Understanding and Using

the Macintosh

SYSTEM 7

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Preface

If you lack computer knowledge and training—or have had limited and frustrating technological experiences—this book is for you. Understanding and Using the Macintosh is designed to provide a safe, productive, and enjoyable step-by-step guide to computer competency. Along the way, you will use two prevalent business application programs, Microsoft Word and Microsoft Excel, to explore how personal computers can increase your productivity when writing letters and reports, creating budgets and projections, and keeping track of information; and how they can make your work more attractive with graphics and charts.

How to Use This Book

Understanding and Using the Macintosh is designed for both traditional academic classroom settings and for self-paced instruction. Guided activities will engage you in hands-on learning activities that complement brief theoretical explanations. You will learn more from each unit, and find the guided activities easier to do, if you read through each computer concept and activity before attempting to perform the steps.

Overall Organization

The book is organized into three parts, with four to five units in each. Although each unit is, to some extent, a stand-alone tutorial, the units have been written with the expectation that they will be followed in sequence.

Part One, “Getting Started,” introduces you to the basics of Macintosh computing. Unit 1, “The Basics,” gives you just enough computing vocabulary to get started, shows you the steps to use the Macintosh® Basics on-screen tutorial, and explains how to take care of computer equipment properly and how to provide a safe and comfortable computing environment for yourself. Unit 2, “Preparation,” examines the computing process, and helps you to prepare two floppy disks: one disk to hold the files you will use with this book, and one disk to hold the work you will do on the Macintosh. Unit 3, “Text Manipulation,” takes you inside Microsoft Word to type, edit, save, and print some short passages—the first “work” that you will do on the Macintosh. Unit 4, “Desk Accessories,” guides you in using several small utility programs that enhance your computing environment. Unit 5, “Desktop Icons and Windows,” shows you how to identify Macintosh icons and to manipulate the Desktop windows that often hold these icons.

Part Two, “Word Processing and Graphics,” demonstrates ways in which Microsoft Word and other application programs may be used as sophisticated tools
to type, to manipulate, to decorate, and to change the presentation of written work. Unit 6, "Word Processing Basics," shows you many ways to alter text display and printing. Unit 7, "Page Design and Accuracy," teaches you to work with multiple-page documents, focusing on document accuracy, navigation, and the relationship between the screen document and its printout. Unit 8, "Paragraphs," shows you how to select individual and multiple paragraphs and change their appearance. Unit 9, "Graphics," teaches you to create computer pictures and incorporate them into word processing documents. Unit 10, "Expanding Your Word Processing Skills," shows you how your Microsoft Word knowledge can be generalized to other word processing programs, and how each of these packages may be used to produce professional and typographically correct textual and pictorial documents.

Part Three, "Data into Information," demonstrates some ways in which personal computers can help you to transform raw data into meaningful information. After following a Microsoft Excel on-screen tutorial and replicating its steps in Unit 11, "Spreadsheet Basics," you will learn to plan and to implement your own spreadsheet in Unit 12, "Spreadsheet Problem Solving." In Unit 13, "The Database," you will define part of a spreadsheet as a database to locate and organize specific information and to generate reports of that information. Unit 13 also demonstrates some of the features of the stand-alone database program, FileMaker Pro. Unit 14, "Macintosh Management," focuses on strategies for effective organization and utilization of both storage and memory. (Some instructors prefer to teach the skills in Unit 14 earlier than we do, and Unit 14 could be covered at the end of Part One. We have found, however, that students need more application practice, especially with opening and saving files, to achieve maximum benefit from this unit.)

Each unit contains the following features:

**LEARNING OBJECTIVES** the knowledge and skills addressed in the unit.

**COMPUTER SCREENS** figures depicting the steps and results of most commands.

**GUIDED ACTIVITIES** step-by-step, hands-on instructions for performing the operations discussed in the unit.

**COMMAND REVIEW** a list of the commands introduced in the unit, summarizing the execution and function of each.

**EXERCISES** additional computer work designed to challenge your knowledge of the materials presented in the unit. Some exercises have specific instructions, while others provide less guidance.

**REVIEW QUESTIONS** questions designed to test your understanding of the material presented. The answers to odd-numbered review questions are contained in Appendix A.

**KEY TERMS** a list of the important terms and concepts discussed in the unit. This list is designed for review and self-testing.
**Overall Expectation**

The student who reads each unit carefully and completes most of the guided activities and exercises should have a strong theoretical and practical understanding of personal computing on the Macintosh.

**A Note of Thanks**

- To the students of Santa Rosa Junior College and the Sonoma Valley Adult School who have been so vocal about what does and does not help them to understand and use the Macintosh.

- To the faculty of Santa Rosa Junior College and the Sonoma Valley Unified School District, who have provided enabling environments in which to share ideas and to teach computer science. To Robin Williams, role model and mentor: you have shown us what is possible, and we miss you! To Rick Phelan, you have provided the initial inspiration for several of the guided activities. To Cyndi Reese and to Metha Schuler, you have shared your ideas, your experience, and your materials freely. To Richard Abrahams, you never have enough time, but you always stop to locate what we need. To Lloyd Onyett and to Shirley Davis, you offer ongoing support and encouragement. To Karen Horii, for your tireless review of laboratory exercises, and your help with the instructors' manual. To Ann Taylor, who field-tested the Excel guided activities.

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- To the authors and reviewers of the other books in THE MICROCOMPUTER SERIES, whose efforts have laid a strong pedagogical foundation for this book.
Barbara Heiman adds these thanks:

- To Michael Heiman, the first and ultimate critic, for taking extra jobs, cooking many meals, washing many loads of laundry, sharing many ideas, and never losing sight of the final goal. To Tammy Heiman, for allowing your story to be told, and for finally learning to use a spreadsheet. To Joshua Heiman, writer; as we write together and critique each other’s work, I look forward to your first publication. To my parents, Paul and Mary Jane Zukin (AKA “Macintosh Grandma”), who educated me and have shared my enthusiasm for Macintosh computing. To my parents-in-law, Sylvia and Jerry Heiman, my models for the book’s intended audience. To the UC Berkeley Department of Anthropology, who encouraged me to define and study anthropology in its broadest sense—although none of us knew it would verge so far, or take so long.

Nancy McCauley adds thanks to:

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B.Z.H. & N.M.
Sonoma, California and Santa Rosa, California
January, 1994

For Michael:
who took us from Chaos into Cosmos
Publisher's Note

This book is part of THE MICROCOMPUTING SERIES. This popular series provides the most comprehensive list of books dealing with microcomputer applications software. We have expanded the number of software topics and provided a flexible set of instructional materials for all courses. This unique series includes five different types of books.

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3. A series of hands-on laboratory tutorials (*Understanding and Using*) are software specific and cover a wide range of individual packages. These tutorials, written at an introductory level, combine tutorials with complete reference guides. A complete list of series titles can be found on the following pages.

4. Several larger volumes combining DOS with three application software packages are available in different combinations. These texts are titled *Understanding and Using Application Software*. They condense components of the individual lab manuals and add conceptual coverage for courses that require both software tutorials and microcomputer concepts in a single volume.

5. A series of advanced-level, hands-on lab manuals provide students with a strong project/systems orientation. These include *Understanding and Using Lotus 1-2-3: Advanced Techniques Releases 2.2 and 2.3*, by Judith C. Simon.

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by Steven C. Ross

Understanding and Using Lotus 1-2-3 Release 2.2
by Steven C. Ross

Understanding and Using Lotus 1-2-3 Release 2.3 and Release 2.4
by Steven C. Ross

Understanding and Using Lotus 1-2-3 Release 3
by Steven C. Ross

Understanding and Using Lotus 1-2-3: Advanced Techniques Releases 2.2 and 2.3
by Judith C. Simon

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by Larry D. Smith
Understanding and Using Paradox 3.5  
by Larry D. Smith

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by Steven C. Ross

Understanding and Using dBASE IV Version 2.0  
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Understanding and Using Microsoft Works 3.0 on the PC  
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Understanding and Using Microsoft Works 3.0 on the Macintosh  
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by Gary Bitter

Understanding and Using Microsoft Works 2.0 on the Macintosh  
by Gary Bitter

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by Gary Bitter

**Combined Books**

*Essentials of Application Software, Volume 1: DOS, WordPerfect 5.0/5.1, Lotus 1-2-3 Release 2.2, dBASE III Plus*  
by Steven C. Ross, Jonathan P. Bacon, and Cody T. Copeland

*Understanding and Using Application Software, Volume 4: DOS, WordPerfect 5.0, Lotus 1-2-3 Release 2, dBASE IV*  
by Patsy H. Lund, Jonathan P. Bacon, and Steven C. Ross

*Understanding and Using Application Software, Volume 5: DOS, WordPerfect 5.0/5.1, Lotus 1-2-3 Release 2.2, dBASE III Plus*  
by Steven C. Ross, Jonathan P. Bacon, and Cody T. Copeland

**Advanced Books**

Understanding and Using Lotus 1-2-3: Advanced Techniques Releases 2.2 and 2.3  
by Judith C. Simon
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PART ONE launches you into the world of Macintosh computing by providing an overview of your computer system: the hardware, the software, and you.

Unit 1, "The Basics," gets you started. This unit leads you through the basic computing steps: turning on your system to use a guided tour called Macintosh Basics. After you turn off the computer, you will discover how a few simple tricks can enhance your computer safety, comfort, and health.

Unit 2, "Preparation," explains the basic elements of the computing process: processing, input, output, memory, and storage.

Unit 3, "Text Manipulation," demonstrates how to use Microsoft Word 5.1 software to input text, to save your work to disk, to modify the text using the mouse and the keyboard, to save your changes, and to print your work.

Unit 4, "Desk Accessories," shows you how to use the small utility programs that come with the Macintosh's System 7 software. You will set and use the Alarm Clock, write notes on the Note Pad, perform arithmetic on the Calculator, and play with the Puzzle.

Unit 5, "Desktop Icons and Windows," teaches you to identify Desktop icons and to manage your windows effectively.

By the end of Part One, you should understand the fundamentals of Macintosh computing, should use the mouse and keyboard comfortably, and should be able to locate and to use files stored on your hard disk and floppy disk.
Steven Jobs, co-founder of Apple Computer, Inc. and founder of NeXT, Inc., was asked what makes him so passionate about computers since they are just machines. He replied, “No, they are tools. Humans are tool builders. We build mathematics and language and agriculture. We build tools. And this is the most amazing tool we’ve ever created. It amplifies a lot of our inherent abilities, like memory and calculation. It’s starting to amplify our communication abilities, our visual abilities. I’m lucky enough to be in the right place at the right time to make a small contribution.” (San Francisco Examiner [San Francisco, May 9, 1993], ES.)

You, too, are lucky to be in the right place at the right time. You are going to use the Macintosh Computer to amplify your inherent abilities, and will have fun doing it.

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Learning Objectives

At the completion of this unit you should know

1. the definition of the term computer,
2. that a computer system has three integral parts: the hardware, the software, and the end user,
3. what happens when you start up your computer,
4. the purpose of the Macintosh Desktop,
5. why and how computing environments differ,
6. the function of the mouse,
7. the proper way to end a computing session,
8. how to take care of your hardware and software,
9. how to be a healthy computer user.

At the completion of this unit you should be able to
1. start up your system and reach the Desktop,
2. identify Desktop components: icons, windows, and pull-down menus,
3. use the mouse to select icons, to choose menu commands, and to manipulate windows,
4. perform basic mouse actions: point, click, press, drag, and double-click,
5. use the computer wisely.

---

**What is a Computer?**

A *computer* is an electronic machine that processes information. It follows human instruction to represent and manipulate text, graphics, symbols, numbers, and sounds.

People use computers to amplify human speed and accuracy. For example, a good typist can type about 60 words per minute (roughly 10 characters per second) with three errors; a personal computer can process 10 million characters per second with no errors. Because of their great speed, however, “a computer can make more errors in one second than a human could make in one lifetime!” as Doug McKenna noted.

People have many abilities that computers lack. We can figure out things from incomplete information, we can profit from experience, we can solve problems intuitively, and we can respond emotionally to a wide variety of situations. In spite of their complexity, all the computers in the world today do not have nearly as many neural circuits as one adult human brain. We have better technology.

---

**The Computer System**

What most people commonly call a “computer” is technically an entire *computer system*—the computer itself plus other connected machines. But a computer system is more than just machinery; it includes operating instructions, application programs, and a person to operate the system. Therefore, a computer system can be broken into three integral parts: the hardware, the software, and the end user(s).
Hardware

Hardware consists of physical equipment; parts you can see and touch. There are three basic configurations of Macintosh hardware: modular, compact, and portable. Figure 1.1 shows a modular Macintosh. Its central processing unit and disk drives are housed together, separate from its monitor, keyboard, and mouse. Compact Macintoshes, such as the Mac Plus, Mac SE, and Mac Classic, have most of their components (each individual piece of hardware) in a single case, with a separate keyboard and mouse. Portable Macintoshes, like the PowerBook, incorporate all components except the printer into a lightweight, two-part, fold-up case.

Apple Computer, Inc. has released many different Macintosh models since 1984. Macintoshes are compatible; that is, given the proper setup, information created on one Macintosh can be loaded and transferred onto any other.

![Figure 1.1: A Macintosh Quadra 605 and LaserWriter printer](image)

Software

Computer hardware cannot operate without instructions. Software, or application programs, are the instructions that direct the computer to perform specific tasks, such as calculating the sum of eighty-five numbers or printing three pages of text.

Macintosh software consists of a set of commands, operator-initiated signals that control a specific computer function. Using existing application programs, you can select commands to operate the computer.

Users

End users, or simply users, are the people who ultimately operate or use the computer system—you and me. Personal computer systems are interactive computing systems; the hardware, the software, and the end user work together to get the job done.
The Macintosh is relatively easy to use. Steven Jobs conceived of the Macintosh as an "appliance" computer that someone like yourself could plug in, turn on, and use like a toaster or a washing machine. The steps you follow to connect your Macintosh components and turn them on depend on the type of system you use.

**Starting up**

As you turn on your system, it chimes to let you know that it is on. It then begins an automatic routine called *starting up* to prepare itself for use. Starting up begins with a *self-test* in which the Mac automatically checks its hardware. Once the Mac passes this self-test, it displays its Happy Mac picture.

The Happy Mac signifies that the Macintosh has found its startup disk and is loading its operating system software. *Operating system software* starts the computer, manages its internal functions, displays information on the monitor, retrieves and stores information, and keeps data organized. Since the Mac does not retain these instructions when the power is shut off, it needs to reload its operating system software whenever it starts up. The *startup disk*, usually the hard disk, contains the operating system software.

Next, the Happy Mac is replaced by a *startup screen* while the computer continues to load the operating system software. Startup screens vary. Your computer screen might read "Welcome to Macintosh" or might show a custom-designed image.

When the Mac finishes starting up it displays the special screen shown in Figure 1.2 called the *Macintosh Desktop*. Your screen may not display the Trash icon in its lower right corner. Macintosh computing environments vary, sometimes substantially. If you have a new computer system that you have set up according to Apple Computer, Inc.'s instructions, and if you are the only user, the Desktop should resemble Figure 1.2. If your system runs the At Ease application program, if...
you are in a computer laboratory, or if your screen saver is activated, you may see a screen other than the Desktop shown here.

**Computer Laboratories**

To control their shared hardware and software, some computer laboratories use *passwords*, key sequences that you must type into the computer before you can use it. If you are working in a computer laboratory, you may have to follow additional steps to get to the Macintosh Desktop.

**Software Variations**

When you do find the Desktop screen, the names and icons you see will not be identical with the Desktop illustrations in this book. This is because nearly every Macintosh system uses different software. There are literally thousands of software packages, and only a few will be part of any given system.

**Screen Savers**

Most laboratories operate their computers for long durations, and use special software called *screen savers* to protect monitors when they are not in use. These small software programs prevent nonchanging screen images from being burned into the screen phosphors by blanking, by dimming, or by constantly moving the screen image. Macintosh programmers have had great fun developing a huge variety of screen savers, ranging from blinking dots to flying toasters.

If you are working in a computer laboratory or other network situation, your Macintosh’s screen saver may already be active. To **deactivate** (turn off) a screen saver and view your regular screen, roll the mouse slightly or press a key on the keyboard.

As you work at the computer, the screen saver will activate automatically if the monitor doesn’t change for a predetermined period of time. When you deactivate the screen saver, your regular screen will be restored. Your work will not be lost.

---

**The Macintosh Desktop**

The Macintosh Desktop represents your computer workspace. Think of it as the top of your computer “desk” holding your papers, files, and folders. Begin by identifying the major Desktop landmarks.

**The Menu Bar**

To use the computer, you instruct it to perform a specific task or series of tasks. Each of these instructions is called a command. At the top of the screen is a row of words and symbols called the *Menu bar* (Figure 1.3). Each word or symbol is the *Menu title* for a command list.
PULL-DOWN MENUS

Similar to a restaurant's menu, each Macintosh menu title allows you to display and to choose from a command list. Related commands are grouped functionally under their menu titles to make them easier to find. Each command list is called a pull-down menu because you use the mouse to pull-down the list and choose the command you want (Figure 1.4).

MENU COMMAND DESIGNATION

Choosing a menu command is a two-step process: first choose the menu title, and then choose the command from the drop-down list. In this text, a slash separates the menu title and menu command, such as “Choose View / By Icon.”

Icons

The Desktop uses pictures called icons to represent hard disks, floppy disks, application and document files stored on those disks, the trash icon, and organizational place holders called folders. Figure 1.5 identifies some common Desktop icons.

In Figure 1.2, the icon in the upper-right corner of the Desktop, just below the Menu bar, is the startup icon. It represents the disk that contains the operating system software the Macintosh used to create its Desktop, such as Hard Disk in Figure 1.2.
**Windows**

Most Desktop icons can be "opened" to reveal a window, a rectangular on-screen frame that displays its contents. Your Desktop may have one or many open windows. Figure 1.6 shows a Desktop screen with its startup disk, Hard Disk, opened to display its window.

**Figure 1.6**
The Macintosh Desktop with an open window

- File
- Edit
- View
- Label
- Special

**Hard Disk**
- 12 items
- 89.5 MB in disk
- 9.2 MB available

- Applications
- Graphics
- Utilities

- Book
- Classes
- Games

- System Folder

**The Mouse**

The mouse, shown in Figure 1.7, is a small device that lets you operate the computer without memorizing a list of esoteric key commands. It is called a mouse because it has a tail, a cord that connects it to the computer.

The mouse controls the on-screen position of its arrow-shaped icon, called the pointer. As the mouse moves, its arrow-shaped pointer moves accordingly.
Only some of the pointer actually points. One tiny *pixel*, or on-screen dot, at the tip of the arrow, $\frac{1}{2}$ of an inch square, registers its position. This pixel is called the *hot spot*.

Place the hot spot directly over the item you wish to select. Figure 1.8 shows how critical the pointer's position can be. When pointing to an icon, the hot spot must be inside the icon; when pointing to a box, the pointer hot spot must be inside the box.

![Figure 1.8 Pointer positions](image)

**GUIDED ACTIVITY 1.1**

**Using the Mouse**

The *mouse pad* is a special piece of matting that gives proper roller ball traction and protects the mouse from wearing out prematurely. The mouse pad is helpful, but not required. These instructions are written for mouse pad users. If your computer lacks one, clear a space about a foot square to the right or to the left of your keyboard for the mouse.

1. Place the optional mouse pad to the right or left of the keyboard.
2. Place the mouse in the middle of the mouse pad, with its tail away from you, free of obstacles such as books and papers.
3. Locate the arrow-shaped pointer on your screen.
4. Cup your relaxed hand over the mouse with your index finger resting gently on the mouse button without pressing it. Rest the heel of your hand comfortably on the mouse pad (see Figure 1.9).

![Figure 1.9 Hand position on the mouse, index finger over the mouse button](image)

5. Gently roll the mouse to the left, up, right, and down on the pad. Watch the pointer's position change correspondingly.
Touring the Macintosh

Every new Macintosh comes with a program called *Macintosh Basics*. This tutorial is like a Macintosh “flight simulator;” it lets you pilot the Mac without crashing. *Macintosh Basics* introduces you to the Desktop landmarks, familiarizes you with the use of the mouse, and teaches you to manipulate icons, windows, and menus. It also previews many of the skills you will soon develop.

**GUIDED ACTIVITY 1.2**

Using the *Macintosh Basics* Tutorial

Guided Activity 1.2 shows you how to locate, activate, and use the tutorial. In the process you will learn these basic mouse actions: point, click, press, drag, and double-click. Begin with your computer turned on, at the Desktop.

**NOTE** *Different people complete the tutorial at different rates. It is not necessary to do it all in one sitting. If you wish to stop before completing the tour, skip ahead to step 12, and return to the tour another time.*

1. Check your Desktop for open windows.

   Someone using the computer before you may have left some windows open. If your screen has any open windows (see Figure 1.6), proceed to step 2; if not, skip ahead to step 3.

2. Close open windows.
   a. Locate the close box in the upper-left corner of the top open window (see Figure 1.6).
   b. Roll the mouse on its pad until the pointer’s hot spot is inside the box.
   c. Press the mouse button once and release. The window should close.
   d. Repeat steps a–c until all windows are closed.

3. Click the Desktop workspace.
   a. Roll the mouse until its pointer is below the Menu bar, but not on top of any icons.
   b. Press the mouse button once and release.

4. Select the Hard Disk icon. (It may have another name and shape.)
   a. Point: roll the pointer so that its hot spot touches the Hard Disk icon.
   b. Click: press and release the mouse button.

   The Hard Disk icon will change colors, or *highlight*, to indicate that it has been chosen, or *selected*. 
5. Open the Hard Disk icon to display its window.
   a. Point to the Menu title File on the Menu bar, as in Figure 1.10.
   
   ![FIGURE 1.10](image)

   **FIGURE 1.10**
   Pointer on top of File Menu title

   b. Press the title File. Press the mouse button and keep it down until you complete the next step.

   The drop-down menu shown in Figure 1.11 will appear.

   ![FIGURE 1.11](image)

   **FIGURE 1.11**
   The File Menu drops down

   Some of the menu items are black, and others are gray. Gray menu items are not available currently. For example, in Figure 1.11 Close Window is gray because there are no open windows to close.

   c. Choose File/Open. (Choose Open from the File menu.)

   i. Drag the pointer to the command Open: hold the mouse button down as you move the mouse straight down the list (drag down) until the command Open highlights (see Figure 1.12).

   ![FIGURE 1.12](image)

   **FIGURE 1.12**
   Choose File/Open
ii. With the Open command highlighted, release the mouse button to execute the Open command. The Hard Disk window should open on the Desktop.

**NOTE** If you accidentally slide the pointer off to the side instead of straight down the menu list, the command will not execute. In that case, repeat step 4, taking care that the pointer is within the menu list before you release the mouse button.

6. Locate the Macintosh Basics folder icon in the Hard Disk window (see Figure 1.13).

7. Open the Macintosh Basics folder.
   a. Point to the Macintosh Basics folder.
   b. Click the Macintosh Basics folder.
   c. Choose File/Open. (Choose Open from the File menu.) The Macintosh Basics window should open on the Desktop.

8. Locate the Macintosh Basics application icon.

9. Open the Macintosh Basics application program to start the tutorial.
   a. Point to the Macintosh Basics application icon.
   b. Click the Macintosh Basics application icon.
   c. Choose File/Open.

10. Locate the (Return) key on your keyboard (see Figure 1.14).

11. Read the first screen and then press (Return). (Return) moves you from screen to screen in the beginning of the tutorial.

12. Follow all the on-screen steps of the Mouse Skills tutorial until you reach the Main Topics screen shown in Figure 1.15.

13. If you want more mouse practice, click Repeat Mouse Skills section and repeat the tutorial. Otherwise, proceed to the next step.
14. Click Getting Around in Macintosh Basics to choose the first main topic. Follow its instructions.

15. Complete each of the Main Topics in turn by first clicking the topic and then following its instructions.

16. To Quit the tutorial:
   a. If your screen looks like Figure 1.15, proceed to step b. Otherwise, click the Topics button to reach the Main Topics screen.
   b. Click Quit Macintosh Basics. A box containing the message in Figure 1.16 will appear.

On-screen choice boxes like Yes and No are called buttons. To press a button, point and click.

c. Click Yes to return to the Desktop, ready to end the session.

Ending Your Computing Session

Choose Special/Shut Down from the Menu bar before turning off the power to your computer system. This command preserves the Desktop environment and locks or parks the hard drive(s). Some Macintosh systems turn off automatically
after you choose Special/Shut Down. Others display a screen letting you know when it is safe to turn off your computer. You may have to turn off each component separately.

The Special/Restart command is often used in a lab or other environment where computers stay on all day and where different users have different passwords. When used on computer systems with passwords, the Special/Restart command momentarily turns off the power and then re-starts the computer to the password screen for the next user.

**Using Your System Wisely**

As a new user, you should learn to care for your system, keep it in good working order, and maintain a healthy computing environment.

**Taking Care of Your Hardware and Software**

The computer is not very fragile, but it will break if you drop it. Here are some other potential problems.

**DUST AND SMOKE**

Most of the computer’s internal parts are encased to minimize dust problems. Nevertheless, dust can creep inside through cracks and crevices. Be particularly careful to keep dust off your floppy disks. Small particles inside the floppy disk case can cause the disk to lose information. Smoke particles are 4–5 times smaller than dust and dirt particles, and can sneak into smaller cracks. Try to keep smokers away from your computer system.

Keep your computer clean. At least once a month, remove accumulated external dust and dirt. With the system turned off, wipe the surfaces of your computer, printer, desk, and surrounding areas with a soft, dry cloth.

**MOISTURE**

Your computer will run well in a range of 5 percent to 95 percent relative humidity. Noncondensing humidity, however, differs from moisture. Moisture harms most electronic devices, including computer systems. Unless you have a portable computer, the most likely sources of moisture are food and drink. Many people have spilled coffee or soft drinks onto their computers or keyboards, requiring expensive repairs.

If you spill something on your computer, immediately turn the computer off. If the liquid is thin and not sticky, let the computer dry for 24 hours before you attempt to use it. If the substance is greasy, syrupy, or sticky, Apple Computer, Inc. recommends that you have the dirty parts repaired before attempting to use the computer again.
HEAT AND COLD

Your computer may be stored safely at temperatures between -40 degrees F to 116 degrees F and operated at temperatures between 50 degrees F and 104 degrees F. If the computer gets colder than 50 degrees F, it may not start until it reaches 50 degrees F, but it won’t be damaged.

Heat, however, can cause serious problems. When a Macintosh has been running for a long time, its internal temperature rises about 15 degrees F above room temperature. Since the Mac’s top safe internal temperature is 125 degrees F, don’t turn it on in a room hotter than 104 degrees F. (The range allows for a safe temperature margin.) Although you won’t see immediate problems, heat shortens the life of your computer; cool chips last longer. This is why computers are often placed in temperature-controlled rooms.

Heat also affects floppy disks. Extreme heat can ‘melt’ the information on a floppy disk and make it unusable. Take care not to leave your disks in a sealed car on hot days.

If a disk accidentally becomes very hot or very cold, let it come to room temperature before use.

VENTILATION

All Macintosh components have air vents that allow internal heat to flow out. Poorly ventilated machines will overheat and fail. To ensure good ventilation, keep a 4–6 inch clearance around all air vents. Don’t set anything, even a piece of paper, on top of or near the vents. Don’t put your computer next to a bookcase or wall, and don’t pile books or manuals against its vents.

MAGNETS

Floppy disks store information magnetically, and external magnets can scramble that information. Therefore, keep magnets and electromagnets at least 12 inches away from your disks. Common office objects with magnets or electromagnets include: telephones, answering machines, stereo speakers, portable radios (including Sony® Walkman™), magnetized paper clip dispensers, magnetized screw drivers, and vacuum cleaners.

MOTION

Certain parts of the computer, especially disk drives, can be damaged if moved or bumped while they are operating. If possible, keep your computer out of areas with high foot-traffic. Turn off your components before moving them.

POWER SURGES

Recommended for every computer system, surge protectors are special devices that protect your computer against sudden variations in electrical current called power surges. Surge protectors offer some protection against many power
anomalies, but only very expensive surge protectors can protect your computer against the strong electrical currents generated by lightning storms.

Lightning can travel through electrical cords and phone lines even if your computer is turned off. If an electrical storm occurs while you are using the computer, simply turn off and unplug your system. Keep it unplugged until the storm is over. If you live in an area with frequent electrical storms, get in the habit of unplugging your entire system and de-connecting computer-telephone lines whenever your system will be off for more than a day or two.

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**Taking Care of Yourself**

The most important piece of computer equipment you have is yourself! Computers can be so engaging that it is easy to forget how long you have worked at the machine. Without care, you can stay in one uncomfortable position until you strain your back, neck, or eyes. Pay close attention to your work environment to prevent or minimize these problems.

More than half of all surveyed computer users have complained of musculoskeletal disorders, eyestrain, chronic headaches, or other ailments. So many people have work-related complaints that the science of **ergonomics** has developed to study the physical relationship between people and their work environment. The recommendations that we make here may change, as ergonomics experts learn more about the effects of computer usage on human health and well-being.

**Maintaining Good Posture**

Posture follows the eyes. Adjust your workstation so that your head is in a comfortable, unslouched position. You can improve your posture and prevent back and neck strains with well-made computer-oriented furniture.

**CHAIRS**

Each person has a unique optimal comfort position. A computer chair should have good support, with adjustable seat, back, and arm heights and adjustable angles. The seat of your chair should be low enough so that your feet rest flat on the floor or on a foot rest (crossed legs obstruct circulation). Your thighs should be parallel to the floor, with your hips slightly flexed and your knees bent, so that the angle between your upper and your lower legs is between 60 degrees and 100 degrees (see Figure 1.17).

**DESKS**

For all but the tallest individuals, standard tables and writing desks are too high. Your computer desk or table should be low enough so that your forearms are parallel to the floor.
MONITORS

You should be able to see your monitor comfortably without raising or lowering your neck. To achieve this height, the top of the monitor should be at or slightly below eye level.

Macintosh screens are typically too low. An inexpensive way to raise the monitor or a whole compact Mac is to place a large telephone book or block of wood under it.

The distance between you and the monitor is also critical. Try and keep the monitor 18 inches to 28 inches away from your eyes.

TELEPHONES

The benefits of the best computer furniture can be negated if you cradle a telephone receiver between your head and your shoulder, and strain your upper body muscles. Telephone operator headsets can preserve your good posture.

Using Even, Indirect Lighting

Appropriate lighting makes it easier to read the computer screen and prevents eye strain. Even, indirect lighting minimizes glare on both your computer screen and your reference documents. Use half the level of normal office lighting. To avoid reflections, don’t place your workstation directly beneath overhead lighting.
Avoiding Screen Glare

If possible, position your computer so that the screen is at a 90-degree angle from any windows. Windows directly behind the computer shine daylight into your eyes. Window shades, drapes, and screen guards can minimize glare.

Taking a Computer Break

Even with appropriate furniture and lighting, many computer users suffer from repetitive strain injuries (RSI) to their hands and wrists (carpal tunnel syndrome or tendonitis), arms, or necks. These injuries occur because nearly identical keystrokes are often repeated at a high rate of speed over a long period of time.

By periodically stopping the repetitive actions, it is believed that you help prevent injury. Give your body a five-minute computer break at least once an hour. Stand up and stretch. Move your shoulders and roll your head to stretch your neck. Walk around. Leave the room if possible.

