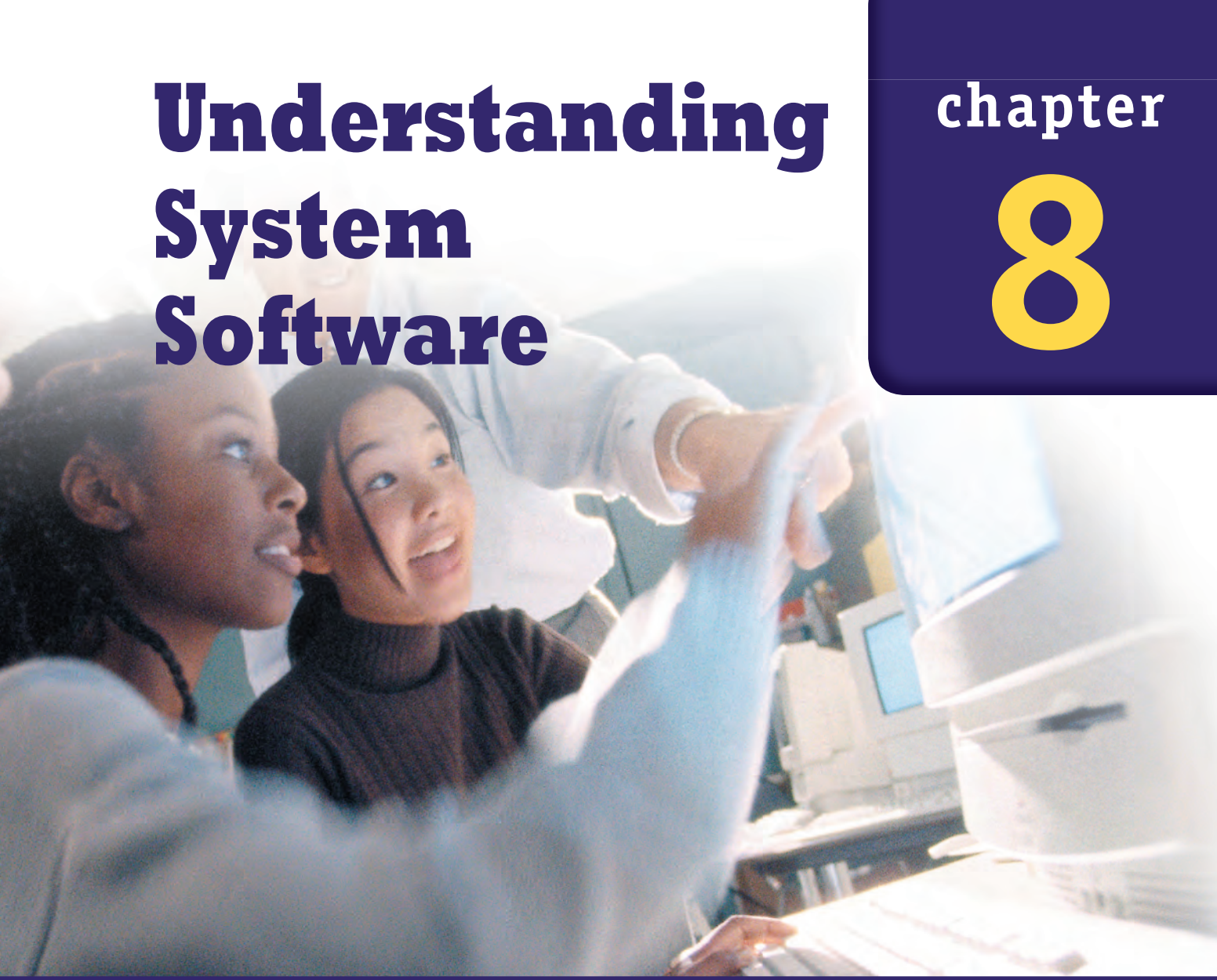


# Understanding System Software

chapter

8



**What Is the Purpose of an Operating System?** When you use a computer program, most of the activity you see on the screen is conducted by the operating system. An application, such as a word processor, asks the operating system to perform actions, such as opening a file, printing a document, or showing a list of recently used documents.

To fulfill these requests, the operating system needs to know how to handle different **file formats**, or standards used to save data on a disk. Those formats determine how text documents, graphics, audio, and video files are stored and used. In this chapter, you will learn more about what the functions that the operating system and its utilities perform, and how you use them.

## Chapter Outline



### Lesson 8-1

**Exploring the Operating System**



### Lesson 8-2

**Exploring System Utilities**

**Objectives**

- Summarize the boot process.
- Describe the features of a graphical user interface.
- Explain how operating systems can be configured and changed.

**As You Read**

**Organize Information** Use a concept web to help you collect information about operating systems as you read.

 **Key Terms**

- boot
- hibernate mode
- pop-up menu
- power-on self test (POST)
- pull-down menu
- Ribbon
- screen saver
- sleep mode
- system administrator
- user account
- user rights
- window

**Loading the Operating System**

The operating system, or OS, controls the computer and manages its work. The OS also provides an interface which enables you to interact with the computer.

**The Boot Process** When you turn the computer on, you **boot** it. That is, you start the computer, and it responds by loading the operating system. If your computer is set to show it, the first thing you see is the BIOS screen. As you learned in Chapter 5, *BIOS* stands for basic input/output system, and it manages and configures the computer's hardware. This means that the computer will be able to accept input from the keyboard and display information.

**The Power-On Self Test** As a computer boots, it performs a series of tests called the **power-on self test**, or **POST**. During POST, the BIOS checks the major components of the system, such as its memory, keyboard, and hard drive.

If your BIOS screen is set to display during POST, you will see text messages telling you what is happening. If there is a problem, a written message or a sound alerts you. If this happens, the computer may need repair. If no problem is detected, parts of the operating system are loaded from storage into memory and take control of the computer.

**The Login** As the operating system starts, you may see a screen that asks you for a username and password. This is called the login screen. Businesses and schools often use this process to control who has access to the computer.