**NOTE** Moving from your computer to a desk does not provide a break. Also, reading a book, writing a letter, or doing other close work does not provide a break.

Being Realistic About Your Progress

Even though modern personal computers are “user-friendly,” be realistic and don’t expect to master the machine and its many functions in a week. Like so many other things worth learning, it takes the three P’s—practice, persistence, and patience—to develop good computer skills.

Summary

Computers are machines or tools that amplify human abilities to perform a wide variety of tasks, both at home and in the workplace. Each computer system has three integral parts: the hardware, the software, and the end user.

In this first unit, you started up your system, worked with icons and windows on the Macintosh Desktop, and developed mouse skills. You used the Macintosh Basics tutorial to open an application, to create a simple document, to manipulate windows, to choose from pull-down menus, to work with more than one program, to get help, and to throw things away. When you were done, you ended your computing session properly.

Finally, you found out how to take care of your computer system, including yourself. You learned to keep dust, smoke, moisture, magnets, and extreme heat and cold away from your system. You discovered that physical comfort helps prevent repetitive strain injuries, and that you should take a five-minute computer break every hour.
Command Review

Start up turn on your computer and follow any special steps to reach the Desktop

Point roll the mouse to point at a specified on-screen object

Click press and release the mouse button

Click an object point to the object and then click

Double-click rapidly click twice in succession; a shortcut used to select and to open icons simultaneously

Press press the mouse button and keep it down

Drag hold the mouse button down as you move the mouse

Select click an object to highlight it

Choose pick a command from a menu list; this is a two-step process—first, press the menu title, then drag to the command itself and release the mouse button

Restart choose Special/Restart; turns the power off briefly, and on again to reload the operating system software for a fresh start

Shut Down choose Special/Shut Down; command will either turn the computer off, or tell you that it is OK to turn it off

**NOTE** A slash separates the Menu title from the command in this text; for example, choose Special/Shut Down means choose the Shut Down command from the Special menu.

Exercises

The following exercises review your understanding of Macintosh fundamentals.

Examine your computer and your working environment. Begin with your system turned off.

1. Make sure your system is ergonomically appropriate.
   a. Try to locate your Macintosh in an area with appropriate lighting and ventilation.
   b. Sit down at your computer. Notice how you normally sit.
      Each person has a different optimal comfort position.
   c. Adjust your chair height so that your wrists are lower than your elbows.
d. Place the mouse and pad to either the left or the right of the keyboard, in a comfortable position. Make sure the mouse cord moves freely.

e. Check your screen height.

The part of the monitor screen that you use most often should be at eye level. If it is too low, place something under it.

f. Start up your Macintosh and examine the monitor for screen glare.

If glare hampers your screen's visibility, close blinds, reposition adjustable lights, or consider moving the system, if possible. (Shut down your system before moving it.)

2. Identify your system.

a. What is your basic system type: modular, compact, or portable?

b. What model Macintosh are you using?

The model should be somewhere on the outside of the case. If you are unsure, choose the command /About This Macintosh. The dialog box will tell you the model, such as the Macintosh II in Figure 1.18.

---

**Review Questions**

The answers to odd-numbered questions are contained in Appendix A.

**Multiple Choice**

1. This textbook defines a computer as

   a. an electronic machine that processes information

   b. a machine with intelligence

   c. a contrary contraption

   d. a machine that can do everything a person can do
2. Which of these is not hardware?
   a. a disk
   b. the operating system
   c. the keyboard
   d. the mouse
3. The purpose of the Macintosh Basics tutorial is to
   a. teach you all there is to know about the Macintosh in thirty minutes
   b. teach you how to use the mouse
   c. provide an overview of Macintosh computing
   d. b. and c.
4. The Macintosh Desktop displays small graphics called icons. Icons can represent
   a. a disk
   b. a folder
   c. a file
   d. any of these
5. Appropriate lighting and good posture are important aspects for your computer work. Which of the following is most beneficial to your vision?
   a. placing the monitor in front of an uncovered window
   b. placing the monitor at or slightly below eye level
   c. strong overhead lighting
   d. directing a lamp at the monitor

**True or False**

1. **___** Computers can process information faster than people.
2. **___** Shut Down is a menu command.
3. **___** Many people enjoy using the Macintosh rather than other personal computers because they like memorizing commands and typing them on the keyboard.
4. **___** The Desktop displays icons (pictorial representations).
5. **___** Using a computer is easier to do when the end user understands the steps that the computer must take to do its work.
Fill in the Blanks

1. The field of ergonomics studies the working conditions of people as they use machines. The user in Figure 1.19 is not using this computer wisely. After each word, explain what would improve this working environment.

Problem and Solution

a. Window
b. Desk
c. Chair
d. Arm
e. Feet
f. Telephone
g. Monitor
2. Identify the Desktop landmarks in Figure 1.20.

FIGURE 1.20

Desktop quiz

- a. __________________________
- b. __________________________
- c. __________________________
- d. __________________________
- e. __________________________
Key Terms

The following terms are introduced in this unit. Be sure you know what each of them means.

<table>
<thead>
<tr>
<th>Application program</th>
<th>Icon</th>
<th>Interactive computing system</th>
<th>Portable Macintosh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command</td>
<td></td>
<td>Macintosh Basics</td>
<td>Power surge</td>
</tr>
<tr>
<td>Compact Macintosh</td>
<td></td>
<td>Menu bar</td>
<td>Pull-down menu</td>
</tr>
<tr>
<td>Compatible</td>
<td></td>
<td>Menu title</td>
<td>Repetitive strain injury</td>
</tr>
<tr>
<td>Component</td>
<td></td>
<td>Modular Macintosh</td>
<td>Screen saver</td>
</tr>
<tr>
<td>Computer</td>
<td></td>
<td>Mouse</td>
<td>Selected</td>
</tr>
<tr>
<td>Computer system</td>
<td></td>
<td>Mouse pad</td>
<td>Self-test</td>
</tr>
<tr>
<td>Deactivate</td>
<td></td>
<td>Operating system</td>
<td>Software</td>
</tr>
<tr>
<td>Desktop</td>
<td></td>
<td>Parks</td>
<td>Starting up</td>
</tr>
<tr>
<td>End user</td>
<td></td>
<td>Operating system</td>
<td>Startup disk</td>
</tr>
<tr>
<td>Ergonomics</td>
<td></td>
<td>software</td>
<td>Startup icon</td>
</tr>
<tr>
<td>Folder</td>
<td></td>
<td></td>
<td>Startup screen</td>
</tr>
<tr>
<td>Gray menu item</td>
<td></td>
<td></td>
<td>Surge protector</td>
</tr>
<tr>
<td>Hardware</td>
<td></td>
<td></td>
<td>User</td>
</tr>
<tr>
<td>Highlight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot spot</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Unit 1 gave you an introductory tour of the Macintosh. Unit 2 prepares you to work. First, you will examine the computing process: input, processing, output, memory, and storage. Then, you will manipulate and care for floppy disks and measure the capacity and size of files and disks using the computer’s binary measurement system. Finally, you will create a working backup copy of the West Student Data Disk files.

**NOTE** You will need a new 3.5-inch floppy disk to complete the guided activities in this unit.

---

**Learning Objectives**

At the completion of this unit you should know

1. the basic parts of the computing process: input, processing, output, memory, and storage,
2. how to create, use, and care for floppy disks,
3. why stored data must be backed up.

At the completion of this unit you should be able to

1. manipulate a floppy disk:
   a. lock and unlock it,
   b. initialize and label a new floppy disk,
The Computing Process

It is not necessary to know how a computer works to use it. However, you can use the computer most effectively if you understand its basic functions. The term personal computer acknowledges that a person is a key link in the computing process. All computing can be divided into four steps: processing, input, output, and storage.

Processing

The main job of a computer system is to transform raw data, letters or numbers used individually or in combination to represent facts or events, into information, a set of data that is meaningful to the computer user. This transformation of data into information is called processing and occurs in the Mac’s central switching station known as the central processing unit or CPU.

Input

Before it can compute, the central processing unit (CPU) needs to receive your raw data and to be instructed on how you want the data manipulated. Input is the entering of data into the computer. Input devices, such as the mouse, the keyboard, and the track ball, send your data and instructions into the CPU.

Output

Output is the displaying of processed results. After the computer processes its data, it sends the results to another device, such as a monitor or a printer. The personal computer’s primary output device is the monitor, a video display unit resembling a television screen. Printers display computer information as hard copy or printouts—printed text and pictures.

Interactive Computing

As you input data through the keyboard or mouse, the CPU processes and outputs electronic impulses onto the monitor screen. As you view the output, you can correct typographical errors and make other necessary changes. This interactive process is called feedback. Feedback is a form of output that immediately cycles back to the system’s input or processing areas for modification. Macintosh computing is interactive computing—dependent on user feedback. You must have
a keyboard and a mouse for input, and a monitor for output to complete the Mac­intosh feedback cycle, shown in Figure 2.1.

Monitor output may be immediate, but you can only view the results one screen at a time, you must be in front of the computer, and the results are not "permanent." Although not part of interactive computing, printers provide hard copy output, the intended goal of most computing projects.

**Refining the Computing Process**

Have you wondered what happens to the numbers, letters, and mouse actions you input into the computer? The computer places this information into special chips called *memory* that the CPU can access and manipulate.

**Memory**

Modern computers use a special kind of memory called *random access memory*, or *RAM*, to hold data and information electronically. Figure 2.2 illustrates a Macintosh RAM chip, or single in-line memory module or *SIMM*.

Because random access memory (RAM) is electronic, the computer can access and manipulate its contents very rapidly, in *nanoseconds* or billionths of a second. However, RAM can only hold data as long as it has electrical power. If power is lost or shut off, even for a few seconds, each RAM chip loses everything it holds. Therefore, when you Shut Down or have a power failure, whatever your RAM held during your work session vanishes, permanently.

To save your work from one computing session to another, your computer needs a more permanent way to "remember." It needs storage.
Storage

Storage is the retention of program instructions, data, and processed information from one computing session to another. Since the Macintosh command for storing your work is save, we will use save interchangeably with store. Storage media are materials that are capable of retaining data and instructions without electrical power. The most common storage medium for personal computers is the disk. Disks are flat, circular objects resembling phonograph records that are covered with a special magnetic oxide coating that can retain information.

Disks are usually divided into two categories, floppy disks and hard disks. Floppy disks are made of flexible mylar. Hard disks are made of rigid aluminum platters and can hold much more data than floppies.

The Relationship Between Memory and Storage

Whenever you retrieve work from storage, the computer places a replica of that work into RAM for processing. When you finish processing and save your work, the computer replicates your processed results onto your storage disk.

If magnetic disks can retain files without power, why does a computing system use RAM at all? There are two reasons: time and money. RAM chips are used because processing would take one thousand times longer using magnetic disks alone. Therefore, RAM computing is time-efficient.

However, RAM chips cost roughly ten times as much as magnetic storage media. Since you can't and don't need to use all your work at once, you keep most of it stored on disk. When you need something you move it to RAM. This RAM-storage interplay is cost-efficient; each computer system requires considerably less memory than storage.

Files

A file is computer work that is saved to a disk. Each file is a discrete unit; its contents are distinct from the contents of other files. Each file is named so that you can find it again.

Reading and Writing

When a disk drive retrieves a saved file from a disk, it is said to read that file. File retrieval places an exact replica of some or all of a stored file into RAM for manipulation. You have already retrieved stored files. The Macintosh Basics tutorial contains files that were created and stored for you. When you use the pull-down menu command File/Open Macintosh Basics, you actually place duplicates of these files into RAM.

When the disk drive names and places a replica of a RAM file onto a storage medium such as a hard disk or floppy disk, it is said to write that file. When you use the command File/Save in Unit 3, you will write files to your floppy disk.
A storage device performs the actual reading and/or writing of storage media. Storage devices called disk drives perform the actual reading and writing of files. Disk drives are also called input/output, or I/O, devices because they can both read (input) and write (output) files.

Figure 2.3 adds memory and storage to the computing process diagram in Figure 2.1.

Floppy Disks

Floppy disks are thin, flexible, mylar storage disks. Each disk is covered with a magnetic coating that stores computer instructions and data. Floppy disks are portable and can transfer information between computers.

The Macintosh’s 3.5-inch floppy disks are encased in protective rigid plastic cases, with a shutter that shields the disk from dust and other contaminants, as shown in figure 2.4. When you place or insert a floppy disk into the disk drive, the disk’s shutter automatically opens to give the disk drive access to the flexible disk itself. When you remove or eject a disk from the disk drive, the shutter automatically closes to protect your files.
Guided Activity 2.1 shows you how to insert a floppy disk, identify its icon, open the disk’s window, close it, and eject the disk. Begin at the Desktop.

1. Obtain a Macintosh floppy disk from your instructor or laboratory personnel. (Any disk will do.)

2. Familiarize yourself with its major components, shown in Figure 2.4.

**NOTE** As you examine the disk, be careful not to open the closed shutter that protects the flexible disk from dust and other contaminants.

3. Every floppy disk has the **lock-unlock tab** (also called a **write-protection tab**) shown in Figure 2.5. With your fingernail or a push pin, slide the lock-unlock tab back and forth in its groove. To **unlock** a disk so that its contents can be changed, move its tab to cover the hole. To **lock** a disk, move the tab so that you can see through the hole.

4. It is important to preserve some disks, such as application software, in their original state. When you lock a disk, the computer can retrieve or copy its information, but cannot change its contents.

5. Insert your floppy disk.
   a. Hold the disk so that the label faces the ceiling, with the insert arrow and shutter pointing towards the drive slot.
   b. Push the disk all the way into the drive slot, label side up and shutter first as shown in Figure 2.6. The drive seems to grab the disk when you push it in.
   c. Wait for the computer to read the disk’s contents and to place its **disk icon** somewhere below the Startup Disk icon.
6. Open the disk to see its window.
   a. The disk should already be highlighted. If it isn’t, click its icon.
   b. Choose the File/Open command. The disk icon will turn gray to show that its window is open.

7. Choose File/Close Window to close the disk window. The disk icon will return to its original appearance, to show that its window is closed.

8. Eject your floppy disk; “Drag the Disk through the Trash.”
   a. Drag the disk icon on top of the Trash icon. Only the outline moves. When you have reached the proper position, the Trash icon will highlight.
   b. Release the mouse button.

   Two things will happen. The disk drive will make a mechanical sound and push the disk about an inch out of the drive slot so that you can retrieve it. The disk icon will disappear from the Desktop.

   **NOTE** Don’t worry about dragging your disk icon through the Trash. It’s only removing the icon of your disk and its table of contents from RAM; the disk’s stored files remain intact.

**Unwanted Disk Icons**

Occasionally, you may use a computer that has the shadow or *ghost* of someone else’s disk on your screen. It is called a ghost because although you can see the disk’s icon, the disk itself is not in the computer.

To remove an unwanted ghost icon from your Desktop, drag it onto the Trash icon. If the computer asks you to insert the disk (that you probably don’t even have), hold down the `Esc` key and then type the period key `. The `Esc` combination bypasses the insert disk message shown in Figure 2.7.
Preparing a New Floppy Disk

You need to prepare a new floppy disk to hold your work. To do so, you have two preparatory tasks. First, you must obtain the proper disk for your system, and then you may need to initialize or prepare the disk for storage. (Some people use the term format instead of initialize.) Let's take each step in sequence.

Choosing the Right Floppy Disk for Your Drive

In the ten-year history of the Macintosh, Apple Computer, Inc. has made three different kinds of floppy disk drives for the Macintosh. As Table 2.1 shows, each drive can use a different set of 3.5-inch floppy disks.

Single-sided drives or 400K drives can read and write to only one side of a disk. Single-sided disks hold only 400K and are virtually obsolete. From the outside, they look like Figure 2.4. Some single-sided disks have the initials SS/DD (single-sided/double-density) printed on them. Single-sided disks are also called 400K disks.

Double-sided (800K) drives can read both the top and bottom side of a floppy disk. Double-sided drives can use either double-sided or single-sided disks. The West Student Data Disk is a double-sided disk. Since single- and double-sided disks have identical cases, most double-sided disks have the initials DS/DD (double-sided/double-density) or the words double-sided printed on them to distinguish them from single-sided disks. Double-sided disks are also called 800K disks.

Older Macintoshes such as the Macintosh Plus, the Macintosh SE, or the original Macintosh II have double-sided drives (800K drives) that can read both the top and bottom side of a floppy disk. Double-sided drives can use either double-sided or single-sided disks. The West Student Data Disk is a double-sided disk. Since single- and double-sided disks have identical cases, most double-sided disks have the initials DS/DD (double-sided/double-density) or the words double-sided printed on them to distinguish them from single-sided disks. Double-sided disks are also called 800K disks.
Newer Macintoshs have SuperDrives. SuperDrives are very versatile; they can read and write high-density or 1.4MB disks, single- and double-sided disks, and 3.5-inch disks that have been set up for IBM computers. High-density disks look almost like double-sided disks, except that they have an extra hole in the case and the letters HD printed on them. They are also called HD disks (see Figure 2.8).

DRIVE INCOMPATIBILITIES

Do not place a high-density disk into a double-sided drive. The double-sided drive cannot read your high-density disk so your computer will ask to format as an 800K disk. To do so will to erase any data already stored on the disk. You can use an improperly formatted high-density disk in that manner, although it will not be as reliable as a true 800K disk and you will waste storage space because the disk could have held more information. The biggest problem occurs when you place the improperly formatted high-density disk into a SuperDrive. The Macintosh becomes confused and asks to erase the disk again to create a 1.4MB disk.

NOTE If you use a variety of Macintosh computers and some of them lack a SuperDrive, you will have less confusion if you avoid high-density disks.

INITIALIZING DISKS

The Macintosh cannot use a new, unformatted floppy disk right out of the box. First, the disk needs to be set up for the Macintosh. This process, called initialization, creates landmarks called tracks (concentric circles) and sectors (wedges) that let the computer know where to store and where to retrieve files on the disk (Figure 2.9).

In creating the tracks and sectors, the initialization process, also called formatting, erases any information already on the disk. Therefore, you typically initialize a disk only once, the first time it is used.
Formatting a Macintosh disk is simple. Whenever you insert an unformatted disk into an operating computer, the computer temporarily stops whatever it is doing and automatically leads you through the initialization steps.

**GUIDED ACTIVITY 2.2**

*Initializing a Double-Sided Floppy Disk*

In Guided Activity 2.2, you will initialize and label a new double-sided floppy disk. This disk becomes your *Data Disk* and will hold your student files.

1. Obtain a new, double-sided floppy disk and gummed paper label.
2. Double-check your disk to be sure it is *not* a high-density (HD) disk. Double-sided disks have only one hole through the case (the lock-unlock tab) and do not say HD anywhere.
3. Insert the unlabeled disk into the disk drive.
4. Wait for the dialog box shown in Figure 2.10 to appear.

**FIGURE 2.10**  
*A dialog box*

```
This disk is unreadable:  
Do you want to initialize it? 

Eject  One-Sided  Two-Sided
```

*Dialog boxes* are bordered messages that appear on screen to request more information from you or to allow you to choose from options. The dialog box in Figure 2.10 asks you to choose from the Eject, the One-Sided, or the Two-Sided buttons.

5. You want your disk to be two-sided (800K), not one-sided (400K), so click Two-Sided. The dialog box in Figure 2.11 will appear.

**FIGURE 2.11**  
*The erase disk dialog box*

```
This process will erase all information on this disk.

Cancel  Erase
```

Initialization erases all the information on your disk, so another dialog box gives you a second chance to change your mind.
6. Since your disk is blank (new), click Erase. The dialog box in Figure 2.12 will appear, for you to name your disk. You can give your disk any name you like, up to 31 characters. Shorter names take less room on the Desktop. If you do not change the disk’s name, it will be called Untitled, like Figure 2.12.

7. Enter the name Data Disk from the keyboard, as shown in Figure 2.13.

**NOTE** Although theoretically you can give this disk any name you choose, it will be referred to as “Data Disk” throughout this text. It will be easier to follow Guided Activity instructions if you use the same name. The highlighted word Untitled will disappear, replaced by the name you type.

8. Click OK. Wait while the computer writes tracks and sectors, verifies or checks to be sure everything is OK, and places an invisible table of contents called the directory on your disk. If everything is satisfactory, the disk’s icon will appear on the Desktop, as shown at left.

9. Drag the disk’s icon through the Trash to eject the disk.

**BAD DISKS**

In rare instances, a new disk will be faulty, and will not initialize properly. If this happens, you will get the *Initialization failed* dialog box shown in Figure 2.14.
When you click OK, the faulty disk will eject. Sometimes, if you try a second time, the disk will initialize. If it doesn't, you should return your faulty disk and get another. Most disks are guaranteed to initialize.

**FORMATTING HIGH-DENSITY FLOPPY DISKS**

You format high-density floppy disks the same way you format 800K disks. The only difference is that the SuperDrive assumes you want to format your high-density disk for 1.4MB, and just asks to initialize it (Figure 2.15). Since it's a new disk, click Initialize and then follow the rest of the steps from Guided Activity 2.2.

**NOTE** Never put your HD disk into a double-density drive. You could accidentally erase its data.

**LABELING DISKS**

Special gummed *disk labels* are often sold with floppy disks. The plastic disk case is indented front and back to show where to place the label. Never place a label over the disk shutter. It is not necessary to use a special disk label; any gummed label smaller than the disk label outline will do. Address labels cut in half are very satisfactory.

Try to write on the label *before* you adhere it, or write lightly so that pen pressure doesn’t damage the mylar disk inside.

If you need to replace a label, remove as much of the old label as possible before adhering the new one. Otherwise, you can get several layers of label on top of each other; this overly thick disk can get stuck in the drive, requiring an expensive repair. Avoid labels with poor adhesive for the same reason.¹

**PREPARING OTHER STORAGE MEDIA**

All storage media must be initialized before use, including hard disks. Most hard disks sold today come preformatted from the factory. *Never* initialize a hard disk, unless you have been directed to do so by a service technician. As is the case with floppy disks, the initialization of a hard disk will erase all its stored files.

---

¹ One of our editors recommends the use of removable labels. We have never used them, but they sound like a good idea—as long as the labels stick until removed.
Floppy Disk Care

Now that you have initialized your floppy disk, you want to take good care of it so that it will store your files. Table 2.2 shows some rules to follow.

<table>
<thead>
<tr>
<th>DISK CARE RULES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Keep your disks away from heat, sunlight, and magnetic fields.</td>
</tr>
<tr>
<td>• Throw away the little plastic bag that may have come with the disk. Plastic can build up static electricity which can attract dust and contaminate your data.</td>
</tr>
<tr>
<td>• Transport your disks in a case; a folded Number 10 envelope works well.</td>
</tr>
<tr>
<td>• Use one and only one label. Be sure it sticks tightly on both sides and doesn’t obstruct the shutter or lock/unlock tab.</td>
</tr>
<tr>
<td>• Don’t open the protective shutter; it keeps dust, smoke, and dirt from damaging the media.</td>
</tr>
<tr>
<td>• Don’t put heavy objects on top of the disk, or write heavily on an applied label.</td>
</tr>
</tbody>
</table>

Managing Floppy Disks

Each disk drive holds only one floppy disk at a time. As your computer usage grows, you will fill many floppy disks with files. When you want to retrieve a file from a particular disk, you place the disk into the disk drive and instruct the computer to open or read the file. If the disk drive already contains another disk, you must remove or eject the first disk to make room for the new one. Let us examine this process in more detail.

When a disk becomes accessible for a computer work session, it is said to be mounted. When the Macintosh mounts a disk, the disk icon appears on the Desktop. You have already mounted disks. Every time you start up your Macintosh, it mounts the startup disk (containing the system software) and displays the startup disk icon in the upper right side of the Desktop screen. Typically, your startup disk is a hard disk. The shape of the icon will tell you if it is a hard disk or a floppy disk.

Figure 2.16 shows one mounted disk, the startup disk, Hard Disk.

When you mount a disk, the disk drive places a list of all the files stored on that disk into RAM. A file’s icon must appear on screen before you can open and use that file. When you open a disk icon, what you see inside its window is actually its table of contents, or its directory.

If your screen looked like Figure 2.16, your computer could only read (open) files on the startup disk. To read files on a floppy disk, the computer must first mount it. To mount the disk, you would place it into the disk drive, and wait for its icon to appear. When its icon appears, the disk is mounted. (You already did this in Guided Activity 2.1).

When you finish using a floppy disk, you should dismount it, or remove its icon from your Desktop and its directory from RAM. Dismounting also physically
removes the floppy disk from the disk drive. Dragging the disk icon through the Trash, as you did in Guided Activity 2.1, dismounts it.

Sometimes you need to eject a floppy disk temporarily to make room for another disk, but you know that you will use the original disk again in your current computing session. In this case, it is faster to eject the original disk without dismounting its icon from the Desktop. When you reinsert the original disk, it will remount quickly because its directory remains in RAM. This process is called ejecting without dismounting.

To eject a disk without dismounting, select its icon and choose Special/Eject. The disk will pop out, but its dimmed (inactive) icon remains on the Desktop waiting for you to reinsert the disk.

If you give the computer a command that requires the actual disk, such as opening it, the Macintosh will display a dialog box prompting you to reinsert the disk. You won't be able to do anything else until you either comply or type ~O to abort the command.

When you open the disk icon's window, the icon turns gray and becomes a shadow of itself.
If you Special/Eject a disk that has one or more open windows, as in Figure 2.17, all the file icons in the window(s) dim, to let you know they are not available (see Figure 2.17). The window(s) remain on the Desktop, however, because the disk is still mounted. When you reinsert the disk, the icons return to full brightness and become usable again.

When you dismount a disk by dragging it through the Trash, both its icon and its open windows disappear from the Desktop because their disk is no longer mounted. When you reinsert the disk, however, the open windows reappear as you last left them.

**NOTE** Multiple open windows clutter your Desktop. It's a good practice to close any open windows before dismounting.

**GUIDED ACTIVITY 2.3**

More Disk Manipulation

In this Guided Activity, you will insert the disk you used in Guided Activity 2.1 and eject it without dismounting. You will then attempt to open its icon, see the dialog box, and reinsert the disk.

**NOTE** All the illustrations in Guided Activity 2.3 use a floppy disk named West Student Data Disk. Since you are probably using a different disk, its name will appear on your screen in place of “West Student Data Disk.” Do not use your newly formatted Data Disk for this guided activity; it contains no files.

1. Insert the floppy disk and wait while it mounts. It should already be selected.

2. Choose Special/Eject Disk. Your disk will pop out, but its dimmed icon will remain on the Desktop.

3. Click the Desktop workspace to deselect the icon and note its appearance.

4. Select and File/Open the disk icon. You will get the insert disk box shown in Figure 2.18. This box alerts you that the Macintosh needs the actual disk inserted to open the disk’s window.
5. Reinsert the disk. The box will disappear since the reinserted disk is now remounted and ready to use.

6. Drag the disk’s icon through the Trash to dismount its icon and eject the disk.

**Automatic Disk Ejection**

The Special/Shut Down command that you use to end a computing session automatically dismounts and ejects any mounted floppy disks. This process removes the disk’s directory from RAM so that the computer will not look for the floppy disk the next time you start the computer. Special/Restart works the same way. Therefore, you do not need to eject disk(s) before shutting down or restarting the computer. The only thing you need to remember is not to leave your disk in a laboratory or other shared computer setting!

---

**Backing Up**

Preservation of your stored files is critical. Each double-sided floppy disk can hold the equivalent of 200 typed, double-spaced pages of text—which represents many, many hours of work. Although the Macintosh is generally reliable, hardware and software do fail. When they do, they can damage or lose your work. One of the most important things you can do to prevent these potential problems is to make regular copies of your disks. A *backup* is an archival copy, an exact replica of the original. You can back up an individual file, the contents of an entire floppy disk, or even the contents of an entire hard disk.

Backups are like insurance; they protect you against loss of data. If you have only one copy of something, and something happens to it, you lose it. A catastrophe such as a fire, a flood, or a theft means you lose not only your hardware, but also your files stored on that hardware. When you copy important files and take those copies to a different location, you are less likely to lose both sets of files simultaneously. Even if you don’t back up everything, be sure to back up your original, irreplaceable work. Without a backup, you would have to do the work over again to recreate the files.

As your computing experience grows, you will learn different backup techniques. Right now, your task is to copy all the files on the West Student Data Disk to another working floppy.

---

**GUIDED ACTIVITY 2.4**

**Copying the West Student Data Disk**

Guided Activity 2.4 shows you how to use the hard disk as an intermediary to copy the West Student Data Disk files onto the disk you named and initialized in Guided Activity 2.2. You will practice using the Trash. Begin at the Desktop with all windows closed and no floppy disks in the disk drive(s). Your instructor has a copy of the West Student Data Disk. You will either copy that disk, or in some cases...
your instructor will place the West Student Data files on your hard disk. If the files are already on your hard disk, you should only do steps 8–11 of Guided Activity 2.4.

**NOTE** If your hard disk has data security software that prevents it from being changed, you will not be able to follow the instructions from step 4 on. Read those instructions, however, and then use the alternate instructions at the end of the Guided Activity, if necessary.

1. Check that the West Student Data Disk is locked. The West Student Data Disk is your **source disk**; it contains the files you wish to replicate. Disk drives can read from locked disks, but cannot write to them. When copying from floppy to floppy, always lock your source disk so that you don’t accidentally erase your source files.

2. Check that your Data Disk is unlocked. The Data Disk is your **target disk**; it will receive the backup files. Disks must be unlocked to have files written to them.

3. Insert the West Student Data Disk.

   If your Hard Disk is unlocked:

4. Drag the icon of the West Student Data Disk onto the Hard Disk icon, as shown in the figure below. Only the disk icon will move. You are in the right spot when the Hard Disk icon highlights.

5. Release the mouse button and wait while all the West Student Data Disk files replicate into a folder on the Hard Disk. The Macintosh will display a dialog box to let you monitor the copy progress, as shown in Figure 2.19. Item by item, it reads files from the West Student Data Disk into RAM and then writes them onto the Hard Disk.

   ![Figure 2.19: Writing to the Hard Disk](image)

   The dialog box will disappear once the files are copied.

6. Open the Hard Disk and locate the West Student Data Disk folder shown in Figure 2.20. This folder contains your student files, backed up onto the Hard Disk.
7. Eject the West Student Data Disk (drag it through the Trash).

8. Insert the blank Data Disk.

9. Drag the icon of the West Student Data Disk folder onto the icon of the closed Data Disk. When you release the mouse button, the folder and all its contents will copy onto the Data Disk.

10. Open the Data Disk. The West Student Data Disk folder will appear in its window.

11. Close and eject the Data Disk.

12. Trash the West Student Data Disk folder from the Hard Disk. The Hard Disk was only an intermediary. Use the Trash to remove the West Student Data Disk folder from the Hard Disk.

   a. Drag the icon of the West Student Data Disk folder onto the Desktop workspace, the patterned area outside of any windows, as in Figure 2.21.

   b. Close the Hard Disk window.

   c. Drag the icon of the West Student Data Disk folder onto the Trash icon. When you release the mouse button, the West Student Data Disk folder will move into the Trash, and the Trash icon will bulge to show it has contents.

   d. Choose Special/Empty Trash to remove the West Student Data Disk folder from the Hard Disk. Emptying the Trash permanently erases its contents from storage, so the Macintosh gives you a last chance to cancel; the dialog box is shown in Figure 2.22.

   e. Click OK. The Trash will empty, and its sides will no longer bulge.

   f. Open the Hard Disk icon to see that the West Student Data Disk folder is really gone.
The Trash contains 5 items, which use 207K of disk space. Are you sure you want to permanently remove these items?

Cancel  OK

NOTE The instructions in step 12 a–f are attenuated to help you understand the file deletion process. In the future, to delete a file or folder you can simply drag its icon directly into the Trash and Empty the Trash.

13. Insert and open your Data Disk to ensure that it still contains the West Student Data Disk folder.

14. Close all open windows.

15. Choose Special/Shut Down to pop out your Data Disk and to end this computing session. Turn off components if necessary.

ALTERNATIVE BACKUP DIRECTIONS

If your Hard Disk is locked, and you have one floppy drive:

4. Choose Special/Eject to eject the West Student Data Disk, leaving the ghost of its icon on the Desktop.

5. Insert your Data Disk.

6. Drag the icon of the (locked) West Student Data Disk onto the icon of the Data Disk, as shown below, and release the mouse button.

A dialog box like the one in Figure 2.23 will appear.

7. Click OK and wait while the computer reads the files from the West Student Data Disk into RAM and then writes them to your Data Disk. Occasionally, the Macintosh will eject one floppy disk from the disk drive and ask for the other (as in Figure 2.18).

8. Keep inserting disks when asked for until the “floppy disk shuffle” ends. (It seems to go on forever.)

9. Open your Data Disk to see its files.
10. Close all open windows.

11. Choose Special/Shut Down to pop out your data Data Disk and end this computing session. Turn off components if necessary.

**Computer Measurement**

Some of the first questions that new computer users ask about disks concern their capacity. How large are the different disks? How large is a file? How many files will fit on a disk? When will I run out of space? To answer these questions, it is first necessary to understand computer measurement.

**The Computer's Binary Numbering System**

A numbering system is a way of representing numbers. Most people use the ten-digit decimal numbering system (0 1 2 3 4 5 6 7 8 9) to count, to measure, and to perform arithmetic operations. Building a computer with ten distinct kinds of electronic circuits would have been very difficult and expensive. It was much more precise and economical to build computers from simple circuits that have only two states: on and off. All personal computers today use this simple circuitry.

The two-digit numbering system that the computer uses to count, to measure, and to perform arithmetic operations is called the binary numbering system. Binary, also called Base 2, only uses two digits, one and zero, because each circuit is either on (1) or off (0).

The smallest binary unit is a bit, or Binary digit. Each bit represents a single on-off circuit. All the text, pictures, sounds, and other elements that the computer manipulates can be reduced ultimately to sequences and combinations of bits. It’s hard to believe!

Different eight-bit combinations, called bytes, represent each letter of the alphabet, decimal digit, or other characters you enter from your Macintosh keyboard. The binary representation of the capital letter “A” is the byte 0 1 0 0 0 0 0 1.

Computers process millions of bytes of information in a second, and store millions of bytes of information. Therefore, you will often see two other computer measurements: kilobyte and megabyte. A kilobyte is approximately 1,000 bytes, but actually 1,024 bytes or 8,192 bits. A megabyte is approximately 1,000,000 bytes,
actually 1,024 kilobytes, 1,048,576 bytes or 8,386,608 bits. Kilobytes are abbreviated as \( K \); megabytes are called Megs but are abbreviated as MB. The storage capacity of large storage devices is measured in gigabytes. Each gigabyte is a billion bytes, called Gigs and abbreviated as GB.

The sizes of individual files and the capacity of storage media are usually measured in Ks and MBs. It takes roughly 2,000 bytes, or 2K, to store the equivalent of a double spaced 8.5 \( \times \) 11-inch typed page. Graphic files require more storage space than plain text. Therefore, a complex one-page document that combines both text and graphics could fill several hundred Ks of storage.

**The Storage Capacity of a Floppy Disk**

Each disk window has an information bar that provides some storage statistics. To determine a disk's storage capacity, open its window and examine its information bar.

![Figure 2.24](image)

Each information bar tells you three things. First, it tells you how many items there are in the open window. An icon represents each item. The disk shown in Figure 2.24 has twelve items (icons) although only four are visible. Second, the information bar shows how many kilobytes are already occupied, or in disk. Third, it shows you how many kilobytes are free, or available.

When full, an 800K disk, such as West Student Data Disk, is capable of holding about 200 pages of information. The disk shown in Figure 2.24 is not full; it holds 418K of information, with 344K available to store more files. Actually, an 800K disk can only store up to 779K of files; the remaining kilobytes are used by the disk's invisible directory.

**Hard Disk Capacity**

Hard disks are much larger than floppy disks. A 20 megabyte hard disk holds the equivalent of 5,000 pages of information, a 40MB hard drive, 10,000 pages. Reflecting this greater size, the hard disk information bar will often display MB rather than K, as in Figure 2.25.

**Measuring the Size of Individual Files**

You will often want to know the size of an individual file to determine if the file will fit on a particular disk, or how much storage space will become free if you
remove it. The File/Get Info command displays an information box like the one shown in Figure 2.26 that tells you, among other things, the file’s size.

**GUIDED ACTIVITY 2.5**

*Measuring a Disk and a File*

In Guided Activity 2.5, you will use the information bar to determine how much of your Data Disk is filled, and how much is available. Then you will choose File/Get Info to find out the size of the Congratulations file. Begin with your computer started up and your Data Disk inserted.

1. Choose File/Open to display its window.
2. Examine the information bar. How many K are in disk? How many K are available?
3. Click the Congratulations file icon.
4. Choose File/Get Info to display the file’s information box (Figure 2.27).

**NOTE** There appears to be a discrepancy between the number of bytes and the number of kilobytes. Don’t forget there are 1,024 bytes in a kilobyte, not 1,000. Actually, 103,664 divided by 1,024 equals 101.23K, but kilobyte measurements are always rounded up to the next K. (It’s better to have slightly more room than you need than slightly less.)
Summary

The computing process has five components: processing, input, output, memory, and storage. Electronic memory, or RAM, holds the computer’s instructions, data, and information for rapid processing. Magnetic storage permits you to save your work from one computing session to another. The most common Macintosh storage medium is the disk, and can be either a hard disk or a floppy disk. There are three different sizes of Macintosh floppy disk—single-sided, double-sided, and high-density. Your system’s disk drive(s) determine which disk(s) you can use. Each new disk must be initialized, or formatted, before it can be used. Once you initialize a disk, be sure to observe the rules for disk care.

Disks are organized into files: discrete, named collections of instructions, data, or information. Available disks are said to be mounted, and the Macintosh displays their disk icons on the Desktop. Disks and files are measured using the computer’s binary numbering system of bits, bytes, kilobytes, and megabytes. You can measure the size of files and disks with File/Get Info.

Just because a file is stored doesn’t mean it will last forever. Disks fail. Backups are duplicates of original files. The most important files to back up are your original work. Create backups and keep them in different locations from your originals.

Command Review

You should now know these Macintosh commands:

- **Insert**: Place a floppy disk into the disk drive and wait while it mounts.
- **Eject**: Drag a floppy disk icon through the Trash and wait while it dismounts.
- **Initialize**: Insert a new floppy disk and follow steps to prepare it to receive Macintosh files.
- **Trash**: Permanently delete files from storage. Drag items to delete into the Trash and choose Special/Empty Trash.
- **Abort**: Press Command Period (~). Stops the command that the computer is currently executing, or trying to execute. *Note:* It does not always work.

Exercises

The following exercises review your understanding of the computing process, the computer numbering system, floppy disk care, and backing up.

A kilobyte is roughly a thousand bytes, a megabyte is a thousand kilobytes, a gigabyte is a thousand megabytes.
1. Convert these measurements from bytes to kilobytes.
   Divide each number by 1,024. Label each numeric answer with the letter K.
   a. 2,048 bytes = __
   b. 8,192 bytes = __

2. Convert these measurements from megabytes to kilobytes.
   Multiply each number by 1,024. Label each numeric answer with the letter K.
   a. 2MB = __
   b. 8MB = __

3. Convert these measurements from kilobytes to megabytes.
   Divide by 1,024. Label each numeric answer with the letters MB.
   a. 2,048K = __
   b. 8,192K = __

4. Convert these measurements from megabytes to kilobytes.
   Multiply by 1,024. Label each numeric answer with the letter K.
   a. 4MB = __
   b. 20MB = __

Review Questions

The answers to odd-numbered questions are contained in Appendix A.

Multiple Choice

1. When you enter data into the computer, you
   a. input
   b. output
   c. process
   d. interact

2. Interactive computing depends on
   a. feedback from the user
   b. hardware
   c. software
   d. all of these
3. RAM represents
   a. memory
   b. storage
   c. reading
   d. writing

4. Backups are important because
   a. they guard against losing important data
   b. they take up more storage space
   c. they help to ensure against the need to recreate your work
   d. a. and c.

5. Which of the following should not be placed into a double-sided disk drive?
   a. an 800K disk
   b. a 400K disk
   c. a 1.4MB disk
   d. an uninitialized 800K disk

**True or False**

1. ___ The computer’s main task is to convert raw data into information.
2. ___ Memory and storage are added to the computing process to make the computer more functional.
3. ___ The initialization process places tracks, sectors, and the invisible Desktop file on the disk.
4. ___ The backup copy of a file should be stored on the same disk as the original so that it is easy to find.
5. ___ Special/Eject dismounts a disk.
**Fill In the Blanks**

1. Identify these system components and their functions:

<table>
<thead>
<tr>
<th>Component</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
</tr>
<tr>
<td>b.</td>
<td></td>
</tr>
<tr>
<td>c.</td>
<td></td>
</tr>
<tr>
<td>d.</td>
<td></td>
</tr>
<tr>
<td>e.</td>
<td></td>
</tr>
<tr>
<td>f.</td>
<td></td>
</tr>
</tbody>
</table>

2. Identify your computer system’s components.

   **Input devices**
   - 
   - 
   - 

   **Output devices**
   - 
   - 

3. The information bar, located in a window, displays storage statistics. List the three things this bar tells you (in icon view).

   a. 
   b. 
   c. 

4. What does a bulging Trash icon indicate?

5. The most common Macintosh storage medium is the _____________________.
Key Terms

The following terms are introduced in this unit. Be sure you know what each of them means.

400K disk  Formatting  Nanosecond
400K drive  GB  Numbering system
800K disk  Ghost  Output
800K drive  Gig  Printer
Available  Gigabyte  Printout
Backup  Hard copy  Processing
Base 2  Hard disk  RAM
Binary numbering system  HD disk  Random access memory
Bit  High-density  Read
Bytes  I/O  Retrieval
Central processing unit  In disk  Save
CPU  Information  Sector
Data  Information bar  SIMM
Decimal numbering system  Initialization  Single-sided disk
system  Initialization failed  Single-sided drive
Dialog box  dialog box  Source disk
Dialog box  Initialize  SS/DD
Digit  Input  Storage
Directory  Input/output  Storage device
Disk  Insert  Storage medium
Disk drive  Interactive computing  Store
Disk icon  Item  SuperDrive
Disk label  Interactive computing  Target disk
Disk label  Item  Track
Dismount  K  Trash
Double-sided disk  Kilobyte  Unlock
Double-sided drive  Label  Verify
DS/DD  Lock  West Data Disk
Eject  Lock-unlock tab  Write
Ejecting without  MB  Write-protection tab
dismounting  Meg  
Feedback  Memory  
File  Mounted  
Floppy disk  

A word processing application processes words: it transforms your computer system into a word processor, a sophisticated text creation and text manipulation tool that is vastly superior to an ordinary typewriter. The word processor provides a screen preview of what will be printed. As you type, the text appears on your screen. You may correct mistakes and improve the appearance of your screen document before the words are printed.

Word processing eliminates the need to scribble ideas on rough drafts and retype the final version. As you think and edit, you take steps to improve the presentation of your document on screen. Only when you are pleased with your on-screen work do you print it.

Unit 3 introduces you to text manipulation—the basis of word processing. You will use Microsoft Word, a popular Macintosh word processing application. First, you will enter characters and words with the keyboard. Then, you will save your text and experiment with text selection, insertion, alteration, and deletion. Finally, you will save the changed file to your data disk and print the finished product.

---

**Learning Objectives**

At the completion of this unit you should know

1. the function of various keys on the Macintosh keyboard,

2. the principles of text selection:
   a. the purpose of the insertion point,
   b. the relationship between the I-beam (pointer), the insertion point, and the text block,
3. the function and purpose of word wrap,
4. some of the advantages of word processing over typing.

At the completion of this unit you should be able to
1. identify and use the Macintosh keyboard,
2. use the mouse and arrow keys (keyboard) to reposition the insertion point,
3. use the MS Word application:
   a. open MS Word documents,
   b. enter text,
   c. select and deselect text,
   d. edit text: delete and replace,
   e. display and hide nonprinting characters,
   f. join and separate paragraphs,
   g. save and print MS Word documents,
   h. quit the MS Word application.

---

**The Keyboard Inputs Text**

Text consists of the words, numbers, and other symbols that make up letters, papers, reports, and other written documents. The smallest unit of text is the individual character, a single letter, number, punctuation mark, or other symbol that appears on the printed page.

You input text into the computer with the keyboard, which resembles a conventional typewriter. Unlike a typewriter, however, when you press a key, a character appears on screen rather than on paper. This process of sequential key pressing is called entering text. The capabilities that distinguish the word processor from the typewriter require the Macintosh keyboard to have some extra keys and to use some familiar keys in nontraditional ways. For example, the Return key, Caps Lock, and many letter keys can be used in conjunction with modifier keys, like ⌘, Option, Shift.

**Standard and Extended Keyboards**

Apple Computer, Inc. makes two basic Macintosh keyboards, standard and extended. Figure 3.1 shows the extended keyboard. Its key layout resembles those used by most other personal computers.
The Macintosh Keys

There are many regular and special keys on a Macintosh keyboard. Use either Figure 3.1 or Figure 3.2 to locate each key or group of keys on your own keyboard. Then refer to Table 3.1 to help learn how they work.

Some of the keys are toggle keys; their role alternates either on or off each time it is pressed such as the [Caps Lock] in Table 3.1. Others are repeat keys; as long as they are pressed, the computer will repeatedly type their character, or move in the indicated direction.

MS Word

One of the most widely used word processing software for the Macintosh is Microsoft Word, abbreviated MS Word in this text. MS Word is popular because it is relatively easy for beginners to learn, but contains many advanced features for professional writers and typesetters. Its built-in dictionary and grammar checker help you to locate and fix mistakes. Its thesaurus aids in finding just that right word. Its graphics tool allows you to enhance the appearance of your finished
<table>
<thead>
<tr>
<th>TABLE 3.1</th>
<th>KEYS AND THEIR ROLES</th>
<th>CHARACTERISTICS</th>
</tr>
</thead>
</table>
| **Alphanumeric keys** | **QWERTY** | - Produce letters, numbers, punctuation, and other characters  
- Arranged like on an ordinary typewriter (QWERTY)  
- Repeat automatically when pressed |
| **Shift key** | **Shift** | - Works in combination with other keys, produces uppercase letters,  
or the upper character on the key |
| **Delete or backspace** | **Delete** | - Deletes character(s) to left of insertion point (joins text blocks)  
- Deletes selected text block  
- Repeats automatically when pressed |
| **Return key** | **Return** | - Moves the cursor to the beginning of the next line (separates text blocks)  
- Can also execute commands  
- Repeats automatically when pressed |
| **Tab key** | **Tab** | - Automatically moves the cursor to the right to the next stopping place, usually to the 1 inch and \( \frac{1}{2} \)-inch mark  
- Repeats automatically when pressed |
| **Modifier keys** | | - Typically have no action of their own; used with other keys |
| **Command (⌘) key** | **⌘** | - Combines with other keys to command the computer |
| **Option key** | **Option** | - Produces special characters when it is combined with alphanumeric keys; can also modify other actions |
| **Control key** | **Control** | - Supplements the command and option keys  
not found on older (Mac Plus) keyboards |
| **Caps lock** | **Caps Lock** | - Locks shift key to uppercase for letters only  
- Active when pressed  
- On the extended keyboard, green indicator light indicates when it is active  
- Works as a toggle key |
| **Enter key** | **Enter** | - Used with numeric keypad.  
- Often works the same as the return key |
| **Arrow keys** | | - Used in lieu of the mouse to move the position of the insertion point  
- May have other roles in specific applications  
- Repeats automatically when pressed |
| **Numeric keypad** | **Num Lock** | - Produce numbers and mathematical symbols (+ - * / =)  
- In some programs, the numeric keypad can be used to command the computer. The **Num Lock** key toggles between numeric and command mode  
- Repeat automatically when pressed |
work. MS Word can automatically number, date, and time stamp pages, alphabetize
a list of names, and create outlines, charts, tables, columns, and other text formats.
You will learn only a few of MS Word’s many features from this introductory book.

NOTE MS Word has been in existence nearly since the beginning of Macintosh computing, and
has been revised several times. The version supported in this text is version MS Word 5.1.

The MS Word Screen

MS Word’s screen can be overwhelming the first time you see it. The little
boxes are buttons, easy on-screen ways to give commands. In the next Guided
Activity you will refer back and forth between Figure 3.3 and your own computer
to learn to recognize the major MS Word on-screen landmarks.
GUIDED ACTIVITY 3.1

Opening MS Word and Entering Text

In Guided Activity 3.1 you will open the MS Word application and locate important on-screen landmarks. Then you will input a well-known quote into the untitled document window. Begin at the Desktop.

1. Locate the MS Word application icon. Since each system is different, your instructor may need to assist you. If you feel adventurous, try the Macintosh’s Find feature described at the end of Unit 14 to locate the MS Word application.

2. Open the MS Word application icon. Either click the MS Word application icon and choose File/Open or simply double-click on the MS Word application icon. Application icons open like disk icons to reveal a document window in which to work. The document window should resemble the one shown in Figure 3.3.

3. Locate some screen landmarks.
   a. The Menu bar at the top of the screen. Notice that some of its titles differ from the Finder menu bar.
   b. The Toolbar just under the Menu bar. These tools can be used in place of pull-down menus to execute commonly used commands.
   c. The Ribbon, which helps to format text and to show format settings.
   d. The Ruler, which is similar to the Ribbon.
   e. The insertion point. It is the blinking vertical line that indicates where the text you type will appear on screen.
   f. The end of file mark, below the insertion point. It is a dark horizontal line that indicates the end of your document.
   g. The document name in the title bar of the document window. All documents areUntitled until named and saved.

4. Enter the text in Figure 3.4.

FIGURE 3.4
Text for Guided Activity 3.1

The computer is by all odds the most extraordinary of the technological clothing ever devised by man, since it is an extension of our central nervous system. Beside it the wheel is a mere hula hoop.

Marshall McLuhan
a. To enter text, just start typing. The characters will appear on screen as you type them. (Your text will probably look different from Figure 3.4.)

b. Do not press the Return key when you come to the end of the line—the Mac will do it for you. This automatic feature is called word wrap. You will learn more about word wrap at the end of this unit.

c. Press the Return key only at the end of the first paragraph, where the ¶ appears in Figure 3.4 but not necessarily on your screen. Your lines may end at different places than Figure 3.4 as your system may use different type or margins, but that’s OK.

5. Locate the insertion point at the end of the last character you typed. It shows your place in the document.

---

**Saving Files to Disk**

As you type, signals go from the keyboard keys into the computer, specifically into RAM. With the text in RAM, you can use the MS Word application to edit or otherwise modify the text, but when you quit MS Word, all your work will vanish unless you save your work onto a disk. That’s how you preserve it from one computing session to another.

---

**GUIDED ACTIVITY 3.2**

**Saving Your Work**

Guided Activity 3.2 continues from Guided Activity 3.1. Here you will name your document First Try and store it on your Data Disk. After you have saved your work, you will quit MS Word and return to the Desktop. You can retrieve and correct this document later.

**NOTE** Do not insert your Data Disk until instructed, or you may have problems with this Guided Activity.

1. Choose File/Save As. The MS Word Save As dialog box will appear.

2. Insert your floppy disk. The Save As dialog box should resemble Figure 3.5.

3. Locate these landmarks in the Save As dialog box:

   a. The active disk, the name of the disk where the file will be saved currently.

**NOTE** If your screen does not show your disk's name here, the saved file will be placed somewhere other than on your disk. You may have this problem if you inserted your Data Disk before you chose File/Save As.
i. As a remedy, click the Desktop button to see the choice of all mounted disks. The Save button will change to an Open button allowing you to select among the mounted disks.

ii. Click the name of your disk in the scrollable list of disk contents, shown in Figure 3.5.

iii. Click the Open button to activate your disk. Its name should appear both in the active disk position and at the top of the data contents window. Now the file will be saved on your disk.

b. The **scrollable list of disk contents**, displaying the contents of the active disk or its open folder.

c. The **Document Name text entry box**, where the file name you type will appear.

d. The various command buttons.

    *Desktop* displays the disks available for saving and any folders or documents on the Desktop.

    *Open* lets you display the contents of the active disk or folder.

    *Eject* removes the active floppy disk so that you may insert another. (It leaves the ghost of the floppy disk on the Desktop.)

    *Cancel* lets you close the dialog box without saving the file.

    *Save* allows you to save the file.

The Save button will be gray (inactive) until the file is named.

The Save button and the Open button occupy the same position. The button displayed represents your command choice at that moment.

The New Folder button will not be covered.
3. Follow these steps to save your work:
   a. Click in the box directly beneath “Save Current Document as:” to set an insertion point.
   b. Type the file name: First Try.
   c. Click Save to save your updated document to your Data Disk.
   d. Wait while the file is written to your disk.

4. Print the First Try document.
   a. Choose File/Print to display the Print dialog box, Figure 3.6. The Print dialog box lets you choose among several printing options. Print dialog boxes vary, and depend on the printer and the printing software you use. Your dialog box may look quite a bit different from the one shown in Figure 3.6.

   ![Print dialog box for Personal LaserWriter NTR](image)

   FIGURE 3.6
   The Print dialog box for Personal LaserWriter NTR

   Displays type and name of chosen printer
   This button may say OK instead of Print

   Copies: 1  Pages: @ All  © From:  To:  Print
   Cover Page:  © No © First Page © Last Page
   Paper Source: © Paper Cassette © Manual Feed
   Print: © Black & White © Color/Grayscale
   Destination: © Printer © PostScript® File

   Printing options:
   printer and application specific

   NOTE Some laboratories require that you set your printer destination before you can print. If directed by your instructor, skip ahead to Unit 4 and read the section on the Chooser to learn how to select a printer.

   b. Click on Print to print your document. Some Print dialog boxes have an OK button instead of a Print button. Both buttons do the same thing. Some printers begin printing immediately. Others, especially laser printers, take a minute or two to set up the document before they actually print.

   5. Choose File/Quit to clear Word 5.1 and First Try from RAM and return to the Desktop.

   6. Open your Data Disk. The First Try document icon will appear in its window.

   7. Close the Data Disk window and eject the Data Disk (drag its icon through the Trash).
The great advantage of word processing over manual typing is your ability to manipulate text after it has been entered and saved. To make any changes to your document, you must identify the exact location to add characters, or the precise character, word, or sentence that you wish to modify or delete. Like all other processes on the Macintosh, text selection precedes text modification. Remember the basic tenet of Macintosh computing: select first, then act.

The Insertion Point

You have already seen the insertion point, the blinking vertical line that specifies where text is to be inserted or deleted. The insertion point identifies the place in your document where the next character you enter will appear. Each document can have only one insertion point.

Figure 3.7 shows the window of Congratulations, the MS Word document you will use later in this unit. Notice the insertion point at the very beginning of the document, just before the letter C.

The I-Beam

The mouse can change the location of the insertion point. You have already seen the mouse pointer change shape when it changes function. Whenever its function is text-oriented, the mouse displays an I-beam pointer that resembles the capital letter "I." To relocate the insertion point, you simply move the I-beam pointer to its new location and click.
GUIDED ACTIVITY 3.3

Locating and Moving the Insertion Point

The West Student Data Disk folder on your Data Disk contains many files that save you typing time. In Guided Activity 3.3 you will open the Congratulations document, locate the insertion point, and move it. Begin at the Desktop, with your Data Disk inserted.

1. Open the West Student Data Disk folder.
2. Locate the Congratulations document icon.
3. Open the Congratulations document icon to load both MS Word and the Congratulations document into RAM. Your window should resemble Figure 3.7.
4. Locate the blinking insertion point at the beginning of the document before the letter C.
5. Locate the I-beam pointer. If you can’t find it, roll the mouse slightly. The I-beam will move with the mouse.

**NOTE** The pointer must be inside the document window to display its I-beam. Otherwise, it will display as an arrow.

6. Move the I-beam directly to the left of the letter d in drafts in the second paragraph.

   Note that the insertion point has not moved from before C, Figure 3.8.

7. Click to reposition the insertion point. Roll the pointer out of the way to observe the new insertion point location as shown in Figure 3.9.

8. Leave the document open for the next Guided Activity.
Text Modification

Text can be modified in several ways. Additional characters can be inserted, characters can be deleted, or characters can be changed.

Text Insertion

When you insert text, whatever you type appears on your screen at the location of the insertion point. Try it.

GUIDED ACTIVITY 3.4
Inserting Text

Guided Activity 3.4 continues from Guided Activity 3.3. As you insert the words and even fifth between fourth and drafts, you will watch the existing text move apart to make room for the new phrase. Do not press the space bar to make room for the new text. The word processor will do this for you.

1. Be sure your insertion point is still to the left of the d in drafts. If not, move it there.
2. Type the characters and even fifth. Be sure to put a space after the h in fifth. Notice that the insertion point travels just to the right of the last inserted character as you continue to enter text. Your results should look like Figure 3.10.

Text Deletion

You will often enter characters or words that you wish to erase. This process is called text deletion. To delete text, set your insertion point just to the right of the character or word you wish to remove, and click the Delete key shown in Figure 3.11. (Older keyboards may call it the Backspace key.)

Like so many Macintosh keys, the Delete key is a repeat key. As long as it is pressed, it keeps deleting. (If you are not careful, you can erase more than you intended. Fortunately, text is not difficult to re-enter.)
Guided Activity 3.5 continues from Guided Activity 3.4. Here, you will relocate the insertion point and then use the \texttt{Delete} key to delete a phrase. Afterwards, you will retype the deleted text and then save your work.

1. Move the insertion point between the \textit{s} in \textit{drafts} and the period, as shown in Figure 3.12.

2. Click the \texttt{Delete} key once. The \textit{s} will disappear, and text to the right of the cursor will move over to fill its place.

3. Keep the \texttt{Delete} key pressed until \textit{second and third and fourth and even fifth drafts} is deleted, and then let go.

   Your second paragraph should look like Figure 3.13.

4. Be sure your insertion point is still to the right of the \textit{g} in \textit{retyping} in the second paragraph. If not, move it there.

5. Type the words \textit{second and third and fourth and even fifth drafts} to restore them to your document. Be sure to include a space before the \textit{s} in second.

6. Choose File/Save to save your changed file to your Data Disk. Use File/Save to update a file that you have already saved onto your disk. File/Save places the current version of the file on your disk and then removes the old version. It just takes a second or two, and you won’t need a dialog box.

\textbf{Note} You should choose File/Save often—about every fifteen minutes—as you work on longer documents. This way, you won’t lose all your work if the screen freezes or there is a power failure; you will only lose the part of your document entered since the last File/Save.
Take a Computer Break

There will be many times when you need to stop a computer lesson before completion.

To Stop a Session: Save your work, quit the application you are using, and Shut Down your computer, or follow other steps specific to your lab.

To Resume a Session: Turn on your computer and reach the Desktop. Insert your Data Disk. Open its window and the document you are working on. The document should appear on screen just the way you left it, except that the insertion point will be at the beginning of the document.

Text Blocks

If you have more than a few characters to delete or change, it is more efficient to select the range of text all at once and then take action. The selected range of characters is called a block of text, or a text block.

Selection and Deselection

A selected text block highlights on screen; the text either reverses (monochrome monitor) or changes color. (Figure 3.14 shows two examples of highlighted text.) Once selected, a text block may be deleted, replaced, formatted, copied, or moved. A text block can be as small as one character or as large as the entire document, but the selected characters must be contiguous.

A document can only have one selected text block, just as it can have only one insertion point. That text block takes the place of the insertion point; there is either a text block or an insertion point, but not both simultaneously.

SELECTING A TEXT BLOCK

To select a block of text, place the insertion point at the spot you wish to begin selection and drag to the end of your selection. Drag horizontally to select characters on the same line of text as in Figure 3.15; drag vertically to select adjacent lines of text.
DESELECTING A TEXT BLOCK

You might select the wrong block, or decide that you don’t want that block selected. You can deselect a text block by clicking the I-beam pointer anywhere within your document. The text block will deselect, and an insertion point will blink where you clicked.

PROBLEMS WITH BLOCK SELECTION

Beginners often have trouble selecting a precise text block because the mouse’s position and movement is so sensitive. When selecting characters on the same line, be sure to keep the mouse’s position horizontal as you drag to avoid selecting lines above or below your target. If you drag diagonally up, your selection might look like Figure 3.16.

If you drag diagonally down, your selection might look like Figure 3.17.

GUIDED ACTIVITY 3.6

Selecting and Deselecting Text Blocks

Guided Activity 3.6 continues from Guided Activity 3.5. Here, you will select and deselect text blocks.

1. Move your insertion point just to the right of the g in retyping.
2. Drag right to select the characters and fourth and even fifth.
3. Deselect the text block. Point the I-beam to the left of the R in Regrets and click. The block will deselect and your cursor will move to the left of the R, as in Figure 3.18.
4. Select the bottom five lines of the second paragraph, as in Figure 3.19.
   a. Begin with the I-beam positioned before the R in Regrets.
Regrets, typewriter. No more erasure holes, no more "whiteout," no more retyping second and third and fourth and even fifth drafts. You have just been replaced by a word processor, a software application program designed to make text easier to create, edit, format, and print.

b. Drag down until all five lines are selected. You will have to drag below the last line.

5. Deselect the text block. Click the I-beam anywhere within the document. The insertion point will move to the spot you clicked.

6. Choose File/Save and leave your document on screen for the next Guided Activity.

Text Block Manipulation

Once you have selected a text block, you can delete the entire block with one quick tap of the [Delete] key. Remember, the [Delete] key repeats.

You can also replace a block of text with another, rather than remove it. Simply select the undesired text block, and enter the new copy. It is not necessary to press the [Delete] key to replace a block of text; the text block is replaced automatically by the first character you type after selection.

GUIDED ACTIVITY 3.7
Manipulating Text Blocks

This Guided Activity continues from Guided Activity 3.6. Here, you will delete and replace text blocks, save your work, print your document, and quit MS Word.

1. Delete and fourth and even fifth.

   a. Select the text block and fourth and even fifth, beginning with the space before the first and.
b. Click the (Delete) key once. Notice that the paragraph realigns itself (wraps) to compensate for the missing text.

2. Replace the word STUDENT with your name.
   a. Select STUDENT (see Figure 3.20).

   
   **FIGURE 3.20**
   Select STUDENT

   Congratulations, STUDENT

   b. Press the (Caps Lock) key to lock it.
   c. Type your name. It will replace the word STUDENT.

3. Replace the word typewriter with TYPEWRITER.
   a. Select typewriter (Figure 3.21).

   
   **FIGURE 3.21**
   Select typewriter

   Regrets, TYPOWRITER

   b. Retype the word typewriter so it will change to all caps. Your final document should look like Figure 3.22.