**Exploring the GUI**

When the operating system is loaded into RAM, it displays the desktop provided by the graphical user interface, or GUI. The desktop is where all work is done, including opening and closing programs, modifying system settings, and managing files. Icons on the desktop allow you to launch programs by click-

ing or double-clicking them. You also can click Start (on a PC) or Finder (on a Macintosh®) and then the name of the program you want. A taskbar on the desktop identifies which programs or files are open. To switch back and forth among applications, just click what you want to work on next.

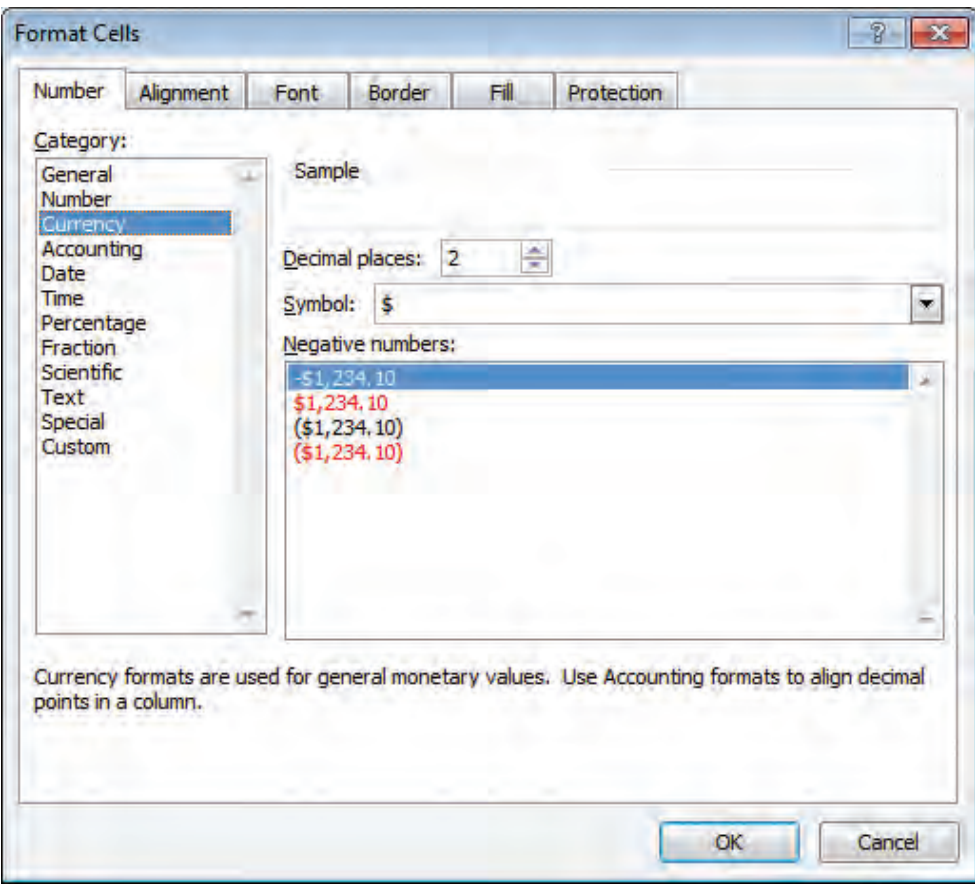
**Using Windows** The operating system in today’s PCs and Macintosh computers displays documents in **windows**, or rectangular, on-screen frames that can be opened, closed, resized, and rearranged to view programs or documents. Each window provides commands and options. Some programs have **pull-down menus** that list commands when you select an item from the menu. Sometimes menus have submenus with additional commands. In Microsoft Office 2010, the window provides commands on the **Ribbon**, a series of tabs at the top of the window. Each tab has a group of related commands for specific tasks. A command may display a dialog box that lets you set several options at the same time.

**Pop-up menus**, or lists of shortcut commands that appear when an area of the screen is clicked or right-clicked or the mouse button is held down, can appear anywhere in a window. Pop-up menus can be context-sensitive, providing options that relate to tasks you are doing at that moment.

## Did You Know ?

Today, a number of operating systems use voice recognition, which allows you to say, for example, “Computer, start word processing,” or “Computer, check e-mail,” and the computer will know what you mean. However, you must know the right commands. If you say, “Ditch that file,” instead of “Delete that file,” the computer will not know how to process the command.

**Figure 8.1.1** Many programs have dialog boxes you use to select options, such as number formats in a spreadsheet.



## Connections

**The Arts** A screen saver is a utility designed to protect the monitor by continuously changing the image it displays. Most screen savers use an animated effect, such as flying graphics or product logos, or imaginative shapes that build themselves piece by piece on the screen.

Screen savers are created by talented artists, using sophisticated digital drawing and animation tools. These artists need to know more than just how to draw; they need to know how to create effective, small-scale animations that will work under a specific operating system.

## Exploring Configuration Options

Computer systems come in many different configurations. In order for an operating system to work correctly on every computer it must be flexible. The two most common tools an operating system uses to adapt to different requirements are drivers and system preferences.

- Drivers let the OS work with different devices and peripherals. Some basic drivers for common devices such as a keyboard and a mouse are built into the operating system. Other drivers you install when you connect a device.
- System preferences let the user select options for controlling and customizing options, such as the appearance of the user interface or how the computer will shut down. In Windows, you use the Control Panel to access the customization options. On a Mac, you use the System Preferences command.

**Power Options** You can usually set options to control the way a computer uses power. This is particularly important when you use a system such as a tablet or notebook that relies on a battery. Using more power might increase performance, but it also drains the battery faster and costs more on your energy bill. Some operating systems, such as Windows, have built-in power plans designed for maximum performance, maximum energy conservation, or a balance.

## Real-World Tech

### Offering a Free Operating System

As discussed in Chapter 7, the operating system Linux® is based on a powerful scientific system called UNIX®. Linux is freeware, or open-source software, which means programmers can freely modify its code. To help expand computer use in schools in Mexico, Miguel de Icaza, while still in his 20s, developed GNOME, one of the Windows-based, easy-to-use desktop graphical user interfaces for Linux.

What are some of the advantages and disadvantages of a freeware operating system?



**Power States** You know your computer can be on or off. It can also be sleeping or hibernating. In **sleep mode**, which may be called standby, power is shut off to non-essential components. Some power is used and data remains in RAM. In **hibernate mode**, data from RAM is saved to the hard disk and then power is shut down.

Most operating systems let you select options for entering sleep mode or powering down the display after a set period of inactivity. On a tablet or notebook, you might also be able to change the function of the Power button. Options include doing nothing, powering down, sleeping, or hibernating.

Changing system settings lets you customize your computer, but it can also cause your computer to malfunction. Most operating systems have a feature that lets you restore settings to a previous configuration.

**Desktop Changes** Your operating system lets you change the desktop display. Among your choices are these:

- change the background appearance of the desktop, sometimes called the wallpaper
- change the **screen saver**, a utility program that changes the screen display after a preset period of nonuse
- add or eliminate desktop icons for various programs
- display or hide the taskbar

## Real-World Tech

**See It on the Big Screen** One fascinating task that computers do is create some of those dramatic special effects you see in movies. The Linux operating system, authored by Linus Torvalds (pictured at right), has been especially influential in this area in recent years. Linux was used in the filming of *Titanic* to make a model of the ship look real; in *The Fellowship of the Ring* to make human actors look small and a computer-generated troll look huge; and in *Shrek* to combine models and animation with startlingly lifelike effects.

What movie have you seen recently in which the special effects caught your attention?



## Connections

**Social Studies** Adding new hardware to a classroom computer can create exciting possibilities. Think of a user account for a social studies teacher on a school district's network. If the hardware rights for the account allow the user to add hardware, the teacher might connect a large-screen monitor so a current event article downloaded from a history Web site could be displayed for the entire class to read at once. A map downloaded from the Internet could also be displayed on the monitor.

With installation rights, Webcams, and a microphone, students could interview a political figure or complete a project with students in another city.

## Managing User Accounts

Since computers are used for many different tasks, from playing games to writing reports and calculating numbers, businesses may want to restrict the use of some programs and files to designated users. This may also be true in schools, homes, and other settings where several people can use the same computer.

**Username and Passwords** One way to protect data is to set up **user accounts** that identify who can access a computer. Each user is assigned a username and a password that he or she must provide in order to gain access. User accounts are set up using a system tool provided by the operating system. The **system administrator** is the person responsible for maintaining the computer system and for setting up user accounts.

**User Rights** User accounts may also have specific **user rights** assigned to them to limit or allow access, including:

- file access rights that specify which files a user can access and what he or she can do with these files
- installation rights that specify whether a user can install or remove programs
- hardware rights that specify whether a user can add or remove hardware
- configuration rights that specify whether a user can change operating system settings

# Exploring System Utilities

## Objectives

- Analyze file names and file formats.
- Explain cross-platform compatibility issues.
- Identify and discuss system maintenance utilities.

## As You Read

**Draw Conclusions** Use a chart to help you draw conclusions about system utilities as you read.

## Managing Files and Folders

Among the most important system utilities is the file manager, called Explorer in Windows and Finder in Mac OS. This utility allows you to organize, view, copy, move, rename, and delete files. You can even use it to create certain types of files.

**Directories and Folders** Most operating systems manage file storage using a multilevel, or **hierarchical**, filing system called a **directory**. The directory looks like the roots of a tree. At the top is the main storage location, called the **root directory**. Within the root are **subdirectories** called folders, which may contain other folders, called subfolders, and files. Most operating systems come with some folders already set up. For example, Windows comes with Documents, Pictures, Control Panel, and so on. You can create new folders and subfolders as needed.

**Naming Files and Folders** When you create a new file or folder, you give it a **file name**. Using descriptive names helps you identify the contents and keep your data organized. For example, the name *2013 Annual Report* is more descriptive than *Report*. It also helps keep you from accidentally deleting or overwriting files and folders that have the same name. Most operating systems let you use file and folder names with up to 255 characters, including spaces and punctuation. You cannot use <, >, /, :, ", /, \, |, ?, or \*.



## Key Terms

- corrupted
- cross-platform compatibility
- directory
- disk scanner
- file extension
- file format
- file fragmentation
- file name
- hierarchical
- root directory
- subdirectories

**File Extension** Some operating systems, such as Windows, automatically add a period and a file extension to file names. A **file extension** is a short series of letters that indicate the application used to create the file and the **file format**. For example, a Microsoft Word document has the extension .doc or .docx. You can set options to display file extensions when you view a file list. By default, the operating system uses the program associated with the file extension to open the file. So, a file with an .xlsx extension opens in Microsoft Excel and a file with a .wmv extension opens in Windows Media Player.

**Figure 8.2.1** You can display file extensions when viewing files with Windows 7.

Name	Type	Size
Current Science Projects	File folder	
Article.docx	Word 2007 Document	18 KB
Astronomy Presentation.pptx	Microsoft Office PowerPoint 2007 Presentation	3,793 KB
Book Report Presentation.ppt	Microsoft PowerPoint 97-2003 Presentation	6,857 KB
Drawing.gif	GIF image	222 KB
Invitation Back.pub	Microsoft Publisher Document	113 KB
Invitation Front.pub	Microsoft Publisher Document	148 KB
Lion.jpg	JPEG image	200 KB
Mayans.docx	Word 2007 Document	27 KB
Scanned Image.tif	TIF File	1,970 KB
Schoolwork Compressed.zip	Compressed (zipped) Folder	10,571 KB



## Spotlight on...

### STEVE JOBS

“I know if I got run over by a bus tomorrow, Apple’s going to keep on going—because the engines have been put in place and cultures have been put in place to keep innovating, to keep doing things at this level of quality.”

Steven Jobs  
Founder, Apple computers

At age 21, Steven Jobs and his friend Stephen Wozniak founded Apple Computer Company in the Jobs’ family garage. A year later, Apple

released the first mass-market personal computer. In 1984, Apple released the Macintosh computer, the first personal computer to use a GUI. Jobs, who passed away in 2011, was considered a visionary for anticipating the demand for devices such as the iPod music player, iPhone smart phone, and iPad tablet computer.





## Using Files on Different Operating Systems

The two most widely used operating systems are Microsoft Windows on PCs and Mac OS on Apple Macintosh computers. Many times, a file created on one OS can work on another. This is because the OS associates files with specific programs.