   
   **FIGURE 3.22**
   Completed Guided Activity 3.7

   Congratulations, YOUR NAME. Together, you and your Mac are going to increase productivity in creating and manipulating text. You will save many hours of retyping, and improve the appearance of your finished work.

   Regrets, TYPEWRITER. No more erasure holes, no more “whiteout,” no more retyping second and third drafts. You have just been replaced by a word processor, a software application program designed to make text easier to create, edit, format, and print.

4. Press the (Caps Lock) key to release it. Remember, it toggles.

5. Save, Print, and Quit.

**Word Wrap**

Have you observed what happens when the cursor comes to the right margin on the screen? The cursor moves to the beginning of the next line. You should not press (Return) unless you are ending a paragraph. The computer automatically measures the length of the last word on each line. If a word does not fit on a line, the word processor moves the last word to the first position in the next sentence.
When you insert text, the rest of the line automatically moves over to the right to make room for the new characters; the line even wraps around to the beginning of the next line if it exceeds the right page margin. This process is known as word wrap. Word wrap permits text to realign automatically to the margins whenever you either add or delete text. What a useful tool!

For your document to wrap properly, you may need to unlearn some old habits left from using a typewriter. Before computers and word processors, a typewriter rang a bell when typing came close to the right side of the page, called the right margin. To continue typing on the next line, you had to push the carriage return or, on an electric typewriter, Return. On a computer, pushing (Return) to go to the next line creates a hard return or manual return.

Do not press (Return) at the end of every line; let the computer automatically bring the insertion point to the next line. These computer-generated returns are called soft returns.

There are two reasons to let the computer create its own returns. First, you can enter text quickly if you do not need to pay attention to the right margin of every line, and you can avoid worrying about whether or not the next word you type will be too long and will exceed the margin. Second, and more critical, the computer's soft returns allow it to automatically adjust line length as you insert or delete text or change the width of your paragraph. In Figure 3.22, the width of the first paragraph of the Congratulations document has been reduced from 6 inches to 4 inches. Each line automatically adjusted to compensate. Note that there is only one return at the end of the paragraph. In Figure 3.23, the return appears as a ¶, which represents a paragraph mark. The dots between the words show each time the space bar was typed.

Figure 3.24 demonstrates the effect of placing a hard return at the end of every line. When the line width was decreased from 6.5 inches to 4 inches, automatic word wrap was blocked by the hard returns. Observe the large white gaps along the right margin; wherever a hard return occurred, the computer moved the text to the next line.
The effect of hard returns at the end of each line, with paragraph marks and spaces displayed.

The Return Key

When should you use Return? Whenever you want to separate paragraphs. Return allows you to start a new paragraph when entering text or to divide one paragraph into two when editing text. If you press Return twice, it permits you to separate paragraphs with the first return, and to add a blank line with the second.

The Word Processing Paragraph

What is a paragraph? The word processing paragraph is not the same as the English language paragraph. In word processing, a paragraph is defined as the distance between Returns. For example, when you type your name and press Return, you have created a paragraph, designated by the paragraph symbol, ¶. Unit 8 examines the word processing paragraph in greater detail; here you will simply join and separate paragraphs.

GUIDED ACTIVITY 3.8

Dividing and Uniting Paragraphs

This Guided Activity uses the Congratulations file in your West Student Data Disk folder and concentrates on the appropriate use of the Return key to separate and rejoin paragraphs.

1. Open Congratulations. The insertion point will be at the beginning of the document.

2. Click the I-beam just in front of the T in Together (see Figure 3.25).

3. Press Return twice; once to divide the paragraphs and once to give an additional line of white space between the paragraphs (see Figure 3.26).
4. Modify steps 2 and 3 to divide and separate typewriter and No.

5. Modify steps 2 and 3 to place YOUR NAME into a separate paragraph (see Figure 3.27).

6. There is too much space between Congratulations, and YOUR NAME. Rejoin the paragraphs to place Congratulations, and YOUR NAME on the same line.
   a. Be sure the cursor is just to the left of the first character in YOUR NAME.
   b. Press [Delete] twice; once to remove the blank line and once to rejoin the paragraphs.

7. Eliminate the extra line of space between the first and second paragraph. Place the cursor to the left of the T in Together, and press [Delete] once.

8. Modify step 7 to eliminate the blank line between TYPEWRITER and No. Your final document should resemble Figure 3.28. If you use a different typeface, the lines may not wrap in exactly the same places.

9. Save, Print, and Quit.

Together, you and your Mac are going to increase productivity in creating and manipulating text. You will save many hours of retyping, and improve the appearance of your finished work.

Regrets, TYPEWRITER.

No more erasure holes, no more “whiteout,” no more retyping second and third drafts. You have just been replaced by a word processor, a software application program designed to make text easier to create, edit, format, and print.
Summary

Unit 3 guided you through the basics of text manipulation. You learned to change the position of the insertion point (cursor). You inserted and deleted text, selecting text blocks when appropriate. You used the [Caps Lock], [Return], [Shift], [Tab], and [Delete] keys. You separated and joined paragraphs, and observed the effects of word wrap. Finally, you saved and printed word processing documents.

Command Review

Select (text) Drag from the beginning of a selection to its end.
This command highlights a block of text.

Deselect (text) Click the I-beam within the document.
This command cancels highlighting on a selected text block and places an insertion point where you clicked the I-beam.

Replace Select a text block and type something else.
This command replaces the original with what you type next.

Save Choose File/Save.
This command will produce the Save As dialog box the first time a document is saved, and update changes after that.

Quit Choose File/Quit.
This command removes the application and its open document(s) from RAM and returns you to the Desktop.

Print Choose File/Print, then print or OK.
Displays the Print dialog box so that you can make a hard copy of a document.

Exercises

There are three Unit 3 practice files in the Exercise folder of the West Data Disk folder on your Data Disk. Each file allows you to edit text, separate paragraphs, and save and print the document.

To access a practice file, open the West Data Disk folder, then the Exercise folder, and then the file you need.

When you save each document, use its file name followed by the unit number. For example, the first file will be named Walrus U3. Be sure to give each file the correct name so that you can locate it for later exercises.
UNIT 3 TEXT MANIPULATION

1. The Walrus and the Carpenter
   a. Open the Walrus file.
   b. Save as Walrus U3 on your Data Disk. (Guided Activity 3.6 reviews the steps.)
   c. Make the following changes to the text:
      i. Capitalize the first letter of every line in the passage.
      ii. Divide the passage into two stanzas after the word row in line 6.
      iii. Create a blank line between the two paragraphs.
   d. A line of the poem is missing. Insert the line To talk of many things:' after the first line of the second paragraph. The poem is still not correct! Somebody went through it and changed seven of the original words to homonyms. These words sound the same, but mean something different, for example: whale—wail, to—too—two.
   e. Change these words:
      | Original   | Change |
      |------------|--------|
      | sew        | so     |
      | wrested    | rested |
      | weighted   | waited |
      | thyme      | time   |
      | ceiling    | sealing|
      | see        | sea    |
      | weather    | whether|
   f. Proofread your work and make any needed corrections.
   g. Choose File/Save to update your changes.
   h. Print your work.
   i. Quit MS Word.

2. Quotes from Shakespeare
   a. Open the Shakespeare file.
   b. Save as Shakespeare U3.
   c. Make the following changes to the text:
      i. Capitalize the first letter of every line in the passage.
         Two lines are missing from the passages.
      ii. In the first quote, insert the line They have their exits and their entrances, after the second line.
iii. In the second stanza type The course of true love never did run
smooth; after the second line.

Shakespeare has been misquoted! Change these words to restore the
quotes to their original form.

iv. In the first quote, delete the word people and insert men and women,
change rolls to parts.

v. In the second quote, replace the following words: always with ay, anything with aught, class with blood.

d. Proofread your work and make any needed corrections.

e. Choose File/Save to update your changes.

f. Print your work.

g. Quit Word.

3. Apple’s Beginnings

a. Open the Beginnings file.

b. Save As Beginnings U3.

c. Make these text changes:

i. Capitalize the first letter of the each word in the title, beginning with
the year 1971. Capitalize the first letter in each word, except the words
as and in.

ii. Replace the period after year with a colon, and delete the period at the
end of the title.

Some words are misquoted. Change the following to restore the orig­
inal text:

iii. Replace junior to with younger than.

iv. Replace immediately with at once.

v. Replace appeared with showed.

vi. Replace the second ability with strength.

vii. Type this paragraph after the first one:

But for Woz, the cement in the relationship wasn’t
electronics. It was pranks. Jobs, he discovered, was
another prankster.

viii. Separate the paragraphs with a blank line.

d. Proofread your work and make any needed corrections.

e. Choose File/Save to update your changes.
f. Print your work.

g. Quit MS Word.

4. Create short original documents. Begin each with a title. Create a blank line after the title to separate it from the other paragraphs. Choose File/Save As, give your document an original name, edit on screen, choose File/Save, and print your work.

a. Describe your computer background and the reasons you are learning to use a computer.

b. Describe an important event in your life.

c. Write a short letter to a friend. Tell your friend something you have learned about the Macintosh computer.

Review Questions

Multiple Choice

1. One distinction between a word processor and a typewriter is that when you press a computer key

   a. the text appears on the screen instead of on a piece of paper
   b. the text automatically appears on paper
   c. text appears simultaneously on the screen and on paper
   d. none of these

2. The exact spot where text will be inserted or deleted is called the

   a. insertion point
   b. I-beam
   c. arrow pointer
   d. a. and c.

3. Word wrap means that

   a. text automatically moves down to the next line when it reaches the limit of the right margin
   b. you always press the [Return] key to wrap text to the next line
   c. ends of lines compensate when you insert or delete text from the center of the paragraph
   d. a. and c.
4. To save your work, choose
   a. File/Save
   b. Document/Save
   c. Save/File
   d. Save/Document

5. Before printing a file, you should always
   a. select all text
   b. save
   c. press Undo
   d. delete all your text and save

**True or False**

1. ___ A selected text block can be erased by pressing the Delete key.
2. ___ Repeat keys continue repeating the character as long as they are pressed
3. ___ You may simultaneously select as many text blocks in your document as you want.
4. ___ Inserting and deleting text are examples of editing.
5. ___ Pressing the spacebar moves the insertion point to the right.

**Fill In the Blanks**

The crossword puzzle in Figure 3.29 contains word processing terms. Read the clues and fill in the answer at the corresponding number and position. The term list following the exercise will help you.

**ACROSS**

1. To input text.

7. A _________ _________ application lets you enter and manipulate text on the computer screen. Two words, no blank space between the words.

8. Command keys across the top of the extended keyboards are called F keys or _____keys (see Table 3.1).

9. Keys that produce letters, numbers, and other characters (see Table 3.1).

11. A letter, number, or other special symbol.

13. Opposite of soft. Created with the Return key.
15. To add text between existing text.

17. Erase.

18. Used to move the insertion point location. Two words, no blank space between the words.

19. The command that stores your work to a disk.

DOWN

2. The [Caps Lock] key is a ______ key because it alternates between upper- and lowercase each time it is pressed.

3. No longer highlighted is ____________________________ ed.

4. Four directional keys that can be used to move the cursor up, down, left, and right instead of using the mouse.

5. A selected range of text. Two words, no blank space between the words.

6. Pressing Return creates a new _____.

7. Automatically moves text to the right and down one line. Two words, no blank space between the words.

10. The command to make a hard copy of your work.
12. When you insert or delete text, you _____ your work.


**TERM LIST**

<table>
<thead>
<tr>
<th>Term</th>
<th>Function</th>
<th>Save</th>
</tr>
</thead>
<tbody>
<tr>
<td>alphanumeric</td>
<td>function</td>
<td>save</td>
</tr>
<tr>
<td>arrow</td>
<td>hard</td>
<td>soft</td>
</tr>
<tr>
<td>character</td>
<td>I-beam</td>
<td>text block</td>
</tr>
<tr>
<td>delete</td>
<td>insert</td>
<td>toggle</td>
</tr>
<tr>
<td>deselect</td>
<td>keyboard</td>
<td>word processing</td>
</tr>
<tr>
<td>edit</td>
<td>paragraph</td>
<td>word wrap</td>
</tr>
<tr>
<td>enter</td>
<td>print</td>
<td></td>
</tr>
</tbody>
</table>

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**Key Terms**

- Active disk
- Alphanumeric key
- Arrow key
- Backspace key
- Button
- Caps lock
- Character
- Command (⌘) key
- Control key
- Delete
- Delete key
- Deselect
- Disk contents window
- Document name
- Document name text entry box
- End of file mark
- Enter key
- Entering text
- Extended keyboard
- Function key
- Hard return
- I-beam pointer
- Insert Text
- Insertion point
- Keyboard
- Manual return
- Menu bar
- Microsoft Word
- Modifier key
- MS Word
- Num lock key
- Numeric keypad
- Option key
- Paragraph
- Power on key
- Repeat key
- Replace
- Return key
- Ribbon
- Right margin
- Selected text block
- Shift key
- Soft return
- Special key
- Tab key
- Text
- Text block
- Text deletion
- Toggle key
- Toolbar
- Untitled
- Word
- Word processing
- Word processor
- Word wrap
Desk accessories are small programs that assist you with day-to-day tasks, such as calculating numbers, jotting down notes, checking the time or date, setting an alarm, or locating a picture from your graphics collection. Following the Desktop metaphor, the tools that you might find on your actual desktop—such as a clock, a pad of paper, or a calculator—have Macintosh equivalents: the Alarm Clock, the Note Pad, and the Calculator. Each equivalent is a desk accessory.

Like the tools that sit on the top of your desk, desk accessories need to be available whenever you need them. Whenever you pull down the Apple menu, the desk accessories are there. Unit 4 shows you how to use the standard desk accessories that come with the System 7 software.

Learning Objectives

At the completion of this unit you should know
1. what desk accessories are,
2. when and how they may be used.

At the completion of this unit you should be able to
1. set, change, and display the time, date, and alarm on the Alarm Clock,
2. perform calculations with the Calculator,
3. select a printer with the Chooser,
4. locate "hidden" keyboard characters with Key Caps,
5. write a note on the Note Pad,
6. play the Puzzle.

The Standard Desk Accessories

Standard desk accessories are included with your computer’s system software while other desk accessories must be obtained separately. Unit 4 focuses on Apple Computer Inc.’s standard desk accessories. Before you can proceed, you must find out if your system lacks any of the standard desk accessories.

GUIDED ACTIVITY 4.1

Checking Your Apple Menu Choices

Begin at the Desktop to examine your Macintosh’s Apple menu and to check off each item against the standard list in Figure 4.1.

1. Press the Apple menu title, Apple menu title, to compare your Apple menu with the checklist in Figure 4.1.

2. Check off each standard Apple menu item that appears on your screen. Don’t worry about any extra items that you may have.

3. Which items are you missing?

NOTE You will be unable to complete the specific Guided Activities without them. Ask your instructor to install them if possible.
Alarm Clock

The Alarm Clock is the Macintosh equivalent of the clock and calendar found on the top of your desk. Pull down the Alarm Clock to check the current date and time; set the alarm to remember to take a computer break or to go to a meeting. The Alarm Clock uses the Mac’s built-in battery powered clock and calendar to display the current date and time.

Alarm Clock Views

The Alarm Clock has two views, shown in Figure 4.2. The small view displays a digital clock. The large view shows the time, date, and alarm— and lets you change the settings. The flag in the upper-right corner of the Alarm Clock window toggles between the large and small views. The flag faces up in small view and down in large view.

Alarm Clock Settings

Large view lets you change the Alarm Clock’s time, date, and alarm time—and turn the alarm itself on or off. As Figure 4.3 shows, the large view Alarm Clock window is divided into three panels. The top panel displays the time, the middle panel displays and changes a specific setting, and the bottom panel lets you choose whether you wish to change the time or date, or set the alarm.
GUIDED ACTIVITY 4.2

Using the Alarm Clock

This Guided Activity shows you how to use the Alarm Clock desk accessory. You will display the Alarm Clock window, toggle between small and large view, and set the time and date. Then you will learn to operate the alarm: set it, observe its alert when it goes off, and turn it off two ways: temporarily and permanently. At the end of the Guided Activity, you will verify that the Alarm Clock displays the current date and time and that the alarm is off.

1. Choose ▲/Alarm Clock to display the Alarm Clock window. The Alarm Clock window opens in the view and window location where it was last closed.

2. Locate the flag in the upper right corner of the Alarm Clock window.

3. Click the flag to display the other view. Toggle (click the flag) several times. Finish in large view.

4. Set the time.
   a. Click the clock icon. The clock icon will highlight, and the middle panel will display the time setting as in Figure 4.4.

   ![Figure 4.4](image)

   The time setting has four changeable areas: hour, minute, second, and a.m./p.m. When you click one, it highlights and change arrows appear to the right of the time setting as in Figure 4.5.

   ![Figure 4.5](image)

   b. Click the hour to select it.

   c. Use the change arrows to change the hour.
      i. Click the up or down arrow to the right of the time. The up arrow increases the number; the down arrow makes it smaller.
      ii. Click the clock icon again to register or set the time. The setting arrows will disappear. Only the part of the time that you adjusted is changed. Everything else matches the ticking clock display.
5. Set the date.

a. Click the **date icon**. The date icon will highlight, and the middle panel will display the **date setting** shown in Figure 4.6. The date setting has three changeable areas: month, day, and year.¹

![Figure 4.6 Date setting middle panel, month selected](image)

b. Click on the area to change (day, month, year), click the up or down arrows to reach the date you want, and click the date icon to set the changes.

6. Set the alarm time.

a. Click the **alarm icon**. The alarm icon will highlight and the middle panel will display the **alarm setting** shown in Figure 4.7. It looks just like the time setting with an **alarm indicator** to the left of the time.

![Figure 4.7 Alarm setting middle panel](image)

Like the time setting, the alarm setting can change four variables: hour, minute, second, a.m./p.m.

b. Click the minute and then click the up or down arrows until the alarm setting is three minutes ahead of the current time. You can also type the number(s) to replace the selected item.

c. Click the alarm icon to set the alarm time.

7. Set the alarm.

a. Click the alarm indicator. The alarm indicator should move from the off to the on position, and the alarm clock icon will display "rays" above its bell to show that it is activated. Figure 4.8 shows what to expect.

![Figure 4.8 The Alarm's off and on positions](image)

¹ Note that these are U.S. settings. European settings are date, month, year.
b. Wait for the alarm. When the alarm goes off, the computer makes its alert sound once. The Apple menu title, ☰️, will continue to flash alternately with the alarm clock icon until you turn off the alarm—even if you turn the computer off and on again.

**NOTE**  If the alarm doesn’t go off, you made a mistake or were too slow. Repeat steps 6 and 7. Be sure that no change arrows show and that the a.m./p.m. setting of the time and the alarm are the same.

8. Turn off the alarm. To temporarily turn off the alarm—until the same time tomorrow—click the flag to toggle to small view, and close the window. To permanently turn off the alarm, click the flag to switch to large view, click the alarm indicator to the off position, and close the window.

9. Before closing the Alarm Clock window, you should
   a. Check that your Alarm Clock has the correct date. If not, change it.
   b. Check that your Alarm Clock has the correct time. If not, change it.
   c. Permanently turn off the alarm.

10. Close the Alarm Clock window.

---

**Calculator**

The **Calculator**, shown in Figure 4.9, mimics the simple four-function calculator often found on a desk. You click the numbers and function keys of the desktop calculator with the mouse pointer, as if you were pressing actual calculator keys. The calculator’s arithmetic operators are addition (+), subtraction (−), multiplication (×), and division (/). You can also use the keyboard’s numeric keypad; it’s faster.
GUIDED ACTIVITY 4.3

Using the Calculator

In this Guided Activity, you will open the Calculator window and use it to do some simple arithmetic problems. Begin at the Desktop.

1. Choose ⌘/Calculator.

2. Click the clear key, so that the number display begins with zero.

3. Add 1 + 2 with the mouse.
   a. Click the 1 key. 1 will appear in the number display area.
   b. Click the + key
      Nothing will change in the number display area.
   c. Click the 2 key. 2 will appear in the number display area.
   d. Click the = key. 3 will appear in the number display area.

4. Use the numeric keypad to calculate 13 - 7.
   a. Click the 0 key. 0 will appear in the number display area.
   b. Click the 1 key. 1 will appear in the number display area.
   c. Click the 3 key. 13 will appear in the number display area.
   d. Click the - key. Nothing will change in the number display area.
   e. Click the 7 key. 7 will appear in the number display area.
   f. Click the = key. 6 will appear in the number display area.

5. Calculate the following using the mouse for a., c., and e. and the keypad for b., d., and f. Clear each answer before proceeding to the next calculation.
   a. 3 * 5 15 will appear in the number display area.
   b. 6 / 4 1.5 will appear in the number display area.
   c. Multiply 8402 times 475 3990950 will appear in the number display area.
   d. Divide 23567.96 by 354.9 66.407326007 will appear in the number display area.
   e. Subtract 675 from 34876 34201 will appear in the number display area.
   f. Add 278, 5768, and 946 6992. Do not clear the last answer.

Which way do you prefer?

6. Close the Calculator window like any other Macintosh window.
7. Reopen the Calculator. It should still display the results of its last calculation.
8. Clear the number display area, and close the Calculator.

**Chooser**

The *Chooser* (shown in figure 4.10) lets you select from the printers and networks that are attached to your Macintosh. You only need to choose the first time the printer or network is used—or if you wish to switch printers; for example, from an ImageWriter to a LaserWriter. The Chooser remembers your choice until you choose again, even when your Mac is turned off.

The Chooser window contains two sections. The left section displays icons of the printer and network *driver software*; these are the software instructions that manage these devices. The right section displays the names of the actual devices that are connected to your system. When you open the Chooser, the right section will be blank. To select a device, you must first select its driver. Then, the names of all available devices operated by that driver will appear in the right box. A device must be turned on and physically connected to your computer to be available. Click on the name of the device you want, and close the Chooser window. The device is not actually chosen until you close the Chooser by clicking its close box.

It is not necessary to open the Chooser to review your printer choice. Each time you choose File/Print, the Print dialog box displays the name of the specific printer last chosen on this computer, the Personal LaserWriter NTR in Figure 4.11.
GUIDED ACTIVITY 4.4
Choosing a Printer

This Guided Activity shows you how to choose a printer. Be sure that the printer you wish to select is turned on and connected to your computer. Start at the Desktop.

**NOTE** Do not change any other settings in the Chooser window.

1. Choose ⌘/Chooser to open the Chooser.
2. Click the appropriate printer driver icon in the left box.
3. Click the name of your printer in the right box.
4. Close the Chooser.

Key Caps

Macintosh fonts include many more characters than a standard typewriter. Since these characters are not displayed on the physical keyboard, they are known as **hidden characters**. Table 4.1 shows some of the hidden characters that you can produce.

<table>
<thead>
<tr>
<th>TABLE 4.1</th>
<th>Some hidden characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Math symbols</td>
<td>π</td>
</tr>
<tr>
<td>Business and legal symbols</td>
<td>®</td>
</tr>
<tr>
<td>Typographic or “smart” quotes</td>
<td>“ ”</td>
</tr>
<tr>
<td>Accented letters</td>
<td>í</td>
</tr>
<tr>
<td>Non-English letters/punctuation</td>
<td>ç</td>
</tr>
<tr>
<td>Apple Computer Inc.’s logo</td>
<td>🍎</td>
</tr>
</tbody>
</table>

How do you produce the hidden characters? Hidden characters are usually typed by combining the Option key, or Option + Shift, with an alphanumeric
character. Since there are too many combinations to memorize, and because the hidden characters available vary from font to font, the Key Caps desk accessory lets you look up the characters available for each font installed in your system and lets you find out how each is keyed.

Another use of Key Caps is to look up the graphics available in a symbolic font. A font is a named set of characters of distinct design. Symbolic fonts have no standard characters at all; even without the Option key, tapping an alphanumeric key produces a picture or symbol. Table 4.2 shows “computer” in Times, Zapf Dingbats, Bill’s Dingbats, and Symbol, a specialty font with many Greek letters and symbols.

<table>
<thead>
<tr>
<th>TABLE 4.2</th>
<th>Symbolic fonts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FONT NAME</strong></td>
<td><strong>LOWERCASE</strong></td>
</tr>
<tr>
<td>Times</td>
<td>computer</td>
</tr>
<tr>
<td>Zapf Dingbats</td>
<td>* DOO+Til:lo+</td>
</tr>
<tr>
<td>Bill’s Dingbats</td>
<td>•-111+fo</td>
</tr>
<tr>
<td>Symbol</td>
<td>xoµmyt£p</td>
</tr>
</tbody>
</table>

While you don’t usually type sentences and paragraphs in a symbolic font (unless you want to write something in code), individual symbol or “dingbat” characters can be useful. For example, a pointing hand, “£££££” is the Zapf Dingbat “+.” Follow the next Guided Activity to discover other hidden characters to enrich your documents.

**GUIDED ACTIVITY 4.5**

**Finding Hidden Characters with Key Caps**

This Guided Activity shows you how to use the Key Caps desk accessory to look up hidden characters and find out which keystrokes produce them. Begin at the Desktop.

**NOTE**

You need Times, Zapf Dingbats, and Chicago installed in your system to complete this Guided Activity.

1. Choose /Key Caps to display one of the Key Caps windows shown in Figure 4.12. Key Caps maps out the actual keyboard attached to your Macintosh.
When the Key Caps window is active, the menu bar changes to resemble Figure 4.13.

2. Open the Key Caps menu. Key Caps will drop-down a menu of all the fonts currently installed in your system. Your list will probably be different from the one in Figure 4.14.

3. Choose Key Caps/Times to see the lowercase Times characters displayed on the keyboard in the Key Caps window.

4. Watch the Times keyboard change depending on which modifier key you press.
   a. Press [Shift] to see the capital letters and special symbols above the numbers and punctuation marks. Note that the shift key turns black in the Key Caps window to show that you are pressing it.
   b. Press [Option] to see some hidden characters. Some keys have an empty box instead of a character. If a character does not exist for a particular key combination, Key Caps displays a rectangle, shown at left.
   c. Press [Option][Shift] together to see different characters.

5. Use Key Caps to discover how to make the special character \( \Pi \) in Times.
   a. Press [Option][Shift] to make \( \Pi \) appear in the Key Caps window.
b. Looking at your actual keyboard, determine which alphanumeric key types it.

i. With Option Shift still pressed down, type the alphanumeric key you think will produce the Π.

ii. As you type, the characters will appear in the box above the keyboard called the entry bar. In this way, you can check to be sure you have the right key combination.

6. Use Key Caps to see the graphics available in Zapf Dingbats.

a. Choose Key Caps/Zapf Dingbats to see the Zapf Dingbat keyboard.

b. Press Shift to see more graphics (see Figure 4.15).

c. Press Option to see another set of graphics.

d. Press Option Shift to see still more graphics.

7. The Σ in Figure 4.16 was typed in the Key Caps entry bar by selecting Key Caps/Chicago and pressing Option W. Try it.
8. Use Key Caps to discover:
   a. Which three keys in Times make $\mathbb{Q}$?
   b. How to type ☣ in Zapf Dingbats?
   c. How to type ε in Chicago?
   d. How the ⊠ box is made in Zapf Dingbats?
9. Close the Key Caps window when you are done.

---

**GUIDED ACTIVITY 4.6**

*Using the Note Pad*

In this Guided Activity you will open the Note Pad, turn note pages, write yourself a note, see that it is saved, and remove the note from the Note Pad. Begin at the Desktop.

1. Choose $\mathbb{Q}$/Note Pad. The Note Pad window will open on note 1.
2. Referring to Figure 4.17, click the turned-up corner near the lower-left corner to turn to note 2.
3. Click two more times to turn to note 4.
4. Click the left corner of the Note Pad two times to turn back to note 2.
5. Type a short note on note 2.

6. Close and reopen the Note Pad to see that the note has been saved. The Note Pad always opens on note 1. You will have to turn to note 2 to see your note. Notes remain unless someone removes them.

7. Clear your note. Highlight all the text in your note and click delete/backspace to remove it.

8. Close the Note Pad.

---

Puzzle

Not all applications are work-related. Sometimes it’s nice to have a break. The Puzzle is an on-screen version of the classic children’s puzzle in which you move number tiles around to arrange them in sequence (1–15). However, since it’s a Macintosh Puzzle, it has some tricks!

GUIDED ACTIVITY 4.7

Playing with the Puzzle

In Guided Activity 4.7 you will open the Puzzle (Figure 4.18), move the pieces, view numbers instead of pictures, hopefully solve the Puzzle, and put the Puzzle away. Begin at the Desktop.

1. Choose /Puzzle. It is, surprise, a jumbled Apple Computer, Inc. logo.

2. Move the Puzzle pieces one at a time or in a row by clicking on the piece or row next to the empty square. It is easier to solve the Puzzle if each piece displays a number instead of part of the Apple logo.

3. Change it.
   a. Be sure the Puzzle is the active window (it has a close box).
   b. Choose Edit/Clear. The scrambled logo will change to numbers, as in Figure 4.19.
4. After you solve the number Puzzle, choose Edit/Clear to see the unscrambled graphic shown in Figure 4.20.

5. When you have finished playing with the Puzzle, close its window to put it away. Each time you open the Puzzle, its tiles are scrambled anew.

---

**The Scrapbook**

The Scrapbook desk accessory creates a file called the Scrapbook file in which you can place and store frequently used text and graphic images for later use. You will use the Scrapbook in Unit 9 as you learn to manipulate graphics.

---

**Summary**

From the activities you have performed in Unit 4, you can appreciate the usefulness of the Apple Menu. No matter what application you are using, the Apple Menu items are available to use. You can set and use the Alarm Clock, calculate with the Calculator, choose a printer with the Chooser, locate hidden characters with Key Caps, write on the Note Pad, and play the Puzzle.
Exercises

1. Locate these symbols on the keyboard or in Key Caps, and write down their key sequence.

<table>
<thead>
<tr>
<th>Font</th>
<th>Symbol</th>
<th>Name</th>
<th>Key sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Times</td>
<td>@</td>
<td>at</td>
<td><strong><strong>+</strong></strong></td>
</tr>
<tr>
<td>b. Times</td>
<td>•</td>
<td>bullet</td>
<td><strong><strong>+</strong></strong></td>
</tr>
<tr>
<td>c. Times</td>
<td>TM</td>
<td>trademark</td>
<td><strong><strong>+</strong></strong></td>
</tr>
<tr>
<td>d. Times</td>
<td>©</td>
<td>copyright</td>
<td><strong><strong>+</strong></strong></td>
</tr>
<tr>
<td>e. Times</td>
<td>®</td>
<td>registered</td>
<td><strong><strong>+</strong></strong></td>
</tr>
<tr>
<td>f. Times</td>
<td>°</td>
<td>degree</td>
<td><strong><strong>+</strong></strong></td>
</tr>
<tr>
<td>g. Zapf Dingbats</td>
<td>⚽</td>
<td>eight ball</td>
<td><strong><strong>+</strong></strong>+____</td>
</tr>
<tr>
<td>h. Zapf Dingbats</td>
<td>✄</td>
<td>scissors</td>
<td><strong><strong>+</strong></strong></td>
</tr>
</tbody>
</table>

2. Use the Calculator to solve the following math problems.

a. $25.55 + 37.42$

b. $25.55 - 37.42$

c. $29 \times 56 / 4$

d. $1/2$

e. $3/4$

f. $(30.95 + 47.56 + 22.38 + 52.06) / 4$

Review Questions

Multiple Choice

1. The Desk Accessories
   a. complement your electronic Desktop
   b. vary between computers
   c. are small utility programs
   d. all of these
2. With the Chooser you can only select a printer that
   a. is connected to your computer
   b. has been turned on, has its driver software installed, and has its icon
      selected in the Chooser window
   c. has paper
   d. a. and b.