**Cross-Platform Compatibility** Sharing files across operating systems is called **cross-platform compatibility**. There are two keys to compatibility. First, both operating systems must have the same program installed in a compatible version that has been written for each operating system. Second, the application must allow its file formats to be shared across different operating systems.

## Using System Maintenance Utilities

Like any machine, a computer needs routine maintenance. System maintenance utilities do these jobs and more.

**Disk Management** Computer files can be **corrupted**, or damaged to the point at which data is unrecoverable, in different ways. One way is by being stored on a damaged part of the hard drive. Running a utility called a **disk scanner**, which checks magnetic disks for errors, can fix this problem. A disk scanner looks for and tries to correct irregularities on a disk's surface. You can use a disk cleaner utility to identify files such as cookies, offline Web pages, and temporary files that you can delete to make more disk space available.

**Disk Defragmenter** As you add, move, and delete files on your computer, parts of files end up saved in different areas of the hard drive. **File fragmentation** occurs when a file is broken into pieces that are saved in different places on a hard drive.

File fragmentation reduces disk efficiency because the read/write head must travel longer distances to retrieve parts of a file that are scattered across a disk than if the files were stored close together. A disk defragmentation program can gather all the file pieces and place them together, thus improving the efficiency of the disk or hard drive.



**Emulation Developers** To strengthen their appeal to users, operating system and application developers often create emulation hardware or software that allows an operating system designed for one hardware platform to work on another. To work as a developer in this field, candidates must have strong experience in hardware and software engineering.



A digital picture frame is a simple computer with a CPU, memory, and an operating system. It has an LCD screen that displays a slide show of photographs sent via the Internet.

### Think About It!

Which system utilities listed below might you want to run when sending digital photos via the Internet?

- ▶ file manager
- ▶ disk scanner
- ▶ disk defragmenter
- ▶ antivirus software

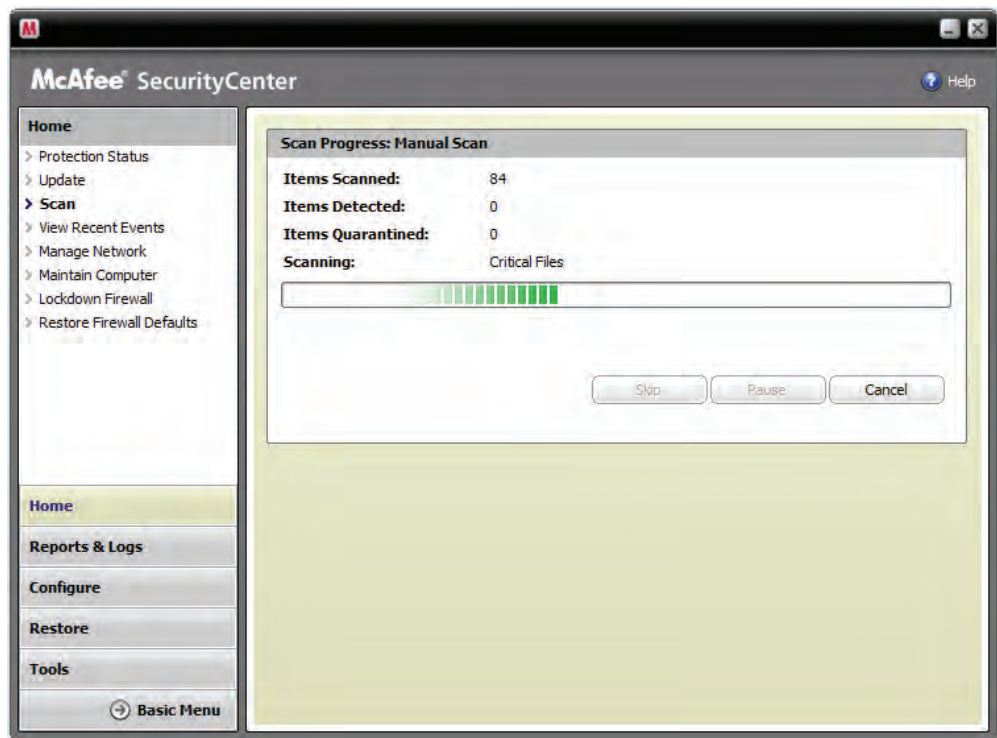
**Virus Detection** Viruses and malware can enter your system through infected e-mail messages, programs, and files. Antivirus and antimalware utilities constantly monitor your system for viruses and malware programs that can slow down processing or damage your data and devices. Once there, they can destroy or corrupt data.

Antivirus programs check your computer's memory and disks looking for virus code. Most programs can also check e-mail and files as they are downloaded to your computer from the Internet. If the program finds a virus, it alerts you and then attempts to disable and remove the virus.

Because new viruses and malware are introduced every day, it is important to install antivirus and antimalware program updates automatically whenever they become available.

**Figure 8.2.2**

Scanning a disk for viruses with the McAfee® Security Center.



## Use the Vocabulary

**Directions:** Match each vocabulary term in the left column with the correct definition in the right column.

- |                                       |  |
|---------------------------------------|--|
| _____ 1. boot                         | a. to start the computer and load the operating system                     |
| _____ 2. POST                         | b. option that appears when an item is selected from the menu bar          |
| _____ 3. window                       | c. utility that looks for errors in magnetic media                         |
| _____ 4. pull-down menu               | d. changes the display on the desktop                                      |
| _____ 5. pop-up menu                  | e. two or three letters that identify a file's format                      |
| _____ 6. screen saver                 | f. series of tests run during the boot process                             |
| _____ 7. file extension               | g. ability to share files across operating systems                         |
| _____ 8. cross-platform compatibility | h. shortcut command that appears anywhere in a window                      |
| _____ 9. disk scanner                 | i. frame that displays a document or file                                  |
| _____ 10. file fragmentation          | j. having parts of files stored on different areas of a disk or hard drive |

## Check Your Comprehension

**Directions:** Determine the correct choice for each of the following.

- Which of the following indicates that the computer can accept input from the keyboard and display information on the monitor?
  - POST
  - BIOS screen
  - GUI
  - cross-platform application
- At what point in the boot process can users be asked their username and password?
  - at the control panel
  - in a screen saver
  - in a file manager
  - at login
- If a pop-up menu is context-sensitive, what is it related to?
  - file format
  - printer settings
  - what you are doing
  - operating system
- Which of the following is NOT a system change most users should attempt?
  - moving the operating system
  - adding a scanner
  - changing mouse settings
  - removing a program
- Along with the data itself, which of the following is saved with a file?
  - login procedure
  - code for the application that created it
  - icon that describes it
  - maintenance utility
- Which of the following is one way that a file can be corrupted?
  - by deleting it
  - by appearing on the desktop
  - by moving it to a new folder
  - by storing it on a damaged disk

 **Think Critically**

**Directions:** Answer the following questions.

1. What feature would you like to see in the next generation of graphical user interfaces? Why?
2. After you add a peripheral to your computer or change a preference, you are asked to reboot the computer. Why do you think this is necessary?
3. Why do most operating systems let users make system changes?
4. Suppose some of the reporters and photographers for your local newspaper work from home and are networked. What is an example of one application that would allow them to work without concern for the operating system they use?
5. Which system maintenance utility do you think requires the most user interaction? Why?

 **Extend Your Knowledge**

**Directions:** Choose and complete one of the following projects.

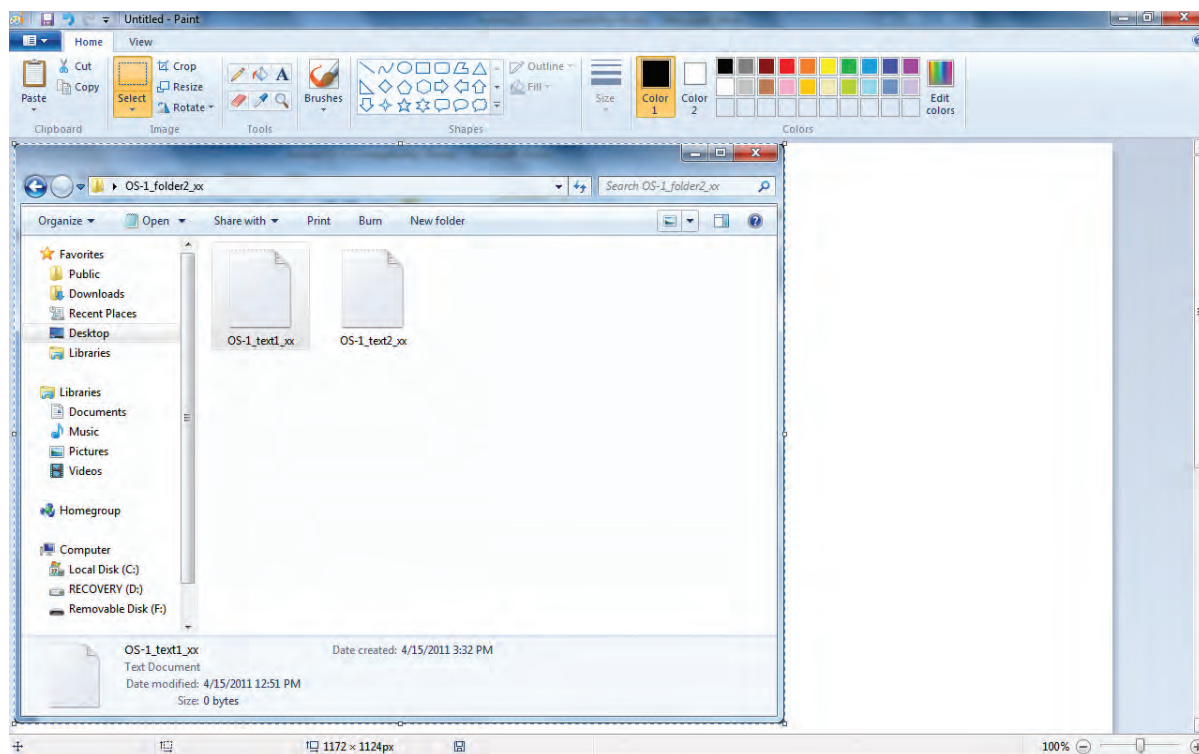
- A.** With a partner, interview three adult computer users: one who uses Microsoft Windows, one who uses a Macintosh, and one who has experience with both operating systems. Prepare written questions related to ease of learning the operating system, ease of use, availability of programs, and overall satisfaction with the operating system, and take notes to record the answers. Add your findings to your own experiences and write a conclusion about the user preferences of the two major operating systems. Share your conclusion with a partner or with your class.
- B.** Explore the desktop on your computer. Identify the icons on the desktop and explain what each launches. Use the taskbar to identify files or programs that are open and the file formats they are in. How does the desktop help you manage your work on the computer? Using a text editor, word-processing application, or on paper, write a paragraph explaining the concept of a computer desktop. Then, write step-by-step instructions that someone could use to arrange items on the desktop. With your teacher's permission, print or publish the document and exchange it with a classmate. Read your classmate's work. As a class, discuss why step-by-step instructions are useful.

## Activity 1: Managing Files and Folders

**DIRECTIONS:** You will use your operating system to navigate to a storage location where you will create a folder. You will then create, copy, move, rename, and delete files and subfolders. You will also display file properties and change the folder view. Windows 7 procedures required for this activity can be found in Appendix A.