3. The Alarm Clock is the Macintosh equivalent of a(n)
   a. appointment calendar
   b. pencil sharpener
   c. clock and calendar
   d. paper clip holder

4. Key Caps offers
   a. an on-screen directory of hidden symbols not visible on the keyboard
   b. an on-screen directory of hidden symbols and the key combinations needed
      to produce them
   c. an on-screen directory of visible and hidden symbols, and the key combina­
      tions needed to produce them
   d. none of these

5. The Note Pad lets you type
   a. up to 8 note pad size pages
   b. formatted text
   c. and display graphics
   d. all of these

_**True or False**_

1. __ If you are having difficulty printing, look under the Chooser and
   (re)select its driver and the printer’s name.

2. __ The easiest way to find the correct key combinations for a hidden
   character is to select each font and to press all the keys on the keyboard
   until you stumble onto the correct symbol.

3. __ You can change the time in both the small and large views in the
   Alarm Clock.
4. ___ You can only solve the Puzzle in its picture format.

5. ___ You must use the Chooser every time you want to print your work.

**Fill In the Blanks**

Desk Accessories are listed alphabetically under the ♦. Match these accessories to their purpose.

<table>
<thead>
<tr>
<th>Desk accessory</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ___Puzzle</td>
<td>a. Selects a printer</td>
</tr>
<tr>
<td>2. ___Alarm Clock</td>
<td>b. Retains messages</td>
</tr>
<tr>
<td>3. ___Calculator</td>
<td>c. Helps you to find hidden characters</td>
</tr>
<tr>
<td>4. ___Chooser</td>
<td>d. Strictly play time</td>
</tr>
<tr>
<td>5. ___Key Caps</td>
<td>e. Calculate numbers</td>
</tr>
<tr>
<td>6. ___Note Pad</td>
<td>f. Set time, date, alarm</td>
</tr>
<tr>
<td></td>
<td>g. Provides information about the computer system</td>
</tr>
</tbody>
</table>

**Key Terms**

Alarm Clock  Date icon  Large view
Alarm icon   Date setting  Note pad
Alarm indicator  Desk accessory  Option + shift
Alarm setting  Down arrow  Option key
Arithmetic operator  Driver software  Puzzle
Available  Entry bar  Set the time
Calculator  Flag  Small view
Change arrow  Font  Standard desk accessories
Chooser  Hidden character  Symbolic font
Clear key  Icon font  Time setting
Clock icon  Key Caps  Up arrow
The Macintosh is a machine of metaphors. Its icons resemble everyday things, such as desks, file cabinets, push buttons, manila folders, papers, and wastebaskets. The Finder is the system software file that creates these on-screen equivalents, manages the Macintosh icons and windows, and displays them on the Desktop.

Unit 5 shows you how to use icons and windows effectively. You will begin by exploring the relationship among the graphical Desktop, the Finder software that creates it, and the invisible Desktop file that keeps each file's statistics. Next, you will learn to identify basic icon types and to understand the function of each type. Finally, you will manipulate icons and windows to view them in different ways on the Desktop.

Learning Objectives

At the completion of this unit you should know

1. the relationship among the Finder application, the Desktop file, and the Desktop workspace,

2. the basic icon types: disk, file, and folder,

3. the icon naming rules,

4. the distinction between a Desktop icon's name and its graphic,

---

1 Thanks to Inside the Apple Macintosh for this title. According to the American Heritage Dictionary, a metaphor is a figure of speech in which a term is translated from the object it ordinarily designates to an object it may designate only by implicit comparison.

2 Or at least most of them.
5. the purpose of Desktop windows,
6. the difference between an active and an inactive window,
7. how the scroll bars, zoom box, and size box allow you to change a window’s size and which icons it displays.

At the completion of this unit you should be able to
1. manipulate icons:
   a. identify icon types by their graphic,
   b. use File/Get Info to learn more about specific icons,
   c. select and deselect icons by graphic and by name,
   d. duplicate an icon,
   e. change an icon’s name,
2. manipulate windows:
   a. activate and deactivate windows,
   b. scroll, resize, and zoom a Desktop window to see more or other icons,
   c. relocate a Desktop window,
   d. work with multiple windows.

The Finder and the Desktop

The Finder is part of the system software that launches automatically when you boot up your Macintosh. It is called the Finder because it lets you locate or find, move, open, close, and delete files and folders. When you initialize a disk, the Finder writes an invisible directory or table of contents called the Desktop file onto that disk. Without a disk’s Desktop file, the Mac cannot locate anything stored on that disk. Each disk’s Desktop file is invisible so that you won’t accidentally delete it.

The Finder uses the Desktop file to manage Desktop icons and windows. Between the time you start up and Shut Down, the Finder manages your path to and from applications, their data, and the Desktop workspace. Whenever you add or delete a file to a disk, change a file’s name or location, or move or resize a window, the Finder updates those changes on the relevant Desktop file.

The Finder graphically creates and manages the Desktop workspace, the simulated work area for all Macintosh tasks. The Desktop’s background pattern represents the top surface of your physical desk. On top of the Desktop workspace rest the icons and windows of your current work. Actually, the Desktop represents the work space for your entire office rather than just your desk—unless you keep your filing cabinets, copy machine, and wastebasket on the top of your desk.
Many people use the terms Desktop (the workspace), and Finder (the application name) interchangeably.

Desktop Icons

The Finder generates icons to represent the disks, applications, documents, and folders that you use in your Desktop work.

Icon Identification

Desktop icons can be divided into three basic categories: storage icons, file icons, and folder icons. Icons provide a quick visual clue of each item’s function.

Storage Icons

Each storage icon represents an individual hard or floppy disk or other storage medium that is mounted on the Desktop. Think of each storage icon as a Macintosh filing cabinet, capable of holding many files and folders. Figure 5.1 gives examples of storage icons. Storage media manufacturers create their own storage icons, so there are many more than the ones shown here.

![Figure 5.1: Storage icons](image)

Floppy disk  Generic hard disk  Custom hard disks  Networked disk

File Icons

Recall that files are named collections of information stored on a disk. Whenever you create a new file (by saving an Untitled document, for example), the Finder draws a Desktop icon for that document. These Finder-drawn icons are called generic icons. The three basic file types—application, document, and system—have the generic icons shown in Table 5.1. When you see them, you can identify the type of file they represent.

Most applications have custom icons, individually designed graphics that replace the generic picture. Figure 5.2 shows custom icons from some commonly used Macintosh applications. Learn to recognize your regularly used applications’ custom icons.

Custom document icons usually incorporate a page of paper plus the application logo in their design. Compare the corresponding custom document icons in Figure 5.3 to their application icons in Figure 5.2.

Apple customized its system files and folders when it released System 7. Figure 5.4 shows some of these custom system icons.
Generic file icons

**TABLE 5.1**

<table>
<thead>
<tr>
<th>FILE ICON</th>
<th>LARGE VIEW</th>
<th>SMALL VIEW</th>
<th>FILE TYPE AND DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application</td>
<td><img src="image" alt="application" /></td>
<td>application</td>
<td><strong>Application icons</strong> represent the set of software instructions that allow you to do work on the computer. The generic application icon shows a hand writing on a piece of paper.</td>
</tr>
<tr>
<td>Document</td>
<td><img src="image" alt="document" /></td>
<td>document</td>
<td><strong>Document icons</strong> represent stored work done using a particular application. The generic document icon shows a printed page with the upper-right corner folded down.</td>
</tr>
<tr>
<td>Finder</td>
<td><img src="image" alt="Finder" /></td>
<td>Finder (Looks like a document)</td>
<td><strong>System icons</strong> represent the special software files that run your Macintosh.</td>
</tr>
</tbody>
</table>

**FIGURE 5.2**

Custom application icons

- Microsoft Word
- SuperPaint 2.0
- Microsoft Excel
- ClarisWorks
- WordPerfect
- PageMaker 4.2
- MultiLedger™
- Solitaire 1.1

**FIGURE 5.3**

Corresponding custom document icons (Solitaire 1.1 shown in Figure 5.2 does not create documents)

- Long Doc 1
- Spider
- Grading worksheet
- Sales Report
- Report
- brochure
- heiman personal

**FIGURE 5.4**

Custom system icons

- System
- Finder
- Clipboard
- Extensions
- Note Pad File
- Apple Menu Items
- Scrapbook File
- Preferences
- Control Panels
**Folder Icons**

Folders are organizational containers that can hold files and other folders. Folder icons look and function like manila folders; each opens to display a Desktop window of its contents. Figure 5.5 shows typical folder icons.

The Trash is a special kind of folder; it is the last folder into which things go before they are discarded. The Trash icon has two states, empty and bulging. The Trash icon bulges to indicate that it contains at least one icon, either file or folder. If you want to see what is in the Trash, open its icon.

**File/Get Info**

Sometimes, it is difficult to visually identify an icon. Fortunately, the Finder can help you. Remember the invisible Desktop file that keeps track of all your files? When you select an icon and then choose File/Get Info, an information window appears that displays statistics about the selected icon. Although the categories vary depending on the type of icon you have selected, the information box always displays the icon's graphic and name, its *kind* or type, its *size* on disk (in K or MB) and its storage location or *where*. Figure 5.6 shows a Data Disk Info window.

**Icon Selection**

Each icon has three parts: its graphic, its name, and its window. Like everything else on the Macintosh, icons must be selected before they can be used.
Figure 5.7 differentiates between an icon’s graphic and its name. Depending on the part of the icon you select, you can take different actions. When you click an icon’s graphic, the entire icon highlights to show that it can be moved, opened, and so on. When you click an icon’s name, however, the icon highlights and a box appears around its name to indicate that the name may be edited. To deselect both the graphic and its name, click in the empty space next to the icon. Figure 5.8 shows the pointer position for icon graphic selection, name selection, and deselection respectively.

Icon Names

The icon’s name distinguishes it from other icons on the same disk. Icon names may use any combination of letters, numbers, spaces, and symbols produced by the Mac keyboard except the colon (:) Colons are reserved for pathways, designating icon location.

**NOTE** If you use a colon in an icon name, the Mac automatically turns the colon into a hyphen.

When you name an icon, use descriptive names such as “letter to mom” or “1994 budget” so that you can remember what the icon is without opening it. The Macintosh permits long icon names: up to 27 characters for a disk name, 31 for a file name, and 32 for a folder name. However, you will rarely need to use such a long icon name. Short names take up less Desktop room, and some dialog boxes and windows can only display part of a name, although such a shortened or truncated name will expand somewhat when clicked.

Capital letters are uppercase letters, other letters are lowercase. Icon names are not case sensitive; from the Finder’s perspective, Lab 1 = lab 1 = LAB 1. Many of the file names on the West Student Data Disk intentionally use lowercase letters. Capital letters are wider than lowercase letters, and take up more room on the Desktop or in a dialog box. Compare the sizes of the West Student Data Disk icon name in Figure 5.9.

It’s easy to change an icon’s name. You simply select the name and edit it like text in a word processing program. If the entire name is selected, it will be
replaced by your new name. If you place an insertion point within an icon name or highlight a text block, text will be inserted at that point.

**NOTE** Never change the names of the files in your System Folder. If you do, your Macintosh won’t be able to find them, and it won’t start up.

**GUIDED ACTIVITY 5.1**

**Manipulating Icons**

Guided Activity 5.1 leads you through many aspects of icon manipulation. You will select icons, get information about them, deselect icons, duplicate icons, and rename icons. Begin at the Desktop with all windows closed.

1. Insert your Data Disk and wait while it mounts.

   Notice that its icon is already selected. When an icon is selected, you can open it, move it, change its color, or manipulate it in some other way.

2. Click the Desktop workspace to deselect the Data Disk icon. While deselected, an icon cannot be manipulated.

3. Click the Data Disk icon’s name. There will be a few seconds’ delay before the outline box appears. Apple did this intentionally so people would not accidentally change icon names.

   An icon’s name can be changed when selected. Since the icon itself is also selected, you can also open the icon, duplicate it, or perform other operations on it.

4. Click the Desktop workspace to deselect the Data Disk icon.

5. Double-click the Data Disk’s graphic to simultaneously select the icon and open its window.

   The Data Disk’s icon will dim to indicate that its window is open as in Figure 5.10.

   Your Data Disk window might display different icons or different icon arrangements, depending on which files you have saved onto it.
6. Select and deselect each icon in the Data Disk window.
   a. Be sure that you can differentiate between icon selection and name selection.
   b. Finish with all icons deselected.

   **NOTE** If you accidentally double-click a file icon, you will open it. You have to wait until it loads. File/Quit will take you back to the Desktop.

7. Close any open windows.

   a. Select the Data Disk.
   b. Choose File/Get Info.

   An information box similar to Figure 5.6 should appear.
   c. Notice the disk icon’s kind, size, and location.

   **NOTE** Do not alter any Get Info boxes in this unit.
   d. Close the Get Info window.

   a. Open the Data Disk.
   b. Select the First Try icon.
   c. Choose File/Get Info.
   d. Note the document file icon’s kind, size, and location.
   e. Close the Get Info window.

10. Get information about the West Student Data Disk folder icon.
    a. Select the West Student Data Disk folder icon.
    b. Choose File/Get Info.
    c. Notice the folder icon’s kind, size, location, and how many items it contains.
    d. Close the Get Info window.
    e. Open the West Student Data Disk folder to see its window (Figure 5.13).

    The end of its name in the title bar is truncated because the window is so small. The information bar tells you that the window contains only 15 items while Get Info said the folder contained 53 items. That’s because the other 38 items are nested inside of other folders.

11. Get information about the TeachText application icon.
    a. Select the TeachText application icon.
    b. Choose File/Get Info.
c. Notice the application file icon’s kind, size, location.
d. Close the Get Info window.
e. Close the West Student Data Disk folder window.

When you duplicate a file, you replicate it. This is a form of backup.
a. Select First Try.
b. Choose File/Duplicate.
c. Wait while the Finder duplicates First Try, names the duplicate First Try copy, and places its icon slightly offset from the original.

d. Drag First Try copy next to its original.
Only the outline will move until you release the mouse button.

13. Change the name First Try copy to Second Try. Figure 5.11 shows the progression.
a. Click First Try copy’s name to highlight it. After a few seconds’ delay, a box will surround the selected name.
b. With the name still highlighted, slowly type Second Try. The first character you type will replace the old name. An insertion point travels along as you type.
c. Press Enter to register the icon’s new name, and move from text selection mode to icon selection mode.

**Figure 5.11**
Steps to change an icon’s name
14. Edit an icon’s name. Change Second Try to second try.
   a. Click the Second Try’s name to highlight it.
   b. Point just to the right of the S in Second. The pointer will become an I-beam when it is over the selected icon’s name.
   c. Click to set the insertion point.
   d. Press Delete to remove the S.
   e. Type s.
   f. Highlight the T in Try.
   g. Type t to replace the T.
   h. Deselect the second try icon. Deselection also registers a name change.

The West Student Data Disk folder’s name is too long.

15. Adapt step 14 to change its name to West Student Data.
   a. Select the icon’s name.
   b. Select the word Disk and the space that precedes it and delete them.
   c. Deselect the West Student Data folder icon.

16. Close the data disk window.

The Desktop Window

Conceptually, each Desktop window provides a view of a disk or folder’s contents, and each icon within the window represents a file or folder stored within that disk or folder. When you open a disk or folder, what you actually see is part or all of the disk’s directory or table of contents. Depending on its size and contents, a window can contain anywhere from no files to thousands of files. The information bar can give you the exact number.

Information Bar

At the top of each window, just below the title bar, is a band of statistics known as the information bar. Among other things, it can display the number of icons, called items, contained in the total window. You can use this number to determine if all the icons are visible in the window. Figure 5.12 shows a window with no hidden icons. The information bar lists three items; there are three icons visible in the window. The white horizontal and vertical scroll bars indicate that no icons are hiding in either plane.

If a window contains more than a few files, however, it won’t be able to display all its icons simultaneously. Figure 5.13 shows a window with four whole and
two partial icons visible, yet the information bar reports that the window contains fifteen items. In a case like the one shown in Figure 5.13, you can use the zoom box, the size box, or the scroll bars to see hidden icons.

**Zoom Box**

The zoom box, located in the upper-right corner, toggles between the window’s current size and its optimum size. If a window is relatively small, and there are few hidden icons, a click of the zoom box expands the window just enough to display all its icons. If a window contains too many icons to display on your screen all at once, the zoom box will expand its window to fill the entire screen except for the alley for the disk and Trash icons. A second click of the zoom box will toggle the window back to its original size and location.

**Size Box**

The size box, located in a window’s lower-right corner, resizes a window. Drag the size box to make the window larger or smaller. Its outline will follow the pointer. When you let go of the mouse, the window will resize accordingly. The Finder updates the Desktop file to record the window’s new size when the window is closed and reopened, even between computer sessions.
Scroll Bars

*Scroll bars* do not change a window’s size; instead, they change the icons that you see inside the window. In combination, the horizontal and vertical scroll bars tell you if all the icons are visible, and also tell you which direction to scroll for the hidden icons. Figure 5.13 demonstrates the visual difference between active and inactive scroll bars. An *active scroll bar*, gray with its scroll box showing, indicates that there are icons hidden in the plane that it scrolls. An *inactive scroll bar* indicates there are no items hiding in its direction. If both scroll bars are inactive, as in Figure 5.12, all its icons are completely visible and none are hidden.

**GUIDED ACTIVITY 5.2**

*Window Manipulation*

Guided Activity 5.2 shows you different ways to manipulate a Desktop window. You will use the zoom box, size box, and scroll bars to change window size and display. Begin at the Desktop with all windows closed.

1. Insert and open the Data Disk. Observe its window’s size and location on the Desktop.

2. Drag the Data Disk window to the upper-left corner of the screen. Dragging a window by its title bar moves the entire window.
   a. Press the Data Disk title bar anywhere except in the close box or zoom box (as in Figure 5.14).
   
   ![Figure 5.14](image)

   Press the title bar

   3 items 290K in disk 484K available

   b. Drag the window by its title bar up and left. As in Figure 5.15, the window’s outline moves with the pointer to show the new window location.

   **NOTE** If the outline vanishes before you release the mouse button, you tried to move the window somewhere it cannot go. Release the mouse button and start again.

   c. Release the mouse button. The window will move to fill its outline.

3. Open the West Student Data folder window. Now you have two open windows.

4. Zoom the West Student Data window in and out.
   a. Click the zoom box (upper-right corner) to expand the window, or *zoom out*. The zoom box makes the window just large enough to see all the icons in the West Student Data window. The large window completely covers the Data Disk window. Observe the white, inactive horizontal and vertical scroll bars.
b. Click the zoom box again. The window will return to its original size and location, or zoom in.

**NOTE** If you accidentally double-click the zoom box, the window will zoom out and in rapidly.

c. Zoom out. The window will expand to optimal size.

d. Zoom in a final time to end with the smaller window.

5. Drag the West Student Data window below the Data Disk window so that they no longer overlap.
6. Test your mouse and window control.
   a. Move the Data Disk window nearly off-screen below the Trash icon.
      The Macintosh prevents you from moving a window entirely off-screen.
      You must leave a tiny bit of the title bar showing, or the window outline
      vanishes and the window will not move.
   b. Move the window back to its original position. Take care to avoid the close
      box as you move the window back on screen.

7. Reduce the height of the West Student Data window so that it only displays
   one row of icons.
   a. Locate the size box in the lower-right corner of the window.
   b. Drag the size box up as in Figure 5.17 until the window outline includes
      only the upper icons, and release. (The window’s minimum height may
      require that you also display the tops of the second row of icons.)

   ![Figure 5.17: Shrink a window](image)

   The window will shrink and the vertical scroll bar will become active to
   show that there are hidden icons.

8. Scroll down to see the hidden icons.
   a. Click the down arrow as shown in Figure 5.18.

   ![Figure 5.18: Scroll down](image)

   The window icons will move up slightly so that you can see the tops of the
   lower ones.
b. Click the up arrow to return to the top of the window.

c. Click the gray scroll bar below the scroll box. You will be able to see roughly the next window screen (page) of icons as in Figure 5.18.

d. Click the scroll bar above the scroll box to return to the top of the window.

e. Drag the scroll box to the bottom of the scroll bar to see the bottom of the window.

f. With the size box, stretch the window until you can see all the icons and both scroll bars turn white.

9. Adjust steps 7 and 8 to practice horizontal scrolling.

a. Reduce the width of the West Student Data window to about half as in Figure 5.19. The horizontal scroll bar will activate.

b. Use the horizontal scroll bar, box, and right and left arrow to see different parts of the window.

c. Zoom to optimal size when you are done.

10. Close all open windows.

---

**Multiple Windows**

As you work, your desk often becomes covered with papers and folders. Likewise, the Macintosh Desktop can become covered with open windows. Yet, only one of these windows may be *active*, or capable of modification, at any given time; all the others are *inactive*. The *active window* looks different from the others so that you can distinguish it.
The Active Window

Only the active window displays its close, zoom, and size boxes, its scroll bars, and has a striped title bar. Figure 5.20 shows the differences between an active and an inactive window.

To activate a window, click anywhere on it. If another window had been active, it will deactivate. To deactivate a window, click either on another window or in the patterned or colored area of the Desktop. When a window becomes active, it comes to the front of the screen. As it comes forward, it may cover other, inactive windows. The hidden windows stay where they are; you just can’t see them.

GUIDED ACTIVITY 5.3

Manipulating Two Windows

Guided Activity 5.3 begins at the Desktop with the Data Disk mounted and all its windows closed. You will open its window, and toggle between its active and inactive state. Then you will open the West Student Data folder, and manipulate two windows.

1. Open the Data Disk. Its window is active. Look for the landmarks: window boxes, defined scroll bars, and striped title bar.

2. Click on the Desktop workspace. The Data Disk window will deactivate. Notice the changes.

3. Click the Data Disk window to re-activate it. Notice the changes in its appearance.

4. Open the West Student Data folder. The West Student Data window is active; the Data Disk’s window is inactive.

5. Drag the Data Disk window so that it partly covers the West Student Data window.

6. Click the West Student Data window to activate it and bring it to the front. The active West Student Data window will partly cover the Data Disk window.

7. Close both windows simultaneously with the Option close shortcut.
a. Hold down the Option key (next to ♯).

b. Click the close box of the active window (West Student Data) and release Option. Both windows close. Option close closes all open windows simultaneously. It’s a nice shortcut.

8. Reopen the Data Disk and West Student Data icons. The windows remember their sizes and locations. That’s because the invisible Desktop file keeps window statistics. (However, if a disk is locked, the Finder can’t update that disk’s Desktop file.)

9. Use Option click to close both windows.

10. Option open the West Student Data folder. If you hold down the Option key while you open a folder, the folder opens while the window that contained the folder closes. Option open keeps your Desktop uncluttered.
   
a. Open the Data Disk icon to display its window.
   
b. Hold down Option.
   
c. Double-click the West Student Data folder to open it. The Data Disk window will close.

11. Close the West Student Data window.

_________

Summary

Unit 5 has shown you how the Finder application records and remembers the names, kinds, sizes, locations, and windows of each file and folder on a disk in its invisible Desktop file. Each storage unit (a disk, a file, or a folder) is represented by a Desktop icon. Each icon has three parts: its graphic, its name, and its window. Windows may be moved, scrolled, zoomed, resized, and formatted to display different parts of the Desktop file. You learned to recognize the generic disk, file, and folder icons, and some custom icons as well. Finally, you learned to rename icons, activate and deactivate their windows, and manipulate their size, screen location, and icon display.

_________

Command Review

You should now know these Desktop commands.

File/Get Info Displays an icon’s informational window.

Zoom Click the zoom box.
Expands a window to its optimal size. A toggle.

Scroll down Click or press the vertical scroll bar’s down arrow, drag the vertical scroll box down, or click the gray scroll bar below the scroll box. These are different ways to view icons below the current window view.
Scroll up Click or press the vertical scroll bar’s up arrow, drag the vertical scroll box up, or click the gray scroll bar above the scroll box. These are different ways to view icons above the current window view.

Scroll left Click or press the horizontal scroll bar’s left arrow, drag the horizontal scroll box left, or click the gray scroll bar to the left of the scroll box. These are different ways to view icons to the left of the current window view.

Scroll right Click or press the right arrow, drag the horizontal scroll box right, or click the gray scroll bar to the right of the scroll box. These are different ways to view icons to the right of the current window view.

Option close Press the [Option] key and then click the active window’s close box. Closes all open Desktop windows simultaneously.

Option open Press the [Option] key while you open a folder. The window containing the folder will close while the folder window opens.

Exercises

Explore the icons on your hard disk. Most hard disks make extensive use of folders. Open folder windows to see other types of icons. Use File/Get Info to help you identify custom icons. When you are done, [Option] close to close all the open windows simultaneously.

1. Identify these icons and write their names in the blanks provided.

   a. Two folders

      ____________________________________________  ____________________________________________

   b. Two applications

      ____________________________________________  ____________________________________________

   c. Two documents

      ____________________________________________  ____________________________________________
Review Questions

Multiple Choice

1. The Finder application is part of the system software. It creates the workspace called the
   a. Desktop
   b. system
   c. File folder
   d. icon

2. The Finder is so named because it lets you
   a. hunt for your lost floppy disks
   b. find, move, open, close and delete files and folders
   c. connect the computer to the hardware
   d. find the printer

3. Which of these is not a generic icon?
   a. ![Folder Icon]
   b. ![Application Icon]
   c. ![Network Icon]
   d. ![Document Icon]

4. You can recognize the active window on the Desktop by
   a. stripes in the title bar, scroll bars, and scroll boxes
   b. its size
   c. its location
   d. its icons
5. Which of these can change a window's size?
   a. the size box only
   b. the zoom box and size box
   c. the zoom box, size box, and scroll arrows
   d. the zoom box, size box, close box, and scroll arrows

**True or False**

1. __ Only hard disks need Desktop files.
2. __ An icon consists of three parts: its name, its graphic, and its window.
3. __ Disk and folder windows are directories of their contents.
4. __ Most applications have custom icons.
5. __ You should always use ALL CAPS for icon names; otherwise the Macintosh cannot read the name.

**Fill In The Blanks**

1. Fill in the blanks with the number that matches the window part.

![Figure 5.21: Label the window parts](image)

```
   14 13 12 11 10
f.  __ Folder icon
j.  __ Document icon

   5 4 3 2 1
a.  __ Size box
```

```
   9 8 7 6
b.  __ Information bar
h.  __ Close box
i.  __ Up scroll arrow
k.  __ Zoom box
l.  __ Horizontal scroll bar
```

```
   15 16 17
```