1. Start your computer, and log in to your user account, if necessary.
2. Use your operating system to navigate to the location where your teacher instructs you to store the files for this activity. For example, plug a flash drive in to a USB port, and display the contents of that drive in a program window.
3. In the storage location, create a new folder named **OS-1\_folder1\_xx**. Replace **xx** with your own initials or name, as directed by your teacher.
4. In the same storage location, create a new text document named **OS-1\_text1\_xx**.
5. Copy **OS-1\_text1\_xx** in to **OS-1\_folder1\_xx**.
6. In **OS-1\_folder1\_xx**, rename **OS-1\_text1\_xx** to **OS-1\_text2\_xx**.
7. Navigate back to the original storage location.
8. Rename **OS-1\_folder1\_xx** to **OS-1\_folder2\_xx**.
9. Move **OS-1\_text1\_xx** in to **OS-1\_folder2\_xx**.
10. Open **OS-1\_folder2\_xx** and, if not already selected, change the folder view to Large Icons.
11. On your keyboard, press **[ALT] + [PRTSC]** to capture an image of the folder window.
12. Start a graphics or paint program, such as Paint, and paste the screen capture image in the program window. It should look similar to Illustration A.
13. Save the file as **OS-1\_image1\_xx** in **OS-1\_folder2\_xx**.
14. With your teacher's permission, print the file, and then exit the program.
15. In **OS-1\_folder2\_xx**, change the folder view to Content.
16. Change the folder view to Details.
17. Display the properties for **OS-1\_image1\_xx**, and then close the Properties dialog box.
18. Delete **OS-1\_text2\_xx**.
19. In **OS-1\_folder2\_xx**, create a new folder named **OS-1\_folder3\_xx**.
20. Copy **OS-1\_text1\_xx** into **OS-1\_folder3\_xx**.
21. Delete **OS-1\_folder3\_xx**.
22. Navigate to the original storage location, and close it.
23. If necessary, safely remove or eject the storage device.
24. With your teacher's permission, log off and/or shut down the computer.

Illustration A

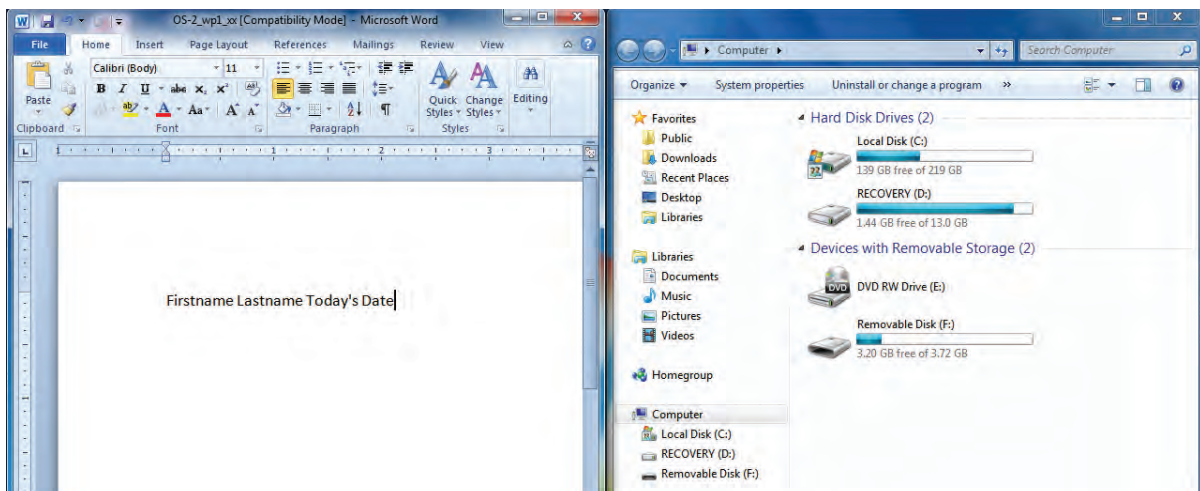


## Activity 2: Exploring the Operating System

**DIRECTIONS:** You will explore the features of your operating system. You will identify storage devices, network components, and installed printers, and you will locate information about the amount of installed RAM and processor speed for your system. You may complete this activity alone, or work as a team. Windows 7 procedures required for this activity can be found in Appendix A.

1. Start your computer, and log in to your user account, if necessary.
2. Create a new text file named **OS-2\_wp1\_xx** in the location where your teacher tells you to store the files for this activity.
3. Start a text editor or word-processing program, and open **OS-2\_wp1\_xx**.
4. Maximize the program window, if it is not already maximized.
5. Type your name and today's date in the file, and save the changes.
6. Minimize the program window.
7. Use your operating system to display available storage devices.
  - ✓ In Windows, click Start, and then click Computer.
8. Count the number of available storage devices.
9. Make the text editor or word-processing program window active.
10. Arrange the two open windows side by side. Your desktop should look similar to Illustration B.
11. Cascade the two open windows.
12. Maximize the text editor or word-processing program window.
13. In the text file, press Enter to start a new line, type **Storage devices:**, and then type the total number of available devices you counted in step 8. Save the changes.
14. Restore down the program window.
15. Make the Computer window active.
16. Display the contents of a storage device. For example, double-click Local Disk (C:) or a removable device.
17. Display the components of your current network.
  - ✓ In the Windows Navigation pane, click Network, or click Start and then click Network.
18. Close all Explorer windows, leaving the word-processing program open.
19. Display a list of available printers.
  - ✓ In Windows 7, click Start > Devices and Printers.
20. Count the number of available printers.
21. Make the text file active, press Enter, type **Printers:**, and then type the total number of available printers you counted in step 20. Save the changes.
22. Display system information, including the amount of installed RAM and processor speed.
  - ✓ In Windows 7, Click Start > Control Panel > System and Security > View amount of RAM and processor speed.
23. Switch to the text document, press Enter, type **RAM:**, and type the amount of installed RAM.
24. Press Enter, type **Processor speed:**, and type the processor speed. Save the changes.
25. Close all Control Panel windows.
26. With your teacher's permission, print **OS-2\_wp1\_xx**, then close it and exit the program.
27. Close all open windows. With your teacher's permission, log off and/or shut down the computer.