c.  __ Window's name

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   17
```

d.  __ Scroll box

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e.  __ Title bar

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g.  __ Application icon

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2. Answer the following questions about the window displayed in Figure 5.21.
   a. How many of the window’s icons are hidden?
   b. Which scroll bar is active?
   c. Which scroll bar is inactive?
   d. Which scroll arrow would you click to see the hidden icons?
   e. Which icon is active?

Key Terms

Active
Active scroll bar
Active window
Case sensitive
Colon
Custom icon
Desktop
Desktop file
Desktop window
Directory
Finder
Folder
Generic icon
Icon
Icon’s name
Inactive
Inactive scroll bar
Information bar
Item
Kind
Option close
Option open
Scroll bars
Size
Size box
Storage icon
Trash
Truncated
Where
Zoom box
Zoom in
Zoom out
PART TWO

More than half of all personal computers today are used primarily for word processing. Part II teaches you to use the Macintosh computer as a sophisticated tool to type, to manipulate, and to change the presentation of written documents, such as letters, papers, memos, and reports—and to enhance your documents with graphics. Table II.1 summarizes the advantages of word processing over manual typing. By the completion of Part II, you will have experienced each of these advantages first-hand.

Units 6 through 8 demonstrate the time-saving advantages of the basic word processing steps—entering text, editing text, formatting text, saving work, and printing the document. As you format text, you will learn to vary the appearance of individual characters, alter text placement on the printed page, and change the position of individual paragraphs relative to the overall document.

Unit 6, "Word Processing Basics," shows you how to alter the way in which text is displayed and printed. By the end of Unit 6, you will be able to format characters by changing their size, style, position, and design.

Unit 7, "Page Design and Accuracy," teaches you to work with multiple-page documents. By the end of Unit 7, you will be able to set document parameters to control page size, orientation, and margin width. You will navigate with precision through a document's text area, moving from one screen page to another. You will
<table>
<thead>
<tr>
<th></th>
<th><strong>MANUAL TYPEWRITER</strong></th>
<th><strong>WORD PROCESSOR</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typing skill</strong></td>
<td>Accurate typing required to create neat, professional documents</td>
<td>Poor typists can create neat, professional documents</td>
</tr>
<tr>
<td><strong>Printing</strong></td>
<td>Printing occurs as you type</td>
<td>Text appears on screen, but printing occurs only by command</td>
</tr>
<tr>
<td>** Corrections**</td>
<td>Difficult and/or messy to fix mistakes. Requires White Out, correction tape, or typewriter erasers</td>
<td>Mistakes easily fixed on screen before they are printed</td>
</tr>
<tr>
<td>** Edit**</td>
<td>Must retype to rearrange or alter changing more than single words</td>
<td>Words, paragraphs, and larger sections of text are easily changed or rearranged</td>
</tr>
<tr>
<td>** Word wrap**</td>
<td>A manual carriage return must be executed at the end of each line</td>
<td>Text automatically wraps to the next line; manual return starts a new paragraph</td>
</tr>
<tr>
<td>** Additional drafts**</td>
<td>Each &quot;original&quot; must be retyped</td>
<td>Original work is saved to disk; print each &quot;original&quot; with a single command</td>
</tr>
<tr>
<td>** Repeated characters**</td>
<td>Click the key repeatedly</td>
<td>So long as a key is depressed, it continues to enter the same character</td>
</tr>
<tr>
<td>** Type style/size**</td>
<td>Hardware must be changed to change type size/style; few options</td>
<td>Type size/style changed with software commands, many options</td>
</tr>
<tr>
<td>** Underline**</td>
<td>Backspace and type lines under characters; single underline only</td>
<td>Select and underline by command; different underlining styles possible</td>
</tr>
<tr>
<td>** Caps Lock on**</td>
<td>Number keys produce symbols</td>
<td>Number keys produce numbers; shift key creates symbols</td>
</tr>
<tr>
<td>** Center text**</td>
<td>Count characters, divide by two, etc.</td>
<td>Centered with a simple command</td>
</tr>
<tr>
<td>** Graphics**</td>
<td>Must paste or tape to page; draw to change</td>
<td>Included in on-screen and printed document; easily manipulated and edited</td>
</tr>
<tr>
<td>** Spelling**</td>
<td>User identifies potentially misspelled words, looks up in dictionary</td>
<td>Computer compares every word in document to an on-line dictionary</td>
</tr>
</tbody>
</table>
use the on-line spell checker, date and number each page automatically, and screen preview a document before it is printed.

Unit 8, "Paragraphs," shows you how to format paragraphs. By the end of Unit 8, you will be able to select individual and multiple paragraphs to set their line space, alignment, and indentation.

Units 9 and 10 move beyond the basic word processing steps to demonstrate more advantages of word processing over simple typing.

Unit 9, "Graphics," shows you how to create and use computer art, and to add graphics to your text. By the end of Unit 9, you will be able to create and edit graphics and incorporate them into word processing documents. You will also know how to use the Scrapbook desk accessory to store frequently used graphic images.

Unit 10, "Expanding Your Word Processing Skills," illustrates the practical value of the Macintosh's consistent user interface in learning to use unfamiliar software. This unit applies the word processing steps you learned in Units 6 through 9 to Microsoft Works 3.0 and ClarisWorks 2.0. By the end of Unit 10, you will be proficient in using the Macintosh to produce professional and typographically correct papers and reports that include both text and graphics.
Word processing programs let you enter, edit, and format text. Unit 3 showed you how to enter and edit text. Unit 6 teaches you how to change the form of characters and words. You will use on-line help to learn formatting commands, and will use time-saving shortcuts to compute more efficiently. Finally, you will develop strategies to help you design attractive documents.

Learning Objectives

At the completion of this unit you should know

1. the advantages of word processing over typing,
2. various character format options: font, size, style, and position,
3. that the Toolbar, the Ruler, and the Ribbon contain command buttons that make it easy to format text in MS Word,
4. the purpose and limitations of the Clipboard,
5. the basic Edit menu commands: Undo, Cut, Copy, Paste, Clear—and the relationship of each to the Clipboard,
6. that the keyboard is often faster than the mouse, and that many menu commands have keyboard equivalents,
7. the relationship between content and format.
At the completion of this unit you should be able to
1. display and hide the Toolbar, Ruler, and Ribbon,
2. use MS Word’s Balloon Help and Microsoft Word Help,
3. use the Ribbon to format characters and words,
4. view the Clipboard,
5. use basic Edit menu commands to delete, copy, and move text,
6. look up and use basic keyboard equivalents.

What is Character Formatting?

A character is an individual number, letter, or special symbol that you enter from the keyboard. The Macintosh gives you many ways to change the form of characters and words both on-screen and on paper. A character’s appearance is known as its format, and the process of determining that form is called character formatting. Figure 6.1 shows some examples of character formatting of the word “Word.”

<table>
<thead>
<tr>
<th>Word</th>
<th>Word</th>
<th>Word</th>
<th>Word</th>
<th>Word</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word</td>
<td>Word</td>
<td>Word</td>
<td><em>□□</em></td>
<td>Word</td>
<td>Ωόδβ</td>
</tr>
<tr>
<td>Word</td>
<td>Word</td>
<td>Word</td>
<td>Word</td>
<td>Word</td>
<td>W Ord</td>
</tr>
</tbody>
</table>

Buttons

It can be hard to remember the commands for such a wide variety of character formats. The Macintosh uses on-screen buttons in dialog boxes, such as OK and Cancel; MS Word helps both the new and the experienced user by providing on-screen word processing command buttons. Each square or rectangular button represents a commonly used command; its command is symbolized by its button icon, such as the boldfaced letter B on the bold button.

To execute a command, click its on-screen button. You will find buttons in three areas or button strips on the MS Word window: the Ruler, the Ribbon and the Toolbar.

The three button strips are arranged by function. The Ribbon contains buttons that format characters. The Ruler contains buttons that format paragraphs (see Unit 8). The Toolbar contains a collection of personalized buttons that will not be covered in this text.
Hiding and Displaying Button Strips

Your window may not look exactly like the one in Figure 6.2. MS Word permits you to display or hide each button strip and to vary the Toolbar’s position and buttons. Initially, you may find three button strips distracting. You may wish to hide two of them, displaying only the Ribbon and its character formatting buttons.

GUIDED ACTIVITY 6.1

Hiding and Displaying MS Word Button Strips

Guided Activity 6.1 shows you how to hide and display the Ruler, the Toolbar, and Ribbon. You will open MS Word, identify each button strip, and hide and display it. You will finish with only the Ribbon displayed. Leave MS Word open for Guided Activity 6.2.

1. Open MS Word.
2. Locate the Ruler, the Ribbon, and the Toolbar with the help of Figure 6.2. Don’t worry if one or more button strips are not visible. You will learn to display them shortly.
3. Press the View menu title to see the View menu (Figure 6.3).

The Ribbon and Ruler commands display a check mark, ✓, to the left of their names only when the corresponding button strip is visible. Each command is a toggle.

The Toolbar command works the same way, except that no check mark appears on the menu when the Toolbar is visible.
NOTE  Microsoft has violated rule four of Apple's Ten Interface Commandments, "Thou shalt be consistent." Fix it next time, Microsoft!

4. Choose View/Ribbon to hide the Ribbon.
5. Choose View/Ribbon again to display it.
6. Choose View/Toolbar to hide the Toolbar.
7. Choose View/Ruler to hide the Ruler. You should finish with only the Ribbon displayed and your screen should resemble Figure 6.4.

Getting Help

All these buttons might seem a little overwhelming. How will you remember the names of all these buttons, much less figure out how to use them? Fortunately, the Macintosh offers on-screen help.

The Help Menu

Any time that you are struggling with a particular command or forget the name or function of an on-screen landmark, pull-down the Help menu. The Help menu, titled by its cartoon balloon question mark icon, is located on the right side of the menu bar.

The Macintosh’s operating system software provides Balloon Help for basic menu commands and on-screen landmarks. In addition, individual software programs often provide application-specific help options. For this reason, your Help menu will change, depending on the applications you are currently using.
MS Word provides two kinds of help: *Microsoft Word Help* and *Balloon Help*. Figure 6.5 shows the Microsoft Word Help menu.

**Microsoft Word Help**

Microsoft Word Help displays an information box that is actually a table of contents. You select a topic from a long alphabetical list of MS Word commands and functions, click Help, and then read detailed information about your selected topic. (Double-clicking on your topic does the same thing.) Figure 6.6 shows the progression.

After you read your topic, click Topics to return to the Help topic list. When you are done getting help, click Cancel.

**Balloon Help**

Balloon Help provides on-the-spot cartoon balloons to describe screen features and menu commands. You turn on Balloon Help when you need it, and turn it off the rest of the time to keep the balloons out of your way. Balloon Help does not identify everything on your screen; you will have to find the areas where it works. MS Word’s Balloon Help displays a balloon for each on-screen button and nearly every pull-down menu command.

Once you choose Help/Show Balloons, an on-screen balloon automatically appears whenever you point to an on-screen landmark or menu.
command that has a balloon associated with it. There is no need to click or do anything else to see the balloons. Figure 6.7 shows the Help menu title balloon.

When you tire of seeing balloons, choose Help/Hide Balloons to turn them off.

**GUIDED ACTIVITY 6.2**

**Balloon Help**

Guided Activity 6.2 continues from Guided Activity 6.1. You will turn on Balloon Help, point to different Ribbon buttons to learn their functions, and then turn Balloon Help off.

1. Choose Help/About Balloon Help. Help/About Balloon Help displays the dialog box shown in Figure 6.8.

![Figure 6.8: About Balloon Help](image)

### About Balloon Help...

Use Balloon Help to learn about items on your screen.

To use Balloon Help, choose Show Balloons from the ? menu. Then point to items on screen to see help balloons about them.

**OK**

2. Read the dialog box and then click OK.

3. Choose Help/Show Balloons to activate the balloons. When the balloons are active, the menu changes to Hide Balloons. The menu toggles between Show Balloons and Hide Balloons as shown in Figure 6.9.

![Figure 6.9: Help menu](image)

4. Point to each object in the Ribbon and read its balloon. Do not press the mouse button. When you point to the Ribbon’s Font box, you will read the balloon in Figure 6.10.
Figure 6.10 shows some of the Ribbon’s character format buttons you might identify.

| Font box balloon |

5. Choose Help/Hide Balloons to turn them off.
6. Quit MS Word.

Character Format Choices

Your Balloon Help tour of the MS Word Ribbon has shown you a variety of ways in which characters may be formatted. Let us examine each of these choices in turn.

Font

A font is a named set of characters of distinct design. (What Macintosh menus call fonts are actually typefaces. A font consists of all the typeface characters of a single size and type style. Most people use the terms interchangeably.) There are thousands of different Macintosh fonts, so your computer system probably has a different list than the examples in this book. Apple’s System 7 software includes the fonts shown in Figure 6.12.

The Font box displays the name of the currently selected font. Any text you enter will appear in that design. If you press the ▼ arrow to the right of the box, a pop-up menu of available fonts will appear. Apple Computer, Inc. distinguishes between drop-down menus that drop down from the Menu bar and pop-up menus that appear from any other location. Following this distinction, the pop-up Font menu drops down a list of font choices. Semantics! The currently selected font, Times in Figure 6.12, has a check mark ✓ next to its name. When you drag down the menu to choose a different font, that font becomes selected and its name appears in the font box.
Type Size

Fonts come in different sizes, based on a typographical measurement called the point. Each point is \( \frac{1}{72} \) of an inch. A twelve-point font would be \( \frac{1}{6} \) of an inch from top to bottom. The ribbon’s Size box, shown in Figure 6.13, works the same way as the Font box.

Type Style

Type style designates whether the characters are plain, bold, italicized, underlined, or otherwise stylized.

When a type style button is highlighted, that style is selected. Characters may have more than one type style. This sentence is bolded, italicized, and underlined.
Position

*Position* describes the placement of characters on, above (*superscript*) or below (*subscript*) the main line of text. A chemical formula such as H$_2$O has a **subscript** $\text{2}$. First place, abbreviated as 1st place, has a **superscript** $\text{st}$. Each character can maintain only one position at any given time.

The Ribbon as an Indicator

Not only can you use the ribbon to change text format, but also to show the existing format. If you move your insertion point to different formatted parts of your document, the Ribbon settings change. These settings provide a quick formatting reference.

Sometimes a block of text is not formatted uniformly. The text block might have one underlined word, with only a single subscripted character, such as H$_2$O. When that happens, a **gray Ribbon button** is displayed. When H$_2$O is selected, the Ribbon looks like Figure 6.14.

---

**Figure 6.14**
The Ribbon display of H$_2$O

---

GUIDED ACTIVITY 6.3

Using the Ribbon to Format Characters

In Guided Activity 6.3, you will format the text of the Congratulations document. You will select text and click Ribbon buttons to change characters’ font, type size, type style, and position. Afterwards, you will move your insertion point to different locations and observe the Ribbon settings.

1. Open the Congratulations document. It is inside the West Student Data folder of your Data Disk.

2. Format the word Congratulations to 18 points.
   a. Select the word Congratulations.
   b. Press the size arrow to make the size list drop down.
   c. Drag down to 18 points and release.

3. Bold the phrase Congratulations, YOUR NAME.
   a. Select the phrase Congratulations, YOUR NAME.
   b. Click the bold type style button.
4. Italicize the word many.
   a. Double-click on the word many to select it plus the space immediately following. Double-clicking is a shortcut for single word selection; it is faster and more accurate than dragging.
   b. Click the italics type style button.

5. Format the word Regrets to 9 points, subscripted.
   a. Select the word Regrets.
   b. Choose 9 points from the size menu.
   c. With Regrets still selected, click the subscript button.

6. Underline the words word processor.
   a. Select the words word processor.
   b. Click the underline type style button.

7. Select the word TYPEWRITER and change its font to Courier. With all the changes, your document should resemble Figure 6.15. The a–f positions are for step 8.

8. Use the Ribbon as a format indicator.
   a. Move the insertion point to position A in Figure 6.15 and observe the Ribbon. The bold button should be highlighted, and the Size box should display 18 points.
   b. One at a time, move the insertion point to positions b through f and observe the Ribbon settings. Examine font, size, style, and position.
   c. Select a block of text with nonuniform formatting and observe the gray buttons in the ruler.

9. File/Save As your changed document to your Data Disk. Name it Congrats 2. Use File/Save As whenever you want to name and store a second version of a file, leaving the original unchanged.
a. Choose File/Save As to display the Save As dialog box, Figure 6.16.

![Save As dialog box](image)

b. In the box below, Save Current Document as:, type Congrats 2.

c. Click Save. Congrats 2 will replace Congratulations in your document's title bar. You are now working on the new file, Congrats 2.

10. Quit MS Word.

11. Shut Down. Guided Activity 6.4 begins with the computer turned off.

**Edit Menu Shortcuts**

The Edit menu contains a series of shortcut commands that make it easy to reverse mistakes and to move large blocks of data within and between applications. Whether you are at the Desktop or inside an application, you will find most or all of the commands in Figure 6.17 in the Edit menu.

![Edit menu commands](image)

Individual applications may add to or modify the Edit menu command list. MS Word, for example, allows the user to customize the commands that appear under each menu title. Figure 6.18 shows a customized MS Word Edit menu.

Learning to use the standard Edit menu commands will simplify your work.
# Edit/Undo

*Undo* is almost always the first command under the Edit menu. It gives you a second chance when you make a mistake. Virtually every Macintosh application has an Undo command. Whenever you change a document or choose a command, the computer remembers that action until you perform another one. Undo is catastrophe insurance; it can restore your document to the state that it was in just before you gave the last command or initiated the last action. If you make a mistake or change your mind, Undo can keep you from having to retype or reformat copy, or to repeat actions.

**NOTE** *Undo reverses only your very last action. The computer—not you—determines what constituted that very last action. Therefore, Undo may not always give you the results you expect.*

Different applications have different Undo capabilities. MS Word’s Undo is very comprehensive. When you pull-down the Edit menu, MS Word expands the Undo command to let you see what kind of action the computer determines as your last action. Moreover, if Undo doesn’t do what you had hoped, you can always toggle to Redo. Figure 6.19 shows the progression.
You have already used Undo to restore deleted text blocks so you didn’t have to retype them. Let us examine what is actually happening.

Whenever it is used, the Macintosh automatically keeps a RAM record of both what you are currently doing, and also your previous action or two. When you select Undo, the computer examines that record and uses it to reverse your last command or action whenever possible. Undo’s recordkeeping operates in the background; you can’t view the Mac’s record of your actions. Often, you can’t be sure what that last step was until you actually Undo it and see the results.

Some actions are not “Undo-able.” Most menu items and typing sequences are Undo-able. In general, operations that do not affect the content of a document, such as selection, scrolling, or changing a window’s size or location, are not Undo-able. Even MS Word cannot “UnSave” a Saved document. If you cannot Undo an action, the Undo menu choice will be gray, which lets you know it cannot be selected at that time.

The Clipboard

The three most universal Edit menu commands below Undo are Cut, Copy, and Paste. They depend on a special place in memory called the Clipboard. The Clipboard holds whatever you Cut or Copy from a document temporarily until you are ready to Paste it somewhere else. It was named the Clipboard because it is a holding place.

HOW DOES THE CLIPBOARD WORK?

Since the Clipboard holds its contents in RAM, each time you turn on your computer, the Clipboard is empty. The Clipboard stays empty until you Cut or Copy something to it. Once something is placed in the Clipboard, it stays there even if you change documents, open another program, or quit an application.

HOW MUCH CAN THE CLIPBOARD HOLD?

The Clipboard can only hold one thing at a time. Each time that you Cut or Copy something, it replaces the previous Clipboard contents. The previous contents are kept electronically, however, in case you decide to Undo the Cut or Copy. Look at the icon of the software that controls the Clipboard. It only contains one item!

Although the Clipboard can only hold one piece of information at a time, that piece can be very large. The actual size depends upon the amount of free RAM in your system. In some systems, it is possible to copy and paste more than twenty pages of text and graphics from one document to another. If you try to
Cut or Copy something that is too large for your memory, the computer will give you an error message such as: “There is not enough memory to perform that operation.”

**CAN YOU SEE THE CLIPBOARD?**

Sometimes, depending upon the application you are using, you can see the Clipboard. At the Desktop, Edit/Show Clipboard displays the Clipboard window. The Desktop Clipboard window displays its contents and tells you the kind of data it holds. Two examples are shown in Figure 6.20. (Remember, you could not have both of these Clipboards at the same time.)

Some applications allow you to view the Clipboard, and others do not. MS Word can display the Clipboard, but not identify its content type. Compare Figure 6.20 with Figure 6.21 to see the distinction.

**GUIDED ACTIVITY 6.4**

**Viewing the Empty Clipboard**

Guided Activity 6.4 begins with the computer turned off. You will start up the computer and view the empty Clipboard at the Desktop. In Guided Activity 6.5, you will place something in the Clipboard and view the Clipboard again.

1. Turn on your computer system.
2. Click the Desktop workspace to deselect all icons.
3. Press Edit to view the Desktop’s Edit menu.
Notice that Undo, Cut, Copy, Paste, and Clear are all gray (as in Figure 6.22), showing they may not be used at this time. Be sure you understand why this is the case.

4. Choose Edit/Show Clipboard to show the empty Clipboard window (as in Figure 6.23).

5. Click the Clipboard’s close box to close its window.

**Edit/Cut**

*Cut* deletes a selected block of text or a graphic from a document and places it into the Clipboard. You can use this command either to delete the selection or to move it. To move the selection, you will need to use the Paste command to place it into its new location.

When the power goes off, however, the Clipboard empties. It doesn’t distinguish between a Shut Down and a power failure. For this reason, you should always Save before you Cut, especially if you are cutting out something large.

**Edit/Clear**

The menu command Edit/Clear has the same effect on a text block as using the delete/backspace key. Clear differs from Cut in that Clear does not place the passage into the Clipboard. Therefore, it does not displace whatever else may be there. To save RAM, use either the delete/backspace key or Clear rather than Cut to remove something from a document unless the item will be moved.
GU IDE D ACT I V IT Y 6 . 5

Using the Edit Menu

Guided Activity 6.5 continues from Guided Activity 6.4. You will open the second try document on your Data Disk and use Edit menu commands to relocate and copy text blocks. As you choose different commands, you will view the Clipboard to see what it contains.

1. Insert your disk and open second try.
2. Hide the Ruler and Toolbar.
3. Carefully edit the document to correct any mistakes. The finished document should resemble Figure 6.24.

File/Save replaces your previously-saved document with what is currently on-screen. The pointer turns into a watch while saving, but no dialog box appears.

5. Format the author’s name.
   b. Bold his name and change the size to 14 points.

6. Choose Edit/Undo Formatting. As you work, MS Word adjusts its Undo command, to help you remember your last step.

Note that the text block remains boldface, but the point size reverts to 12 points, since the point size change was your very last step.
7. Choose Edit/Redo Formatting.

After you choose an Undo command, MS Word adjusts the menu to allow you to Redo your Undo. Not all applications have such a dynamic Edit menu.

Now the point size returns to 14 points.

8. Select the entire document and change it to 36 points.
   a. Choose Edit/Select All. This command provides an easy way to highlight an entire document. Even if the document were longer, Select All would still highlight the whole document and not just the part currently visible in the window.
   b. Change the point size to 24 points.

9. Choose Window/Show Clipboard. The Clipboard is still empty.

10. Cut the entire document onto the Clipboard.
   a. Choose Window/second try to activate your document window and move it on top of the Clipboard window.
   b. Choose File/Save. Always save before you Cut.
   c. Choose Edit/Cut. Your document is now blank; it has been cut to the Clipboard.
   d. Choose Window/Show Clipboard to activate the Clipboard window. Your formatted passage is in the Clipboard, as in Figure 6.25.

   ![The computer is by all odds the most extraordinary of the](image)

The Clipboard window has scroll bars. You can scroll to see its hidden contents, but you cannot highlight or edit what the Clipboard contains.

e. Choose Window/second try.
11. Choose Edit/Undo Cut. The text is restored to the document window, and the Clipboard empties.

   a. Reduce all text to 14 points to make your work easier.
   b. Select Marshall McLuhan. Be sure to select beyond the n to include the hidden paragraph mark, the invisible character that occurs whenever you press the (Return) key.

   ![Hidden paragraph mark](image)

   c. Choose Edit/Cut.
   d. Examine the Clipboard window and return to your document window.
   e. Place the insertion point at the very beginning of the document.
   f. Choose Edit/Paste. The passage moves to the beginning of the document.

   ![Marshall McLuhan](image)

   If Marshall McLuhan and The are on the same line, you did not include the hidden paragraph mark in your selection. To correct this problem, place the insertion point after the n and press (Return).

13. Examine the Clipboard window and return to your document window. The Clipboard still contains Marshall McLuhan and will continue to do so until you either turn off the computer or Cut or Copy something else into the Clipboard.

   a. Place the insertion point at the end of the document and press (Return) twice.
   b. Type a capital letter 0.
   c. Format the capital 0 to 72 point, Avant Garde, bold to resemble a hula hoop.

   ![Correct selection](image)  ![Selection includes paragraph mark](image)
d. Select the formatted 0, but not the hidden paragraph mark to its right, and choose Edit/Copy. Copy places a replica of the selection into the Clipboard, but leaves the original intact.

e. Show the Clipboard. It should now contain only the formatted 0.

f. Return to second try.

g. Be sure your insertion point is at the end of the document, just to the right of the capital 0. Whatever you paste will appear at the blinking insertion point.

h. Choose Edit/Paste. You should now have two hula hoops next to each other.

Note If you have two Os on two different lines, you copied both the 0 and the hidden paragraph mark into the Clipboard. To remedy, place the insertion point to the left of the bottom 0 and press [Delete]. Then copy only the left 0 into the clipboard.

15. Choose Edit/Paste again. Now you have three hula hoops. You didn’t have to Copy before you pasted since the hula hoop was already in the Clipboard.

16. Choose File/Save to update your changes and leave the document open for the next Guided Activity.

Keyboard Shortcuts

Did you notice how much time elapsed as you worked your way through these Edit menu activities? Now that you understand these commands, the Macintosh provides faster ways to choose them. The last part of Unit 6 shows you how to use keyboard equivalents, keystroke combinations that replace pull-down menu commands.

Modifier Keys

You know what the regular or alphanumeric keys do when you press them; they type that letter or number. Macintosh keyboards also have four modifier keys: [⌘ Command], [⌥ Option], [_shift] Shift, and [_control] Control. These keys do nothing by themselves; in combination with other keys, they create keyboard equivalents.

Most commonly used for keyboard equivalents, the Command key (⌘) contains both the Apple symbol (⌘) and the cloverleaf Command symbol (⌘). The Command key is so named because it helps to issue commands. You will only use the [⌘] and [_shift] modifiers in this unit.
Looking Up the Equivalents

You have had the equivalents in front of you all the time, but you didn’t know it. They are displayed on each pull-down menu. Let’s begin with MS Word’s File menu.

Table 6.1 shows a chart of the File and Edit menu keyboard equivalents set by Apple.

Don’t be overwhelmed by the list. Apple tried to make the equivalents easy to learn and easy to execute. The File commands all use the first letter of the command itself. Some of the Edit commands are less intuitive, since the File menu had already used some letters, such as P for print. Undo—that most important command—has the Z right next to the Command key on the left side of the keyboard,
making the combination easy to type. You can remember that Cut is \( \text{快捷键} X \) because to remove something is to “X” it out. \( \text{快捷键} C \) is intuitive, Copy starts with a C. \( \text{快捷键} V \) for Paste (\( \text{快捷键} V \) not \( \text{快捷键} U \)) is a little trickier. The \( \text{快捷键} V \) resembles an inverted caret, \( \text{快捷键} \), the copy editor’s symbol for insertion.

**How to Do It**

It can be difficult to press the keys that contribute to a keyboard equivalent *all at once*. If you type the alphanumeric character a split second before the modifier, the Macintosh will replace your selected text with that character rather than perform the desired menu command. (Don’t forget Undo!) When you execute keyboard equivalents, it is safer to press the modifier key, which does nothing by itself, and then keep it pressed while you type the appropriate alphanumeric key. Then, let go of the modifier keys.

**GUIDED ACTIVITY 6.6**

*Repeating Pastes from the Keyboard*

Guided Activity 6.6 continues from Guided Activity 6.5. It’s a quickie. When you are done, leave the document open for Guided Activity 6.7.

1. Type \( \text{快捷键} V \) to paste another hula hoop.
   a. Place the insertion point at the end of the document.
   b. Press the \( \text{快捷键} \) key and keep it down.
   c. Type the letter \( \text{快捷键} \) and remove your hands from the keyboard. The contents of the Clipboard will paste into your document.

2. Repeat step 1 two more times to paste more hula hoops. There are now six in a row.

3. Type \( \text{快捷键} S \) to update your changes.

4. Type \( \text{快捷键} P \) to print your document. When you reach the Print dialog box, press either Enter or Return to print the document.

Whenever a Macintosh dialog or alert box contains a button surrounded by a double border, you can press either Enter or Return as a keyboard equivalent for clicking that button with the mouse. Next, you will learn other time-saving keyboard equivalents that are specific to MS Word.

**Keyboard Equivalents within MS Word**

Each application uses its own keyboard equivalents. Sometimes they are shown on the pull-down menu. Other times they are not. Table 6.2 gives the MS Word keyboard equivalents for some of the character format commands you used on the Ribbon—and two extra character styles, shadow and outline. Many applications
besides MS Word use the same equivalents. You will use these shortcuts in the next few Guided Activities. On the Menu bar, the \( \text{Ctrl} \) symbol stands for the [Shift] key.

<table>
<thead>
<tr>
<th>TABLE 6.2</th>
<th>CHARACTER FORMAT</th>
<th>MENU BAR SYMBOLS</th>
<th>KEYSTROKES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bold</strong></td>
<td>#B</td>
<td>#B</td>
<td></td>
</tr>
<tr>
<td><strong>Underline</strong></td>
<td>#U</td>
<td>#U</td>
<td></td>
</tr>
<tr>
<td><strong>Italicize</strong></td>
<td>#I</td>
<td>#I</td>
<td></td>
</tr>
<tr>
<td><strong>Shadow</strong></td>
<td>##W</td>
<td>#Shift W</td>
<td></td>
</tr>
<tr>
<td><strong>Outline</strong></td>
<td>##D</td>
<td>#Shift D</td>
<td></td>
</tr>
</tbody>
</table>

**GUIDED ACTIVITY 6.7**

**Formatting with Word's Keyboard Equivalents**

Guided Activity 6.7 continues from Guided Activity 6.6. You will use keyboard equivalents to format, to save, to print, and to quit.

1. Select the entire document and change its font.
   a. Type \#A, Select All, to highlight the entire document.
   b. On the Ribbon, change the font to Bookman, if available on your system. If not, choose another font.

2. Select the last line and copy it.
   a. Triple-click anywhere within the last line. Triple-clicking is a quick way to select a whole paragraph in MS Word.
   b. Type \#C to copy the last line into the Clipboard.
   c. Click just to the right of the last 0 to set your insertion point at the end of the document.
   d. Press [Return].
   e. Press \#V to paste the Clipboard contents where the insertion point appears. You should now have two lines of hula hoops.

3. Format the hula hoops.
   a. Select the last two lines of the document. You may have to scroll up to view them in the document window.
   b. Type \#Shift W to shadow.
   c. Type \#Shift D to outline.
   d. Type \#I to italicize.
Each of these character format keyboard equivalents is a toggle. The first time an equivalent is pressed, it places the format; the second time it is pressed, the format is removed.

4. Type \Control{S} to save your work. (Always save before you print, remember?)

5. Type \Control{F} to print the document. When the Print dialog box appears, press Enter to print. Your completed document should resemble Figure 6.27.

6. Type \Control{Q} to Quit MS Word.

FIGURE 6.27
The completed second try document

Marshall McLuhan
The computer is by all odds the most extraordinary of the technological clothing ever devised by man, since it is an extension of our central nervous system. Beside it, the wheel is a mere hula hoop.

OOOOOOO

OOOOOOO

Formatting Tips

The Macintosh and MS Word provide so many character formatting options that it is tempting to go overboard and have a “Mac attack.” While it is fun to play with all the character options, do not forget that someone will eventually read what you have formatted. Figure 6.28 shows what can happen when character formatting is carried to an extreme. Notice how difficult it is to read.

FIGURE 6.28
Extreme character formatting

Congratulations, student. Together, you and your Mac are going to increase productivity in creating and manipulating text.

With so many choices, it is difficult to choose effectively. A good strategy is to focus on content. Type and Save your text, edit it for spelling and meaning, and Save it again. In this first phase, keep your hands on the keyboard as much as possible. Once you have perfected your content, let your message guide the format.

As you experiment with different fonts, remember to keep your fonts uniform. Unless you have a background in design and typography, do not use more than two fonts on the same page. Relate format to meaning: emphasize an important word, diminish one you wish to downplay. The purpose of character formatting is to enhance your message, not to lose it.
Summary

Unit 6 showed you many ways in which the Macintosh can alter text. First, you hid the MS Word Ruler and Toolbox and used on-line help to learn how to format characters. Then, you used the Ribbon to change character font, size, style, and position. You then moved the insertion point and referred to the Ribbon to remember how specific characters were formatted. Finally, you understood how character formatting should enhance rather than distract from your message.

You also learned to save time with Edit menu and keyboard equivalents. These shortcuts allowed you to perform basic Macintosh operations rapidly, such as opening, printing, and saving files. You easily copied and moved text blocks with the Edit menu, the Clipboard, and keyboard equivalents. Finally, you facilitated character formatting with keyboard shortcuts in MS Word.

To become a more efficient Macintosh user, use these shortcuts whenever possible.

Command Review

You should now know these Macintosh commands:

- **Bold**: Select text and either type `⌘ B` or click the Ribbon’s bold button.
- **Underline**: Select text and either type `⌘ U` or click the Ribbon’s underline button.
- **Italicize**: Select text and either type `⌘ I` or click the Ribbon’s italics button.