Illustration B



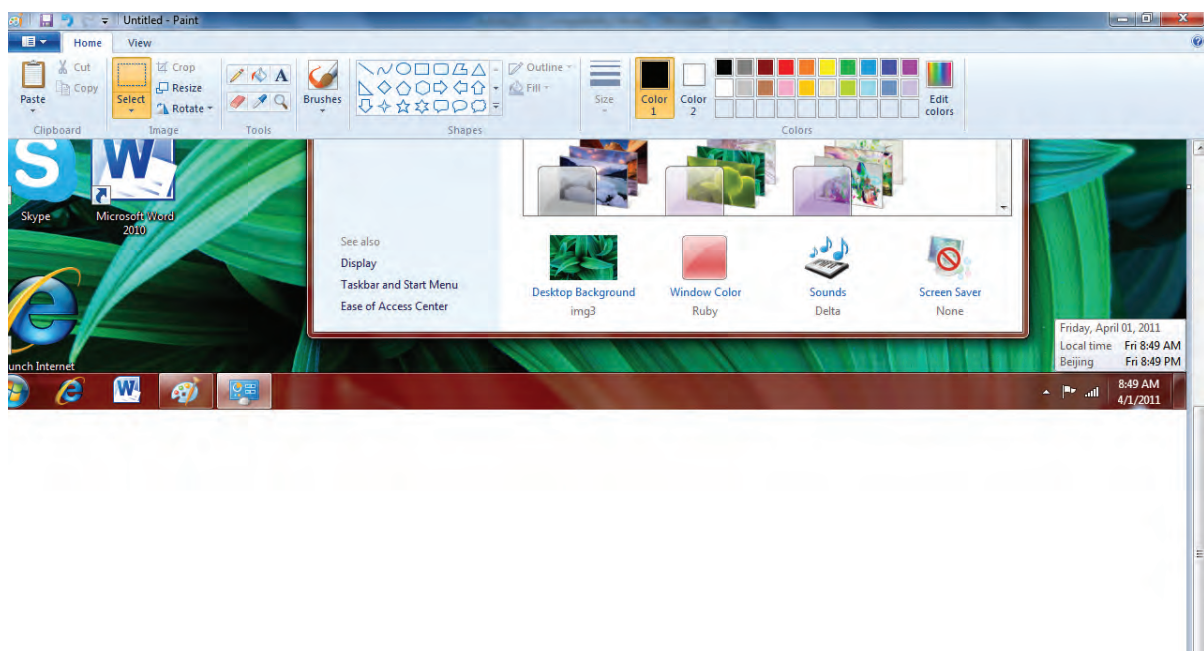


## Activity 3: Customizing the Operating Environment

**DIRECTIONS:** You will personalize your operating environment by customizing desktop icons and by changing the theme, desktop background, and window colors. You will capture an image of the desktop and paste it into a graphics file. Finally, you will reset all options to the previous configuration. Windows 7 procedures required for this activity can be found in Appendix A.

1. Start your computer, and log in to your user account, if necessary.
2. If necessary, change the desktop display to show large icons.
3. Sort the icons on the desktop by name.
4. Sort the icons on the desktop by type.
5. Personalize the desktop using a built-in theme. For example, if you are using Windows 7, apply the United States theme.
6. Personalize the desktop by applying a different picture to the background. For example, if you are using Windows 7, apply one of the Nature pictures.
7. Personalize the desktop by changing the color of window borders. For example, if you are using Windows 7, change the color to Ruby.
8. Display options for changing the date and time display.
9. Synchronize the clock with Internet time.
10. Select to display an additional clock, showing the time in Beijing, China. Name the clock **Beijing**.
11. Make sure the Beijing clock is displayed. (In Windows 7, rest the mouse point over the clock/calendar in the taskbar to display a ScreenTip.) Then, capture an image of the desktop.
12. Start a paint or graphics program, such as Paint, and paste the captured image into the new blank file. Scroll the window so you can see the clock. It should look similar to Illustration C.
13. Save the file as **OS-3\_image1\_xx** in the location where your teacher tells you to store the files for this activity.
14. With your teacher's permission, print the file, and then close it and exit the program.
15. On the desktop, create a shortcut to the **OS-3\_image1\_xx** file, and then use the shortcut to open the file.
16. Resize the program window so it is about 4" high by 4" wide.  
✓ If the window is maximized, you must restore it before you can resize it.
17. Close the file, and exit the program.
18. Mute the speaker volume.
19. Restore the desktop settings, clock, and speaker volume to the way they were at the beginning of this activity.
20. With your teacher's permission, log off and/or shut down the computer.

Illustration C





## Activity 4: Creating an Electronic Portfolio

**DIRECTIONS:** You will use your operating system to set up an electronic portfolio. You will read about how to create a useful and effective portfolio, and then you will create a folder with subfolders where you can store items you select to include. You will convert printed items into digital files, and you will copy or move digital files into the portfolio. Windows 7 procedures required for this activity can be found in Appendix A.

1. Open the .pdf file **OS-4\_Portfolio**, which is located on the student CD. This file contains information about electronic portfolios.
2. Read the information to learn about electronic portfolios.
3. In your operating system, navigate to the location where you want to store the electronic portfolio.
4. Create a new folder, and name it **OS-4\_Portfolio\_xx**.
5. In the folder, create one subfolder named **Academic Achievement**, a second named **Personal Information**, and a third named **Career Information**.
6. Select an application that you can use to create a list of artifacts and other items you will include in your portfolio. This might be a word-processing program, a spreadsheet program, or a database program.
7. Use the application to create a new file. Save the file in the **Personal Information** subfolder, with the name **OS-4\_List of Artifacts\_xx**.
8. In the file, list the name and a description of each artifact and item you want to include in the portfolio. (Refer to the list in the **OS-4\_Portfolio.pdf** file.)
9. In the file, include whether each artifact already exists, or if it is something you will create in the future.
10. In the file, also include the name of the subfolder in which you will store the artifact. For example, you might store a resume and list of references in the **Career Information** folder and an example of a word-processing document you typed and formatted in the **Academic Achievement** folder.
11. Save the file. You can modify it and refer to it as you develop your portfolio.
12. Locate existing artifacts and items you have stored in digital format and copy or move them into the appropriate subfolder in your **OS-4\_Portfolio** folder.
13. Locate printed artifacts and items, and use appropriate technology, such as a scanner or digital camera, to convert them into digital files. Store them in the appropriate subfolder in your **OS-4\_Portfolio\_xx** folder.
14. Select an application, and use it to create new items to include, such as a contact information sheet, a personal academic plan, and guidelines for assessment. Store the items in the appropriate portfolio subfolders.
15. Select an application, and use it to create reflections for your artifacts. Store the reflections with the artifacts in the portfolio.
16. Select an application, and use it to create a table of contents for your portfolio. Format the items as hyperlinks that link to the digital artifacts and items.
17. Practice presenting the portfolio to your class.
18. Continue to review, update, and add new artifacts and items to your portfolio on a regular basis.