- **Save As**: Choose File/Save As. Names and creates a new file with contents of current one at the storage location you designate.
- **Save**: Type `⌘ S` or choose File/Save. Updates changes to a previously saved file.
- **View/Ribbon**: Toggles Ribbon between hide and display.
- **View/Ruler**: Toggles Ruler between hide and display.
- **View/Toolbar**: Toggles Toolbar between hide and display.
- **Help/Show Balloons**: Turns on Balloon Help.
- **Help/Hide Balloons**: Turns off Balloon Help. Show Balloons and Hide Balloons toggle.
- **Help/Microsoft Word Help**: Displays the Help dialog box.
- **Undo**: Choose Edit/Undo or type `⌘ Z`. Reverses your very last action.
Exercises

Practice character formatting and text editing. Your text may look different on screen if you use a font different from the printed version in the textbook. It's not a problem.

Open these files as you did in Unit 3. Save each document as its file name plus U6. Insert your name in the document after each selection. After you make the modifications, save and print your work.

1. Modify Walrus U3 to change type style and position.
   a. Italicize Alice in Wonderland and bold Lewis Carroll.
   b. Subscript Tweedledee and superscript Alice.
   c. Change all text to Zapf Chancery, 14 points. (Now it looks like a poem!)

2. Modify Shakespeare U3 to change type, to copy and paste text, to add blank lines, and to change type font and size.
   a. Italicize Written by and bold William Shakespeare.
      The words by and William will run together on screen, but will print correctly.

      Written by William

   b. Create a title for the first quote.
      i. Copy the first line of the first quote, All the world's a stage.
      ii. Move the insertion point to the beginning of the line and Paste to insert your title text.
      iii. Use the (Return) key to insert a blank line between the title line and the quote itself.
iv. Bold the title line, and capitalize the w and s. Enlarge the title to 18 points, and change its font to Helvetica.

v. Delete the comma at the end of the title, if necessary.

c. Create a title for the second quote.
   i. Copy the third line of the second quote,
      The course of true love never did run smooth.

   ii. Move the insertion point to the beginning of the first line of the second quote and Paste to insert your title text.

   iii. Separate the title from the rest of the quote with a blank line.

   iv. Bold the title line and capitalize the first letters of words that begin with the letters: c, t, l, n, d, r, and s. Enlarge the title to 18 points and change its font to Helvetica.

   v. Delete the comma at the end of the title, if necessary.

d. Add an extra blank line or two to separate the two quotes.

e. Increase the point size of the quotes themselves (not the source) from 12 to 14 points.

3. Modify Beginnings U3 to change type style and insert text.
   a. Italicize the title, which starts with The year 1971.

   b. Bold Paul Freiberger.

   c. Bold and underline the line: The Estimated Year-1971.

   d. Italicize the paragraph that begins with . . . But.

4. Modify Try Again to replace one selection with another.
   Replace each asterisk (*) with the repeated refrain: Try, try again!

   Tis a lesson you should heed, *
   becomes
   Tis a lesson you should heed, Try, try, again!

5. Have a "Mac attack." Create a new file and type an original short passage: quip, tongue twister, favorite rhyme. Use at least ten different character formats, not all on the same character(s).
Review Questions

Multiple Choice

1. In word processing, the term character is defined as
   a. a group of letters that form a word
   b. a set of type designs
   c. an individual number, letter, or special symbol
   d. a complex style sequence
2. The term font describes
   a. the name and size of characters
   b. a named set of characters of distinct design
   c. the position, size, and style of format
   d. an alphabetical listing
3. In the number $2^3$ the character $^3$ is an example of which formatting type?
   a. style
   b. size
   c. subscript
   d. superscript
4. If you catch a mistake during a Copy, Cut, and Paste sequence, which command reverses your most recent command or action?
   a. Clear
   b. Clipboard
   c. Undo
   d. Quit
5. You can command the computer by
   a. using the pull-down menus
   b. pressing combinations of keyboard keys
   c. sequencing mouse clicks
   d. all of these
**True or False**

1. __ The Help menu toggles between Help/Show Balloons and Help/Hide Balloons.

2. __ Undo is the same for all applications.

3. __ The Clipboard’s contents remain in RAM even after you quit the application.

4. __ Too many type styles on one page can distract from your message.

5. __ In MS Word, all character format options are represented by Ribbon buttons.

**Fill In the Blanks**

1. Look up and list the keyboard equivalents for these general Macintosh commands:
   
   a. Undo __
   
   b. Cut __
   
   c. Copy __
   
   d. Paste __
   
   e. Select All __
   
   f. Save __
   
   g. Open __
   
   h. Print __
   
   i. Quit __

2. Fill in the crossword puzzle shown in Figure 6.29.

**ACROSS**

5. To make text heavier or darker

6. Typographical measurement, ½ of an inch

7. Position characters above the line

9. Slanted type style

10. Another word for highlight

11. On-screen explanations and definitions

14. The command that replicates the Clipboard’s contents at the insertion point or highlight
DOWN

1. The command to replicate highlighted text into the Clipboard, leaving the original intact

2. To change the appearance of a character or word

3. To change a document’s characters and/or words

4. To draw a line under characters

7. To position characters below the line

8. To remove text from a document

12. A temporary holding place in memory

13. Random Access Memory

WORD LIST

<table>
<thead>
<tr>
<th>bold</th>
<th>format</th>
<th>RAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>clipboard</td>
<td>help</td>
<td>select</td>
</tr>
<tr>
<td>copy</td>
<td>italic</td>
<td>subscript</td>
</tr>
<tr>
<td>delete</td>
<td>paste</td>
<td>superscript</td>
</tr>
<tr>
<td>edit</td>
<td>point</td>
<td>underline</td>
</tr>
</tbody>
</table>
### Key Terms

<table>
<thead>
<tr>
<th>Balloon Help</th>
<th>Drop-down menu</th>
<th>Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Button strip</td>
<td>Font box</td>
<td>Position</td>
</tr>
<tr>
<td>Character</td>
<td>Format</td>
<td>Ruler</td>
</tr>
<tr>
<td>Character formatting</td>
<td>Gray ribbon button</td>
<td>Size box</td>
</tr>
<tr>
<td>Check mark</td>
<td>Help menu</td>
<td>Subscript</td>
</tr>
<tr>
<td>Clipboard</td>
<td>Keyboard equivalent</td>
<td>Superscript</td>
</tr>
<tr>
<td>Command key</td>
<td>Microsoft Word Help</td>
<td>Type style</td>
</tr>
<tr>
<td>Cut</td>
<td>On-screen help</td>
<td>Undo</td>
</tr>
</tbody>
</table>
It's fun to format short passages, but the real benefit of a computer is in preparing multiple-page documents or reports. Unit 7 shows you how this is done. To save you typing time, an unformatted report about computers awaits you in the West Student Data folder. You will explore the relationship between the screen page and the printed page, establish document parameters, check spelling, add automatic page numbers and other text to the top and bottom of each printed page, and preview each to-be-printed page on screen before you print. By the end of Unit 7, you should be able to use the Macintosh and MS Word to produce accurate multiple-page reports.

Learning Objectives

At the completion of this unit you should know

1. the relationship between the screen page and the printed (hard-copy) page,
2. the four basic parts of a document: text area, margins, header, and footer,
3. that the Macintosh window provides a changeable view of the document,
4. the pagination process,
5. how an on-line dictionary checks spelling, but has limitations.

At the completion of this unit you should be able to

1. format page size and orientation,
2. change margins,
3. create a header and a footer,
4. automatically date and number each page of a multiple-page document,
5. scroll to view different parts of the document,
6. identify page breaks on screen,
7. correct spelling with MS Word’s on-line dictionary,
8. preview and print a multiple-page document.

The Screen Page and the Printed Page

The ultimate goal of most computer projects is to produce a document that is both accurate and attractive on paper. This presents a challenge. Standard letter paper is $8\frac{1}{2}$ inches wide by 11 inches long—considerably larger than the typical Macintosh monitor.

The solution is to view and manipulate only part of the document at a time within its document window. Figure 7.1 shows a new MS Word document window with the Ruler and Ribbon hidden. Nearly all Macintosh document windows resemble the MS Word document window.

To maximize your screen workspace, only the essential text area appears inside the document window itself. This primary working view of your document is called normal view.

The Parts of the Printed Document Page

The text area is the main part of the document. When you print a document, each printed page consists of more than just the text that will fit on that page. The margins—left, right, top, and bottom—are the blank spaces between the edge of
the paper and the text area. The header is repeated information printed in the top margin of every printed page. The footer is repeated information printed in the bottom margin of every printed page. Headers and footers are optional.

Figure 7.2 shows the portion of a standard printed page that appears within the MS Word document window of a compact Mac when you first open the document. (A larger monitor will show more.) Figure 7.2 also identifies the additional parts of the printed page that you do not see in normal view.

**Scrolling the Text Area**

For most documents, the text area is too large to fit inside the Macintosh window. When you open a large document, its window displays only the top left corner of its text area (see Figure 7.2). To locate and to work with hidden text, scroll the window—just as you scrolled through the Desktop to locate hidden icons. Now, we’ll refine this scrolling process so you can control your text view with precision.

You remember that each scroll bar has four components: the scroll bar itself, the scroll box, and a scroll arrow at each end (see Figure 7.3). The scroll arrows let you gradually change what you see in the window. Each click of a scroll arrow moves the window display a few characters or a line at a time in the direction the arrow is pointing. The scroll bar lets you change the window screen page by screen page. (A screen page is what is currently displayed in the window.) The scroll box is both a tool and an indicator. As a tool, the scroll box is dragged along the scroll bar to move directly to a specific part of the text area. As an indicator, the scroll box’s position corresponds to the part of the document displayed in the window.
You scroll down to see the text below your current view. The window itself is stationary. As you scroll down, the text area appears to move up. The scroll box displays the position of the window relative to the entire text area. When the scroll box is at the top of the scroll bar, the window displays the beginning of the text area; when it is at the bottom of the scroll bar, you see the end of the text area. It takes some practice to get your bearings when you scroll. Imagine a document that is one-page long when printed. Figure 7.4 shows the part of that document that you would view when you first open it and after you scroll down to the end of its text area.

GUIDED ACTIVITY 7.1

Precision Scrolling

Guided Activity 7.1 shows you how to scroll with precision. You begin by opening the unformatted, incorrect report called Long Doc. As you scroll to view hidden parts of the text area, you will use the scroll arrows to scroll line by line, the scroll bar to scroll screen page by screen page, and the scroll box to move directly to a particular part of the text area. When you are done, leave Long Doc open for Guided Activity 7.2.

1. Locate and Open the Long Doc document file in the West Student Data folder on your Data Disk. On a compact Mac, your window should look like the one in Figure 7.5. As you can see, only the beginning of the document's text area is visible within the window. This view of your document is called normal view.

2. Locate the vertical scroll bar, the scroll box, and the up and down scroll arrows at the right edge of the document window.
FIGURE 7.5
The Long Doc
document window when it first opens (Ruler and Ribbon hidden)

TITL
The Computer as a Machine
Machines expand human powers and skills. Typewriters, pulleys, and automobiles are
examples of machines that extend our physical abilities. Computers are machines that
expand our mental abilities. Computers can quickly and accurately calculate, sort, and
process large quantities of data. They expand our ability to solve problems and to make
decisions.

Each computer needs human instructions to perform its complex tasks. Without
instructions, a computer is nothing more than a box of chips. 95% of a computer's value is
in its instructions—its hardware only makes up the remaining 5%.

How Do You Instruct a Machine?
At its most basic level, each computer has a special set of electrical switches. They are
either on (1) or off (0). The switches' on-off sequence forms a code, called machine code.

3. Click the down scroll arrow. Your text area scrolls down a line. The top line of
text vanishes, and the first hidden line appears at the bottom.

4. Check the position of the vertical scroll box. The vertical scroll box moves
down slightly to indicate that the window no longer displays the very top of
the text area.

5. Press the down scroll arrow to keep your text area scrolling downward, line by
line. As long as you press the down arrow, the text continues to scroll down
until you reach its end. The vertical scroll box also moves to indicate the win-
dow's position relative to the text area.

6. Press the up scroll arrow until you have returned to the beginning of the
text area.

7. Use the scroll bar to move the text area down one screen page at a time.
   a. Point anywhere in the gray part of the scroll bar below the scroll box.
   b. Click once. The next screen page will appear, and the scroll box will jump
down to confirm the change.
   c. Repeat steps a. and b. to scroll down one screen page at a time until you
      reach the end of the text area.

8. Reverse direction. Click repeatedly in the scroll bar above the scroll box to
    scroll up screen page by screen page until you reach the beginning.
9. Use the scroll box to go directly to different parts of the text area. As you drag the scroll box, the status area in the bottom left corner of the MS Word document window will change to display the page number of the scroll box's current location.

a. Drag the scroll box to the bottom of the scroll bar to go immediately to the end of the text area. Examine the status area.

b. Drag the scroll box to the middle of the scroll bar to jump to the middle of the text area. Examine the status area.

c. Drag the scroll box to the top of the scroll bar to return to the beginning of the text area. Examine the status area.

Setting Document Parameters

Document parameters are the specific settings the computer uses to relate the on-screen document to the printed page. Each printed page of a computer document must use the same size paper, called paper size. Likewise, each page must have the same orientation or print direction. Finally, all printed pages must have the same margins or blank spaces surrounding the text area of the document.

PAGE SIZE AND ORIENTATION

File/Page Setup displays a special dialog box where you can change the page size and orientation. Every application uses its own version of File/Page Setup to tell specific printers how to lay out and to print documents. Figure 7.6 shows MS Word's Page Setup dialog boxes for four commonly used Macintosh printers. Notice that each dialog box is slightly different.

Your printer limits your paper size choices; it will not let you select a paper size it cannot print. To change paper size from the default US letter (8½ by 11 inches) to legal size document (8½ by 14 inches), click its radio button, the circle to the left of each paper size choice. Radio buttons are mutually exclusive; you can
only pick one of the radio button options. When you change paper size, you change it for the whole document.

**Paper:** US Letter

You can print a document in one of two directions, or orientations. **Tall** (or portrait) orientation prints the document vertically across the width of each page; **wide** (or landscape) orientation prints the document horizontally down the length of each page. The Page Setup dialog box has two buttons (shown in Figure 7.7) that let you choose between these orientations.

The default orientation is tall, so the tall orientation button will be highlighted. You can switch from the default tall to wide by clicking the wide orientation button. When you change orientation, you change it for the whole document.

**MARGINS**

**Default margins** preset the blank space that surrounds the text area on each printed document page. Margins are required because the printer cannot print all the way to the edge of the paper. Margins also make printed pages more attractive. Most programs have at least one inch of default margin surrounding the text area on each side. Figure 7.8 shows MS Word’s default margin settings displayed in the Document dialog box.

One reason to change margins is to print a document on more or fewer pages. Another reason is to alter the document’s aesthetic appearance. Margins are easy to change. You choose Format/Document to display the dialog box, type in the new margin measurement(s), and click OK. The computer then rearranges the document to conform to your new margin settings. Remember, margins define the blank space for every side of every page of the entire document. You will learn how to indent specific parts of the text area in Unit 8.
THE HEADER AND THE FOOTER

You can find headers and footers in nearly every book, magazine, or newspaper. Headers and footers place repetitive information, such as a publication’s name or page number, into the top or bottom margins of each document page. A given document can have both headers and footers, either headers or footers, or no headers and footers.

MS Word’s headers and footers are viewed and modified in their own windows. View/Header displays the header window; it lets you create and edit header information (Figure 7.9).

View/Footer displays the footer window. Except for their position on the printed page, the header and footer windows are identical. Each header or footer window has three special buttons that can place a computer-generated number, date stamp, and/or time stamp on each document page.

GUIDED ACTIVITY 7.2
Setting Document Parameters

Guided Activity 7.2 continues from Guided Activity 7.1 with Long Doc open. First, you will determine the document’s page size, orientation, and margins. Then, you will create a header to number its pages in the upper-right corner and a footer to place the words The Long Document and the date at the bottom of every page. Finally, you will save your modified document as Long Doc 1. Leave the document open for later Guided Activities.

1. Examine the document’s page size and orientation.
   a. Choose File/Page Setup to view the Page Setup dialog box (see Figure 7.6).
   b. Confirm that the page size is US Letter and the orientation is tall or portrait.
   c. Click Cancel. When you click Cancel, you close a dialog box without altering any settings. When you click OK, you instruct the Mac to accept any changes you made in the box.

   NOTE When you are merely inspecting a dialog box, you should close with Cancel to avoid making unintended changes.
2. Examine the document's margin settings.
   b. Confirm that the default margins match the settings in Figure 7.8. Ignore the other settings in the box.
   c. Click Cancel.

**NOTE** If your margin settings do not match Figure 7.8, change them and then click OK, not Cancel.

3. Place a computer-generated page number in the upper-right corner of each printed page.
   a. Choose View/Header to display the header window and View/Ribbon to display the Header's Ribbon.
   b. Click the Header Ribbon's nonprinting character button to display nonprinting characters. Each header and footer has three (invisible) areas: left, center, and right.
   c. Press \[\text{Tab}\] twice to move the insertion point to the right side of the header.

![Figure 7.10](image)

A nonprinting arrow will appear each time you press \[\text{Tab}\], and the insertion point will move over to the right as in Figure 7.10.

   d. Click the **page number button**; to set the page number at the insertion point. This will place the **automatic page number symbol** in your header, a number 1 with a dotted box around it. The number in the dotted box changes, depending upon the insertion point's location in the document itself.
   
   e. Click the Ribbon's hidden character button again to turn off the hidden characters. Now the page number looks like an ordinary number.
   
   f. Close the header window to return to your document. Note that no page number appears in your document window.

4. Save as Long Doc 1.

5. Create a footer.
   a. Choose View/Footer to display the footer window.
   b. Press \[\text{Tab}\] once to move the insertion point to the center of the footer.
c. Type the phrase The Long Document. It will appear centered in the footer window.

d. Press \( \text{Tab} \) once to move to the right of the footer.

e. Click the date stamp button to place the date in the right corner of the footer.

f. Show hidden characters. Your footer should resemble Figure 7.11, but with a different date.

g. Close the footer window. Again note than no footer text appears in the document window.

6. Save. If you wish to stop at this point, quit MS Word. To resume, double-click on the Long Doc 1 icon in the West Student Data folder of your Data Disk.

**Previewing the Printed Page**

Most programs allow you to screen *preview* each document page as it will be printed. Previewing enables you to see the relationship among the text area, margins, header, and footer. You should preview document pages before you print to monitor their appearance. It is much faster (and more economic) to preview on screen than to use the printer to check your progress.

Most monitors reduce the preview page size to fit on the screen. If your monitor is small, you may not be able to read the text. Nevertheless, you can magnify parts of the screen preview to see them at actual size. The next Guided Activity will show you how.

**GUIDED ACTIVITY 7.3**

*Previewing a Multiple-Page Document on Screen*

Guided Activity 7.3 continues from Guided Activity 7.2. Here, you will preview *Long Doc 1*, magnify various parts of the document, and return to normal view (the document window). Leave *Long Doc 1* open for the next Guided Activity.

1. Choose File/Print Preview to preview *Long Doc 1*. Your screen will resemble Figure 7.12. Print Preview shows two document pages at a time.
2. Locate the margins with their header and footer that didn’t show in the document window.

3. Magnify the page number of the second page to be sure it is correct.
   a. Click the magnification button to choose it.
   b. Click the upper-right corner of page 1 to magnify it and see the page number as in Figure 7.13.

4. Restore the screen to the reduced preview.
   a. Examine the magnification button. It has toggled to become a restoration button.
   b. Click the restoration button to return to the preview screen.

5. Repeat steps 3-4 to see the automatic page numbering on page 2. The Print Preview vertical scroll bar scrolls to display different document pages.

6. Click the vertical scroll bar so that the preview screen displays the next two pages of the document, pages 2-3.

7. Magnify the last line on page 2, and write it down. You will need it for a later activity.
Correcting Mistakes

Once you start using the computer to type letters and reports, your work becomes much more attractive. It will also become more accurate as the computer helps you to correct mistakes. Many people's number-one reason for retiring their typewriters in favor of computers is the availability of on-line spelling correction with a computer.

The Spell Checker

Most word processing programs incorporate a special program called a spell checker that checks for the correct spelling of words in a document.

Spell checkers compare each document word to a file of correctly spelled words. MS Word's spelling file contains more than 80,000 words. You can also create custom dictionaries to include entries that MS Word left out (like our names, Heiman and McCauley).

Tools/Spelling (F7) scans your document for spelling and punctuation errors and repeated words. It checks all the text in a document, including header and footer text. When the spell checker finds a word that is not in its dictionary, it suggests possible corrections. It also alerts you when words are typed twice and lets you delete one.

Spell checkers are not perfect. Even with 80,000 words, they can only compare your words to words listed in their dictionary. They cannot tell you when you have typed an inappropriate but correctly spelled English word. You will better understand both the advantages and limitations of the spell checker by using it.

GUIDED ACTIVITY 7.4

Checking Your Spelling

Guided Activity 7.4 continues from Guided Activity 7.3. You will use MS Word's on-line spell checker to correct Long Doc 1's misspellings. When done, you should have a better understanding of both the advantages and the limitations of an on-line spell checker.

1. Save.

Note Always save before you check spelling. In rare instances—especially in networks and computer labs—the computer screen may freeze while loading the spelling dictionary. You will need to turn the computer off and then on, which will cause you to lose any unsaved work.
2. Place the insertion point at the very beginning of the document. MS Word checks spelling from the insertion point downward.

3. Choose Tools/Spelling to load the spelling dictionary and display MS Word’s spell check dialog box. MS Word will display the first word it finds that is not in the dictionary, *machnie* in Figure 7.14, and give suggestions to correct it.

![Figure 7.14](image)

MS Word has already guessed that the correct word is *machine*. It has highlighted the correct word and placed it in the Change To: box.

4. Click the Change button. MS Word will replace *machnie* with *machine* and search for the next misspelled word.

5. Continue checking.
   a. The next identified word, *programmming*, has an extra *m*. Change it.
   b. The next word, *langages*, is missing a *u*. Change it.
   c. *Codde* has an extra *d*. Change it.

6. MS Word has no suggestions for the next error, a missing space between the end of one sentence and the beginning of the next one. You can fix it, anyway!

![Figure 7.15](image)

a. Click in the Change To: box (Figure 7.15) to activate it. Now you can edit directly in the box.

b. Place the I-beam between the period and *S* of *Systems* and click to set an insertion point.
c. Type a space to separate the sentences.
d. Click Change. MS Word will add the space and look for the next problem.¹

7. The word programs is typed twice in a row. Click Delete (Figure 7.16) to remove one of the occurrences.

8. The kind should have a space between the two words. Change it. PacMan, AstroBlaster, and Carmen are not in the dictionary, but they are spelled correctly.

9. Click Ignore to leave each word unchanged and continue spell checking. You have scanned the entire document.

10. Save as Long Doc 2 and print.

11. Quit MS Word.

**Proofreading**

The spell checker will not find all your errors. It cannot identify correctly spelled words that have been used incorrectly. You must still read through the entire document and check for errors. This process is called *proofreading*. Although it is possible to proofread on screen, most people proofread more accurately on paper.

Here is an “unguided” activity. Carefully read the Long Doc 2 printout. Correct any incorrect words directly on the hard copy. Then, open, correct on screen, save, and print the recorrected Long Doc 2 file.

**Pagination**

Have you wondered how MS Word “knows” how much text fits on a printed page or when to start the next one? As you work, MS Word calculates page endings and sets *automatic page breaks* to avoid trying to place more text lines than would fit on a printed page. This process is called *pagination*. Every time MS

¹ If you separate two words that have different character formats such as “used System,” typing a space between them in the spell checker and then clicking Change will give both words the character format of the first word, producing “used System” in this example.
Word starts a new printed page, it draws a dotted line on screen. This page break indicates where the current printed page ends and the next begins, as shown in Figure 7.17.

**Utility software increases the functionality of the computer’s operating system. Utility programs might allow the user to organize files more efficiently, or to protect against computer viruses.**

**Software Application Programs**

Software application programs (or simply, applications) direct the computer to perform specific tasks. Without applications, the computer cannot do any "work."

It is unnecessary to type blank lines before and after the page break. When MS Word prints the page, it will add the bottom margin to the end of the first page (see Figure 7.18) and the top margin to the beginning of the next page (see Figure 7.19).

The computer automatically repaginates or adjusts the page breaks whenever you do something that affects the size of your document. MS Word will repaginate if you change the paper size, orientation, or margin space. It will also repaginate if you edit the text to increase or to decrease the number or size of text lines in the document.

**GUIDED ACTIVITY 7.5**

**Changing Document Parameters and Observing Repagination**

Guided Activity 7.5 continues from Guided Activity 7.4 with Long Doc 2 open. You begin by changing the document’s orientation from tall to wide. Then, you use the horizontal scroll bar to view parts of the document that are currently out of sight, and check your position on the Ruler. Next, you preview your document,
analyze the affects of changing its orientation, and print the landscape-oriented document. Finally, you restore the document to tall orientation, change its margins, preview, and print again.

1. Change document orientation to wide or landscape.
   a. Choose File/Page Setup.
   b. Click the wide orientation button to change your document to landscape.
   c. Click OK to set the change and return to the document window. If you had clicked Cancel, the orientation would not change, even though you first clicked the wide orientation button. OK accepts the dialog box changes; Cancel aborts them.

2. Observe the text in the document window. The text continues past the right border of the document window.

3. Scroll up (vertically) so that The Computer as a Machine is the top line in the window. You used the up scroll arrow, right?

4. Scroll to view the right part of the document page.
   a. Locate the horizontal scroll bar at the bottom edge of the Long Doc window (see Figure 7.21).

When the horizontal scroll box is to the far left, as in Figure 7.21, the window displays the left part of your document.

b. Check the Ruler to confirm the horizontal scroll box’s position.

As set, the MS Word Ruler, shown in Figure 7.20, measures only the text area of your document. Zero is the left side of the text area, not the left edge of the paper.
c. Drag the horizontal scroll box about an inch to the right and release it.

![Horizontal scroll box](image)

The window displays a different part of the document, as the Ruler will confirm. The right part of the window is blank because your scroll has moved beyond the right margin. The Ruler's dotted line (see Figure 7.22) indicates the right margin.

*FIGURE 7.22*
The window continues although the text area does not.

---

Right margin indicator

---

The window displays a different part of the document, as the Ruler will confirm. The right part of the window is blank because your scroll has moved beyond the right margin. The Ruler's dotted line (see Figure 7.22) indicates the right margin.

---

d. Drag the horizontal scroll box back to its original position to restore your original view.

5. Preview the new orientation.

a. Choose File/Print Preview to see a screen like Figure 7.23.

*FIGURE 7.23*
Print Preview in wide orientation (wide orientation looks distorted when previewed)

---

b. Magnify the bottom of the second page.

c. Compare the last line on page 2 to your last line from Guided Activity 7.3. They are not the same. When you changed orientation, MS Word repaginated the document.

d. Click the Restore button.

6. Preview the additional page(s).

a. Click the vertical scroll bar to move "down" one printed page. MS Word displays pages 2 and 3.

b. Click the vertical scroll bar below the scroll box. MS Word displays page 3 and a blank page.
7. Drag the scroll box back to the top of the scroll bar to return to pages 1 and 2.

8. Observe the position of your headers and footers. When you changed orientation, only the text area of your document widened, not the headers and footers. No problem—you’ll change back to tall orientation soon.

9. Click the Print button to print directly from the Preview screen.

The icon of the currently chosen printer driver will appear as the Print button (the LaserWriter here). If you have selected a different printer driver in your Chooser window, you may see a different icon on your screen.


11. Restore tall page orientation.
   a. Choose File/Page Setup
   b. Click the tall orientation button.
   c. Click OK to return to the document window.

12. Change the margins.
   b. Change all four margins to two inches.
   c. Click OK.

13. Preview and print.

14. Change the margins so that the entire document fits on two printed pages.

   **Note** Do not make any margin smaller than ½ inch or your printer may not be able to print it.

15. Save, preview, print, and quit.

**Summary**

Unit 7 focused on the preparation of a multiple-page printed document. You began by establishing your document parameters. You used File/Page Setup to determine the size of your document’s printed pages and the print orientation, tall or wide. Then, you explored the relationship between the screen page and the printed page and used both window scrolling and Print Preview to view different parts of the to-be-printed document. You learned that each printed page has four parts: the text area, the margins, the header, and the footer—with only the text area displayed in the normal MS Word document window. Next, you added computer-generated page numbers to your header and the document title and a computer-generated date to the footer. Finally, you used MS Word’s built-in
spell checker to identify and correct some document errors, and then carefully proofread your printed document to find and to correct those errors the spell checker missed. Having completed Unit 7, you should be able to create your own multiple-page reports.

Command Review

You should now know these Macintosh and MS Word commands.

File/Page Setup Displays the Page Setup dialog box where you can change document paper size and orientation.

View/Header Displays the MS Word header window where you enter and edit text that will appear at the top of every printed document page.

View/Footer Displays the MS Word footer window where you enter and edit text that will appear at the bottom of every printed document page.

Check spelling Choose Tools/Spelling (Enter). This displays the MS Word spelling window in which you can compare the words in your document to MS Word’s on-line dictionary, and correct misspelled words.

Preview Choose File/Print Preview. This displays document layout, page-by-page, as it will print.

Scroll down Click or press the down scroll arrow, drag the vertical scroll box down, or click the gray scroll bar below the scroll box. This allows you to view text area below current window, or subsequent pages in Preview.

Scroll up Click or press the up scroll arrow, drag the vertical scroll box up, or click the gray scroll bar above the scroll box. This allows you to view text area above current window, or previous pages in Preview.

Scroll left Click or press the left scroll arrow, drag the horizontal scroll box left, or click the gray scroll bar to the left of the scroll box. This allows you to view text area to the left of the current window.

Scroll right Click or press the right scroll arrow, drag the horizontal scroll box right, or click the gray scroll bar to the right of the scroll box. This allows you to view text area to the right of the current window.
Exercises

The following exercises and questions will help you to understand the relationship between the screen and printed document. They will also let you practice setting document parameters, scrolling the text area of multiple-page documents, and checking document accuracy.

Practice changing page set up and margins, scrolling, spell checking, document previewing and proofreading. Each named document is in the Exercises folder in the West Student Data folder on your Data Disk.

After you open each document, Save As its file name followed by U7. Type its file name in the center of the header and your name on the right side. Place a computer-generated date in the center of each footer and a computer-generated page number on the right. After you complete each exercise, save and print your work.

1. Document: all labors
   a. Change the margins.
      Left and top margins to 1.25 inches, right margin to .5 inch, bottom margin to 1 inch.
   b. Preview to check your headers, footers, and the number of the last page.
   c. Bold each labor (for example, Labor 1), and add your own character formatting to the document to make it more attractive.

2. Document: Shakespeare U6
   Create two horizontal posters with one Shakespearean quote on each.
   a. Move in the line beginning Jaques ½ inch by placing the insertion point before the J and pressing Tab.
   b. Move in the line beginning Lysander ½ inch by placing the insertion point before the L and pressing Tab.
   c. Change the print orientation to landscape.
   d. Enlarge type size to fill page. (Hint: 18–24 points.)
   e. Change margin settings so that each quote is on its own page. (Hint: set top and bottom margins between 2.5 and 3.5 inches.) Use Print Preview to monitor your progress.

3. Add to your knowledge. Select a computer concept that you want to better understand and type a paragraph or two that clarifies it. Use this textbook and on-screen help to aid you. Spell check and print your document. Then, format your document and print a second copy.
4. Type at least two pages on any subject that lends itself to character formatting: a poem, a personal story, a newspaper article, or a computer article. At the end of the passage, briefly explain why you chose your topic. Spell check and print your document. Then, format your document and print a second copy.