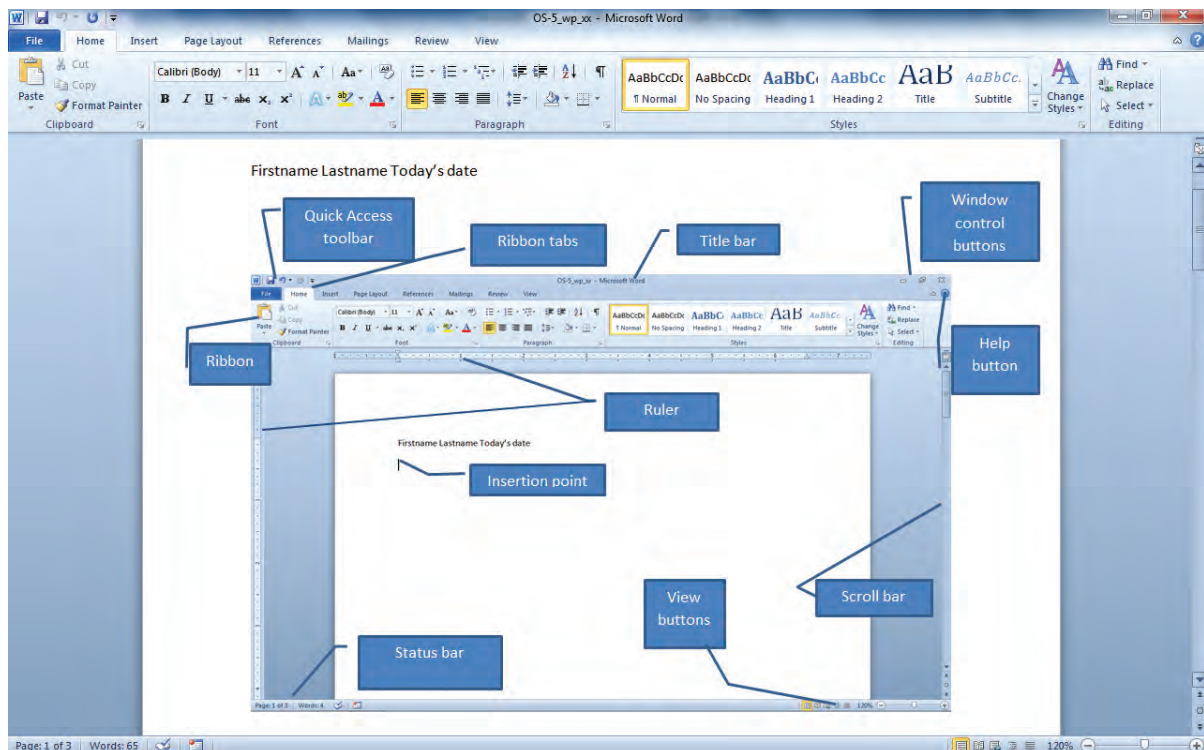


## Activity 5: Identifying Screen Elements

**DIRECTIONS:** You will use your operating system to capture images of different program windows and insert the images into a word-processing file. You will then print the file and label the elements on each image. Windows 7 procedures required for this activity can be found in Appendix A.

1. Start your computer, and log in to your user account, if necessary.
2. Start a word-processing application, such as Microsoft Word or Google Documents.
3. Save the default blank document with the name **OS-5\_wp\_xx** in the location where your teacher instructs you to store the files for this activity.
4. Maximize the application window.
5. On the first line of the word-processing file, type your first and last names and today's date.
6. Press Enter to start a new line.
7. Capture an image of the screen.
8. Paste the image from the Clipboard into the word-processing document.
9. Save the document, and then minimize the application window.
10. Capture an image of your computer desktop.
11. Restore the word-processing program window.
12. Press **CTRL** + **ENTER** to start a new page.
13. Paste the captured image into the word-processing document.
14. Save the document, and then minimize the application window.
15. Start a spreadsheet application.
16. Maximize the spreadsheet application window.
17. Capture an image of the spreadsheet application window.
18. Exit the spreadsheet application.
19. Make the word-processing application window active.
20. In the word-processing document, press **CTRL** + **ENTER**, to start a new page.
21. Paste the captured image into the word-processing document.
22. Save the word-processing document.
23. With your teacher's permission, print the word-processing document and label the parts of all three screens. Alternatively, use drawing tools to insert callouts or text boxes in the word-processing document to label the parts of the screens. Page 1, the word-processing screen, might look similar to Illustration D.
24. Close the word-processing document, saving all changes, and exit the application.

Illustration D



## Activity 6: Using a Help Program

**DIRECTIONS:** You will use a Help program to locate and review security settings. You will also access the command prompt and display a directory. Windows 7 procedures required for this activity can be found in Appendix A.

1. Start your computer, and log in to your user account, if necessary.
2. Start your operating system's Help program, and maximize the window.
3. Search for **managing security settings**.
4. Click a link for information about understanding security and safer computing.
5. Read the information, scrolling down in the window until you reach the end.
6. Click the Back button to return to the previous window.
7. Search for information about where you can view your security settings. For example, in Windows 7, search for **Action Center**.
8. Click a link for more information, such as the link *What is Action Center?*
9. Click a link to open the Action Center. If you are using an operating system other than Windows 7, click a link to open the window where you can view security settings.
10. If necessary, expand your security settings.
11. With your teacher's permission, use the links on the page to view your installed security programs, such as you firewall program and your antivirus program.
12. Close the security settings window.
13. Close the Help program window.
14. If you are on a Windows OS, open the Command Prompt. If you are on a Mac OS, skip to step 22.  
✓ Click *Start > All Programs > Accessories > Command Prompt*.
15. Type **dir**, and press **ENTER** to display a directory list of files.
16. Capture an image of the command prompt window.  
✓ Press **ALT** + **PRTS**.
17. Start a paint or graphics program and paste the screen capture into the file. It should look similar to Illustration E, although the actual directory contents depend on the contents of your system.
18. Save the file as **OS-6\_image1\_xx**.
19. Close the Command Prompt window.
20. With your teacher's permission, print **OS-6\_image1\_xx**.
21. Close the file, and exit the program.
22. With your teacher's permission, log off and/or shut down the computer.

Illustration E