Review Questions

**Multiple Choice**

1. The fastest way to determine the relationship of an on-screen document to the printed page is to use
   a. Print Preview
   b. Page Setup
   c. the document window
   d. the printed page

2. A document need not have which of these?
   a. margins
   b. page size
   c. headers and footers
   d. orientation

3. The MS Word document window normally displays only the text area because
   a. headers and footers are not always used
   b. documents vary, but margins, headers, and footers remain constant on each page
   c. text in document margins is unimportant
   d. margins are not always used

4. Each time you click a vertical scroll arrow, your document view moves up or down
   a. one line at a time
   b. one full screen at a time
   c. one printed page at a time
   d. none of these
5. The spell checker finds all
   a. document words not in the spell checker dictionary
   b. words used incorrectly
   c. your mistakes
   d. none of these

**True or False**

1. ___ The document window is the same size as a standard sheet of paper.
2. ___ The text area is the main part of the document.
3. ___ Text printed under the normal print area of the page is called a header.
4. ___ Pagination is the computer’s ability to calculate the beginning and endings of printed pages.
5. ___ As you scroll down, text scrolls up. This is because the document window is stationary.

**Fill In the Blanks**

Solve the crossword puzzle shown in Figure 7.24.
ACROSS

2. To print on the length of paper in horizontal fashion
4. Dotted page separator. Two words, no spaces
5. A feature that checks for the correct spelling of document words against an online dictionary. Two words, no spaces
6. To move through a document
10. To alert you the computer will__________
12. The ___________ scroll bar moves window display to the left or to the right
15. Overall direction in which print is placed on paper
16. The file that holds your work is called a ________________
17. A computer-inserted page break is_______________
18. On-screen rectangle where you can see all or a portion of your work
19. Area reserved to place the same text at the bottom of each document page

DOWN

1. Area reserved to place the same text at the top of page(s)
3. Planning margins, text, and graphics on page. Two words, no spaces
4. Peek at document before printing. One word
7. A round button to select a choice
8. Tall orientation.
9. ____________ scroll bar, moves up and down
11. The division of a document into printable segments
13. To see the text area below the document window, scroll ________________
14. An automatic application setting is called a ________________

WORD LIST

<table>
<thead>
<tr>
<th>automatic</th>
<th>landscape</th>
<th>scroll</th>
</tr>
</thead>
<tbody>
<tr>
<td>beep</td>
<td>orientation</td>
<td>spell checker</td>
</tr>
<tr>
<td>default</td>
<td>page break</td>
<td>vertical</td>
</tr>
<tr>
<td>document</td>
<td>page layout</td>
<td>window</td>
</tr>
<tr>
<td>down</td>
<td>pagination</td>
<td></td>
</tr>
<tr>
<td>footer</td>
<td>portrait</td>
<td></td>
</tr>
<tr>
<td>header</td>
<td>preview</td>
<td></td>
</tr>
<tr>
<td>horizontal</td>
<td>radio</td>
<td></td>
</tr>
<tr>
<td>Key Terms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>Automatic page break</td>
<td>Normal view</td>
<td></td>
</tr>
<tr>
<td>Automatic page number symbol</td>
<td>Orientation</td>
<td></td>
</tr>
<tr>
<td>Default margin</td>
<td>Page break</td>
<td></td>
</tr>
<tr>
<td>Document parameter</td>
<td>Page number button</td>
<td></td>
</tr>
<tr>
<td>Document window</td>
<td>Pagination</td>
<td></td>
</tr>
<tr>
<td>Footer</td>
<td>Paper size</td>
<td></td>
</tr>
<tr>
<td>Header</td>
<td>Portrait</td>
<td></td>
</tr>
<tr>
<td>Landscape</td>
<td>Preview</td>
<td></td>
</tr>
<tr>
<td>Magnification button</td>
<td>Proofreading</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Radio button</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repaginate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Restoration button</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Screen page</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scroll arrows</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scroll box</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Spell checker</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tall</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Text area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wide</td>
<td></td>
</tr>
</tbody>
</table>
Unit 8 differentiates between the grammatical paragraph and the computer paragraph. You will learn how to select and to format computer paragraphs. By the end of this unit you will be able to identify and to change a paragraph's line space, alignment, and indentation.

Learning Objectives

At the completion of this unit you should know

1. the distinction between the computer paragraph and the grammatical paragraph,
2. the basic kinds of paragraph formatting: line space, alignment, and indentation,
3. the purpose and functions of the MS Word Ruler.

At the completion of this unit you should be able to

1. select computer paragraphs,
2. display, identify, and hide MS Word's nonprinting characters,
3. use the MS Word Ruler to change line space, alignment, and indentation.
The Paragraph

By now, you are quite familiar with word wrap, and you know to use \texttt{Return} only when starting a new paragraph. However, the paragraph you create has a grammatical or English meaning and a computer meaning.

The Grammatical Paragraph

When you studied English grammar, you probably learned that a \textit{paragraph} is a collection of sentences on a related topic. Your English grammar book gave you rules for paragraph composition. A standard eighth grade textbook, \textit{English Grammar and Composition}, states: "A paragraph is a series of sentences developing one topic... The topic of a paragraph is stated in one sentence. This sentence is called the \textit{topic sentence}. ... Every sentence in a paragraph should support the main idea expressed in the topic sentence."\footnote{John E. Warriner and Sheila Laws Graham, \textit{English Grammar and Composition, Second Course} (Harcourt Brace Jovanovich, 1977) 349.} Whenever you begin a new topic, you should also begin a new paragraph.

The grammatical paragraph depends on meaning. To set the boundaries of a grammatical paragraph, you must know the meaning of every sentence in that paragraph. Figure 8.1 contains two grammatical paragraphs. The first starts with \textit{Machines expand...} and the second begins with \textit{Each computer needs...}.

Current software does not "understand" the sentence meaning well enough to determine how to divide a stream of sentences into paragraphs. In fact, English instructors do not even agree on paragraphing. Style often determines paragraph size. William Paxson, the author of \textit{Principles of Style for the Business Writer}, explains:

Paragraphs today come in several forms. Newspapers often use one-sentence paragraphs to present a story in short bursts. Magazines such as The New Yorker follow a style that calls for long, highly developed paragraphs. Writers of dialog start a new paragraph when a different

\begin{figure}[h]
\centering
\begin{tabular}{|l|}
\hline
\textbf{FIGURE 8.1} \quad Two grammatical paragraphs \\
\hline
\textbf{TITLE} \\
\textbf{The Computer as a Machine} \\
Machines expand human powers and skills. Typewriters, pulleys, and automobiles are examples of machines that extend our physical abilities. Computers are machines that expand our mental abilities. Computers can quickly and accurately calculate, sort, and process large quantities of data. They expand our ability to solve problems and to make decisions. \\
Each computer needs human instructions to perform its complex tasks. Without instructions, a computer is nothing more than a box of chips. 95\% of a computer's value is in its instructions—its hardware the remaining 5\%. \\
\hline
\end{tabular}
\end{figure}
character begins to speak. In fiction, the story is advanced and action is shown in a narrative paragraph, a paragraph that is nothing more than a very short story.²

**The Computer Paragraph**

To avoid the problem of inconsistent grammatical paragraphing, word processing programs use a more consistent definition of a paragraph called the *computer paragraph*. MS Word’s on-screen Help defines a paragraph as “any amount of text and or graphics followed by a paragraph mark, or a paragraph mark alone (§)” (on-line help, MS Word 5.1). The length of a computer paragraph can range from a multiple-sentenced grammatical paragraph to a word or phrase, a single character, a picture, or even a blank line. Each computer paragraph can be formatted individually, even if it does not contain any text.

The simplest way to determine how many computer paragraphs are in a passage is to display its hidden characters. Figure 8.2 shows the same passage as Figure 8.1, but with its hidden characters displayed and computer paragraphs numbered 1–10.

---

**FIGURE 8.2**

Ten computer paragraphs

1. `<your name>`§
2. `<class name>`§
3. Title§
4. The Computer as a Machine§
5. Machines expand human powers and skills. Typewriters, pulleys, and automobiles are examples of machines that extend our physical abilities. Computers are machines that expand our mental abilities. Computers can quickly and accurately calculate, sort, and process large quantities of data. They expand our ability to solve problems and to make decisions.§
6. Each computer needs human instructions to perform its complex tasks. Without instructions, a computer is nothing more than a box of chips. 95% of a computer’s value is in its instructions—its hardware the remaining 5%. §

Every time `Return` is pressed, a new computer paragraph is created. For example, Figure 8.2 has ten computer paragraphs, but Figure 8.1, the same paragraph, has only two grammatical paragraphs. Each computer paragraph includes all the characters between `Return` pressings. Throughout this book, *paragraph* designates the computer paragraph unless otherwise indicated.

Since you can only see these all-important paragraph symbols when MS Word’s hidden characters are displayed, this is a good time to examine hidden characters in more detail.

---

NONPRINTING CHARACTERS

Not every key on the keyboard types an alphanumeric character. Return, Tab, and [Spacebar] produce nonprinting characters; they operate, but do not print. In Unit 7, you used the hidden character button on the MS Word Ribbon to display and hide these characters. Now, you will examine their use in greater detail.

<table>
<thead>
<tr>
<th>FUNCTION</th>
<th>SYMBOL</th>
<th>KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paragraph mark</td>
<td>¶</td>
<td>Return or Enter</td>
</tr>
<tr>
<td>End-of-line mark</td>
<td>←</td>
<td>Shift Enter</td>
</tr>
<tr>
<td>Tab mark</td>
<td>→</td>
<td>Tab</td>
</tr>
<tr>
<td>Normal space</td>
<td>. (dot)</td>
<td>Spacebar</td>
</tr>
<tr>
<td>Nonbreaking space</td>
<td></td>
<td>Option Spacebar</td>
</tr>
<tr>
<td>Nonbreaking hyphen</td>
<td>≈</td>
<td>(tilde)</td>
</tr>
<tr>
<td>Optional hyphen</td>
<td>−</td>
<td>(hyphen)</td>
</tr>
<tr>
<td>Formula character</td>
<td>\</td>
<td>(backslash)</td>
</tr>
<tr>
<td>End-of-cell mark</td>
<td>•</td>
<td>*</td>
</tr>
<tr>
<td>Paragraph properties</td>
<td>■</td>
<td>*</td>
</tr>
</tbody>
</table>

Table 8.1 shows some of the nonprinting characters you might see on the MS Word screen. The three symbols that you need to recognize are the paragraph mark, the tab mark, and the normal space (mark). The other symbols are more meaningful to advanced word processors.

It can be distracting to display the hidden characters all the time. For example, notice the similarity between a space, a period, and a comma.

displaying. For example:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Period</td>
<td>Space</td>
<td>Comma</td>
</tr>
</tbody>
</table>

Display hidden characters when you proofread a document on screen, however, to easily identify extra spaces or other problems.

normal space

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Two spaces</td>
<td></td>
</tr>
</tbody>
</table>

Each invisible character can replace a selected text block in the same way that a visible character, such as a 1 or a 3, can replace a character. If you have your whole document selected and accidentally hit a nonprinting key, such as the Spacebar, that nonprinting character will replace your entire document. Fortunately, you can always Undo such a mistake—as long as you remember to Undo it immediately!
Nonprinting Characters

Guided Activity 8.1 uses the While document in the West Student Data folder on your Student Data Disk. After you display the hidden characters, you will: replace text blocks with a Tab, a Return, or a Space; observe the effects; then Undo each replacement to restore your text. Begin at the Desktop.

1. Open the While document. The document is in 14 point Geneva to make its nonprinting characters more salient.

2. Click the Ribbon’s hidden character button to display nonprinting characters (if they are not already displayed).

3. See the effects of Spacebar replacement.
   a. Be sure the insertion point is at the very beginning of the document.
   b. Press Spacebar once.
      The entire line moves one character to the right and the nonprinting normal space character (dot) appears on screen.
      Replaced by a space
   c. Select the block While text is selected in the second sentence.
      While text is selected
   d. Press Spacebar once.
      The selected block vanishes, replaced by the nonprinting normal space dot.
      Replaced by a space
   e. Undo to restore your lost text.

4. See the effects of Return replacement.
   a. Place the insertion point at the beginning of the third sentence.
   b. Press Return once.
      Extra return
      While text.
      The entire sentence moves down a line and an additional nonprinting paragraph mark character appears on screen.
   c. Select the block While text is selected in the fourth sentence.

The selected block vanishes, replaced by a nonprinting paragraph mark, and the rest of the sentence moves down to the next line.

\[\text{While text is NOT.}\]
\[\text{press RETURN.}\]

e. Undo to restore your lost text.

5. See the effects of [Tab] replacement.
   a. Place the insertion point at the beginning of the fifth sentence.
   b. Press [Tab] once. MS Word has default tab stops every half inch.

   \[\text{While}\]
   \[\text{press}\]
   \[\text{Selection replaced by a tab}\]

   While text is selected in the sixth sentence.
   c. Select the block While text is selected in the sixth sentence.
   d. Press [Tab] once. The selected block vanishes, replaced by a nonprinting tab mark character, and the rest of the sentence moves right to the next tab stop.

   e. Undo to restore your lost text.

6. Replace the entire document with a space. This can happen if you select the entire document, perhaps to change its font, and then you accidentally lean on the space bar.
   a. Select All.
   b. Press [Spacebar]. Everything is gone except the nonprinting normal space character.

   c. Undo.

7. Quit MS Word. To preserve the original document, click No when the dialog box asks you if you want to save.
Paragraph Formatting

Just like characters, paragraphs can be formatted. When you start a new document, paragraphs appear following the default paragraph format, the settings that the application applies to each paragraph unless you instruct it otherwise. In most cases, the default format creates single-spaced paragraphs that line up flush against the left margin as in Figure 8.3.

A paragraph's default format can be changed easily. You may alter how close the paragraph's lines are to each other (spacing), how the lines line up to the right and left margins (alignment), and how close the lines are to those margins (indentation). Figure 8.4 shows a variety of paragraph formats.

The Paragraph Mark

Each paragraph's format settings are stored at its end within its nonprinting paragraph mark, ¶. Since an individual paragraph can have only one set of format specifications at one time, each paragraph has one and only one paragraph mark. No matter how a paragraph is formatted, the ¶ itself looks the same.

Paragraph Selection

Like everything else on the Macintosh, a paragraph must be selected before its format can be changed. Paragraph selection works differently than character selection. When you select a block of text for character formatting, every character in the selection must be highlighted before it can be changed. To select an individual paragraph, however, you don't need to highlight every word. Simply moving the insertion point into a given paragraph selects that paragraph.
When you open a MS Word document, its insertion point is located to the left of the first character; therefore, the document opens with its first paragraph already selected. When you highlight a single character in a different paragraph to change its format, you concurrently select the entire paragraph and can change its format as well. If you want to select a group of paragraphs to format as a block, they must be next to each other. However, it is not necessary to highlight every character in each paragraph to select them; the ending period from one paragraph and the first letter of the next paragraph will do the job.

**SHIFT CLICK**

Working with multiple-page documents may require that you select a text block of several paragraphs, or even several pages. So far the only way you know to select a long passage is to start at the beginning and drag down until you reach the end. You can imagine how difficult it would be to select a fifteen-page text block to change its line spacing. In MS Word and in other word processing applications, you can use a procedure called *shift click* to select a long passage without having to drag the mouse all the way through it.

The shift click shortcut uses the mouse and the shift key together. Once learned, it is a real time saver; however, some people have trouble learning how to shift click. Take it slowly. These are the steps for text selection:

1. Set the insertion point at the beginning of the passage you wish to select.
2. Leaving the insertion point in place, scroll to the end of the desired passage.  
   *Do not click anywhere in the document, or you will move your insertion point.*
3. Press **Shift** and keep it down.
4. With **Shift** still down, click the end of the desired passage as if you were moving the insertion point.

   The entire passage will be selected.

Shift click selection is useful either at the Desktop or within an application. Here, you will learn to shift click within MS Word to select text. Unit 14 shows you how to shift click to select groups of Desktop icons.

**GUIDED ACTIVITY 8.2**

*Shift Click to Select Text Blocks*

Guided Activity 8.2 uses the original Long Doc in the West Student Data Disk folder. You will select and deselect text blocks of varying length by using the shift click technique then Quit.

1. Select a text block beginning with *Typewriters* and ending with *data*. Follow the steps a–f in Figure 8.5.
2. Delete the text block.
3. Undo the deletion.
4. Click anywhere in the document to deselect the text block.
5. Shift click the same text block in the opposite direction. It works both ways. Begin after the period following data and end with Typewriters.
6. Shift click a long passage, delete it, and restore it.
   a. Set the insertion point before the M in Machines.
   b. Drag the vertical scroll box to the bottom of the scroll bar to reach the end of the document.
   c. Hold down the Shift key.
   d. Click just after the last period in the document.
   e. Scroll up through the document to see that it is all selected.
   f. Delete the long passage.
   g. Undo the deletion.
7. Quit MS Word.

What can you do to a paragraph once it is selected? Use the MS Word Ruler to change line space, alignment, and indentation.

The Ruler

The Ruler is a horizontal scale with buttons that provide quick access to many paragraph formatting options. It is located at the top of the document window between the Ribbon and the document itself (see Figure 8.6).
The Ruler, shown in Figure 8.7, consists of two parts; the paragraph button strip on top and the horizontal scale directly below it.

The **paragraph button strip** allows you to format alignment and line space, and has other features not covered in this unit. The **horizontal scale** serves as both a measuring stick and a vehicle for setting and changing indentation and tabulation. This unit only covers indentation.

### Line Space

**Line space** is the amount of space that separates each line of text in a paragraph. The paragraph button strip contains three buttons that change line space.

The **line space buttons** let you choose between single spaced, one-and-a-half spaced, and double spaced lines. The button you choose will be highlighted, like single spacing shown in Figure 8.8 or double spacing shown in Figure 8.9.

Line space is set for an entire paragraph. In other words, all the lines of a given paragraph must have the same line space. If you want different spacing for different lines of a grammatical paragraph, you must divide the grammatical paragraph into separate computer paragraphs and format the line space for each separately.
Guided Activity 8.3 continues to format the report that you began in Unit 7. You will open Long Doc 2, display the hidden characters, select the entire document, change the line space of selected paragraphs, and save your changes. Finally, you will preview the document to see how the changes will affect the printed document. Leave Long Doc 2 open for subsequent Guided Activities.


2. Display the nonprinting characters, if they are not already visible. Now you can locate every return in the document to know where computer paragraphs begin and end.

3. Double space the entire document.
   a. Select All.
   b. Click the Ruler’s double space button.

4. Click anywhere in the first line of the document to set the insertion point in it. You have deselected the entire document. Now only the first paragraph, the one containing the insertion point, is selected.

5. Save.

6. Single space your name and class name.
   a. Select the first two lines of Long Doc 2.
   b. Click the single space button to return them to single space.

7. Single space the paragraph after the heading Word Processing.
   a. Scroll down until the heading Kinds of Applications is at the top of the window.
   b. Select the paragraph after the heading Word Processing
   c. Click the single space button. The paragraph should look like Figure 8.10.

8. Adapt step 7 to single space the paragraphs following the headings Spreadsheet, Database, and Graphics.

9. Save and leave the document open for the next Guided Activity.
Combining Paragraphs with Different Line Space

In Unit 3 you learned to join two paragraphs into one by placing the insertion point at the beginning of the second paragraph and tapping the [Delete] key. This technique only works if the two paragraphs to be joined have exactly the same paragraph format.

If you attempt to join two paragraphs with different formats, however—such as a double spaced paragraph with a single spaced paragraph—MS Word will not join them. Instead, you will hear an alert beep to let you know that the two paragraphs have different formats and cannot be joined in this way.

Since each paragraph mark holds all the paragraph’s formatting, you can join two paragraphs with different formats by selecting and deleting the intervening \[\text{¶} \] character. When the intervening \[\text{¶} \] is deleted, the original first paragraph, which now has no formatting instructions, acquires and follows the formatting instructions of the subsequent paragraph. Therefore, if you combined a single spaced paragraph with a subsequent double spaced paragraph, the combined paragraph would be double spaced. This process can be difficult to visualize. Try Guided Activity 8.4 for a better understanding.

Guided Activity 8.4 continues to format Long Doc 2. You will combine two paragraphs that have different line formats, save your work, preview, and leave the document open for Guided Activity 8.5. Be sure the hidden characters are displayed as you begin.

1. Locate the paragraph following the heading Education on the third page of Long Doc 2. It is one grammatical paragraph inadvertently typed as two computer paragraphs.

2. Place the insertion point to the left of the E in Educational (Figure 8.11). You have now selected the first computer paragraph.

3. Single space the paragraph that begins Educational... (Figure 8.11).

The computer paragraph beginning some cases remains double spaced.

---

3 Other word processors, such as MS Works, will join disparate paragraphs. In these cases, the joined paragraphs always acquire the format of the lower paragraph.
4. Join the paragraphs.
   a. Place the insertion point before the s in some.
   b. Press [Delete] to attempt to join the paragraphs. The computer sounds to alert you that it cannot join two paragraphs with different paragraph formats.
   c. Select the ¶ after in by dragging over it just as you would to select a printing character.
   d. Press [Delete]. The two paragraphs join. They are double spaced, as shown in Figure 8.12, observing the format of the remaining ¶ character.

5. Single space the paragraph.

6. Save.

7. Preview the document.
   a. Move your insertion point to the beginning of the document and choose File/Print Preview.
      When the screen appears, it displays only the first two pages of the document. With double spacing, Long Doc 2 is four pages long.
   b. Scroll down to preview each additional page (there are a total of four pages). The top of the screen identifies the pages that are currently displayed.
   c. If desired, use the magnifying glass to examine parts of the document in actual size.
   d. Click Close to return to normal view.

8. Leave Long Doc 2 open for the next Guided Activity.

Alignment

Alignment describes the relationship of a paragraph to its left and right margins. The paragraph button strip contains four alignment buttons, shown in Figure 8.13.
These buttons let you change the position of a paragraph’s lines relative to the document’s left and right margins. The individual alignment buttons are identified in Figure 8.14.

Left-aligned paragraphs line up straight against the left margin with their right edges uneven or ragged. Left alignment (Figure 8.15) is the most common form of alignment because it looks like typing and is easy to read. It is the default alignment setting.

Right-aligned paragraphs line up against the right margin with an uneven or ragged left edge. Right alignment is used to format special lines of text, such as `<your name>` and `<class name>` in Long Doc 2, or for poetry or special effects. You may want to avoid right-alignment for long prose English passages—it is too difficult to read. Figure 8.16 shows right-aligned paragraphs.

Centered paragraphs, as in Figure 8.17, appear in the center of the line, equidistant between the two margins. Centering is a common format for titles and invitations. If you change the length of a centered paragraph, the computer automatically adjusts its position relative to the margins. Convenient, isn’t it?

When you center paragraphs, avoid extra spaces before the text, or the paragraph will not center properly. Displaying hidden characters will show you the extra spaces, so that you can select and delete them (see Figure 8.18).

Justified paragraphs, as in Figure 8.19, line up against both the left and right margins, and are often used in a book or newspaper. The computer justifies text by
adjusting the space between each word in a line to make text line up against the margins. Computer-justified text can be attractive in long lines with small type size, but when type is large and lines are short, the computer does not have enough spaces between words to justify attractively.

The five lines of the Figure 8.19 were typed in one paragraph to exaggerate the word space problem. The arrows at the end of each line but the last line are non-printing end-of-line characters that were created by typing Shift Return, Shift Return moves the insertion point to the beginning of the next line without beginning a new paragraph (see Table 8.1).

The final line of a justified paragraph is left aligned automatically. Otherwise the last line of each justified paragraph would spread out, as in Figure 8.20.

Just like line space commands, alignment commands format the entire paragraph. If you want to format columns of text, you must use a more advanced tab technique that will not be taught in this text.

**Keyboard Shortcuts**

MS Word has a series of keyboard equivalents, shown in Table 8.2, that automate paragraph alignment. These shortcuts are logical; combine the first initial of the kind of alignment you want—Left, Center, Right, or Justified—with the and modifier keys. Again, applications other than MS Word use these same equivalents.

<table>
<thead>
<tr>
<th>TABLE 8.2</th>
<th>JUSTIFICATION</th>
<th>MENU BAR SYMBOLS</th>
<th>KEYS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Left</td>
<td>L</td>
<td>L Shift</td>
</tr>
<tr>
<td></td>
<td>Center</td>
<td>C</td>
<td>C Shift</td>
</tr>
<tr>
<td></td>
<td>Right</td>
<td>R</td>
<td>R Shift</td>
</tr>
<tr>
<td></td>
<td>Justified</td>
<td>J</td>
<td>J Shift</td>
</tr>
</tbody>
</table>
Guided Activity 8.5 continues from Guided Activity 8.4 with Long Doc 2 open. You will change the alignment of different paragraphs and apply some character formatting to make the document more attractive, and save your work for Guided Activity 8.6.

1. Right align the first two paragraphs in Long Doc 2.
   a. Select the first two paragraphs.
   b. Click the right align button or type [Shift].

2. Center the Title.
   a. Select the Title paragraph.
   b. Click the centering button or type [Shift].

3. Locate and center each of the following headings:
   a. How Do you Instruct a Machine?
   b. Kinds of Software
   c. Ease of Use
   d. Kinds of Applications
   e. The Future of Software Development

4. Save.

5. Format the characters in each centered heading in step 3 to 14-point Helvetica bold.

6. Center the Title and change its character formatting to 18-point Helvetica bold.

7. Format each of these subheads to 12-point Helvetica bold:
   a. Programming Languages
   b. Operating System Software
   c. Utility Software
   d. Software Application Programs
   e. Word Processing
   f. Spreadsheet
   g. Database
   h. Graphics
8. Justify each of the paragraphs following these subheads:
   a. Word Processing
   b. Spreadsheet
   c. Database
   d. Graphics
   e. Education
   f. Recreation

9. Save.

Indentation

Indentation describes paragraph width relative to the right or left page margins. The Ruler's horizontal scale shows both margin and indent positions. When you indent a paragraph you specify how far into or out from the margin you wish the text to print. To change a paragraph's indentation, select the paragraph and then drag the appropriate indent marker(s) to the new position. The paragraph itself will then move accordingly.

Indentation is measured relative to the margin, not to the edge of the paper. Be careful not to confuse the document margins with paragraph indents. Each document can have only one user-specified left margin and right margin, but each paragraph in a document may have different left and right indentation positions. Indentation, of course, affects the entire paragraph. When you indent a paragraph, both its alignment and its word wrap are affected, since each line of text now aligns and wraps according to its indent positions.

On the right side of the horizontal scale are two triangles, the first line indent marker and the left indent marker (shown in Figure 8.21). The single triangle on the right side of the horizontal scale is the right indent marker.

MS Word's on-line help, shown in Table 8.3, summarizes the use of the indent markers. You will practice each of these indentation changes in the next Guided Activity.
TABLE 8.3

<table>
<thead>
<tr>
<th>TO INDENT</th>
<th>DRAG THE</th>
</tr>
</thead>
<tbody>
<tr>
<td>First line only</td>
<td>First line indent marker: ▲ (top triangle only)</td>
</tr>
<tr>
<td>Left edge of paragraph</td>
<td>Left indent marker: ¶ (bottom triangle)</td>
</tr>
<tr>
<td>Right edge of paragraph</td>
<td>Right indent marker: ◄</td>
</tr>
<tr>
<td></td>
<td>To move the left indent marker without moving the first line indent marker, hold down the [Shift] key as you drag the left indent marker.</td>
</tr>
</tbody>
</table>

GUIDED ACTIVITY 8.6

Changing Paragraph Indentation

This Guided Activity continues from Guided Activity 8.5. You will change the indentation of various paragraphs, give the report a better title, save, preview, print Long Doc 2, and quit MS Word.

1. Indent the first line of the first grammatical paragraph .5 inch.
   a. Select the paragraph that begins Machines expand....
   b. Point to the first line indent marker. The tip of the pointer must be on top of it.
   c. Drag the first line indent marker to the right along the horizontal scale to the half-inch mark, as in Figure 8.22.

FIGURE 8.22
First line indented one-half inch

Machines expand human powers and skills. Typewriters, pulleys, and automobiles are examples of machines that extend our physical abilities. Computers are machines that expand our mental abilities. Computers can quickly and accurately calculate, sort, and process large quantities of data. They expand our ability to solve problems and to make decisions.†

Each computer needs human instructions to perform its complex tasks. Without instructions, a computer is nothing more than a box of chips. 95% of a computer’s value is in its instructions—its hardware the remaining 5%.†
The first line of the paragraph will move to the right a half inch, and the remainder of the paragraph will wrap accordingly.

Other paragraphs remain unchanged.

2. Adapt step 1 to indent the first line of the paragraph that begins Each computer needs....

3. Simultaneously indent the first line of the two paragraphs following the heading How do You Instruct a Machine?
   a. Shift click to select the two paragraphs.
      Remember, you only need to select part of a paragraph to change its format.
   b. Drag the first line indent marker along the horizontal scale to the half-inch mark.
      The first line of each paragraph will indent.

4. Adapt step 3 to indent the first line of every English paragraph in Long Doc 2 up to the subhead Word Processing on page 3.

5. Adapt step 3 to indent the first line of the last paragraph in the document.

6. Replace Title with a better title.

7. Save.

8. Indent the paragraph following the subhead Word Processing on page 3.
   a. Select the paragraph.
   b. Drag the left indent marker a half inch to the right. Notice that the first line indent marker automatically travels along when you move the left indent marker. The entire paragraph will indent a half inch, and text will wrap accordingly, as in Figure 8.23.

   **FIGURE 8.23**
   Left indentation

   Word-Processing
   Word-processing applications turn the computer into an electronic typewriter to write reports, letters, books, etc. These programs check spelling, change type style and size, save work for another session, and create and print different versions of the same document.

   Spreadsheet

   c. Drag the right indent marker a half inch to the left. The entire paragraph will indent a half inch, and text will wrap accordingly, as in Figure 8.24.
9. Repeat step 8 to indent the paragraphs following these subheads:
   a. Spreadsheet
   b. Database
   c. Graphics
   d. Education
   e. Recreation

10. Save.

11. Preview and print Long Doc 2 if desired.

12. Quit MS Word and end your computing session.

---

**The Ruler Indicates Paragraph Formatting**

New users often complain that the Ruler seems to “jump around.” As long as you remember the basic sequence of Macintosh computing, *select first, then operate*, you will understand why the Ruler changes. Just like the Ribbon, the Ruler indicates the format of the selected passage. Figure 8.25 provides an illustration.

In Unit 7 you used the Ribbon as an indicator to show how characters were formatted. The same principle can be applied to the Ruler. As you move the insertion point from paragraph to paragraph in a formatted document, the Ruler also changes to display the formatting of the selected paragraph(s). Ruler settings reflect the paragraph formatting of the selected paragraph.

Sometimes you will highlight a group of paragraphs with different formats. In that case, the Ruler will gray out to indicate *where* the paragraphs have different formats.
Summary

In Unit 8 you learned to distinguish between the grammatical paragraph and the computer paragraph, and you recognized the significance of this distinction. You practiced different ways to select paragraphs to understand that a mere insertion point selects a paragraph. You changed paragraph line space and alignment with the Ruler’s paragraph format buttons or their keyboard equivalents. You dragged the horizontal scale’s first line, left, and right markers to change paragraph indentation. Finally, you observed that the Ruler is an indicator of the currently selected paragraph’s format.

Command Review

You should know these Macintosh and MS Word commands.

- **Shift click**
  - Actually click at beginning; **[Shift]** plus click at end. This selects a (long) text block without having to scroll from beginning to end.

- **Single space**
  - Click single space Ruler button. This single spaces all lines in selected paragraph.

- **Space and a half**
  - Click one-and-a-half space Ruler button. This sets one-and-a-half spaces between all lines in selected paragraph.

- **Double space**
  - Click double space Ruler button. This sets double spaces between all lines in selected paragraph.

- **Left align**
  - Click left align Ruler button or type **[Shift] [L]**. This aligns all lines of a paragraph against the left margin or indent.
Right align Click right align Ruler button or type \[Shift\]R. This aligns all lines of a paragraph against the right margin or indent.

Center Click centering Ruler button or type \[Shift\]C. This places each line of text equidistant between left and right margin or indent.

Justify Click justify Ruler button or type \[Shift\]J. This divides word space of each line in a paragraph over the breadth of the line so that text lines up against both the left and right margins or indents.

Indent Drag indent marker in from the margin. This moves edge of paragraph in from the affected margin.

---

**Exercises**

The following exercises and questions will strengthen your ability to identify, select and format computer paragraphs.

Practice selecting paragraphs and changing their alignment, indentation, and line space. Shift click to select long text blocks and use keyboard equivalents when appropriate. Each named document is in the Exercises folder in the West Student Data folder on your Data Disk.

After you open each document, Save As its file name plus UB. Type its file name in the center of the header, and your name on the right side. Place a computer-generated date in the center of each footer, with a computer-generated page number on the right. After you make the modifications, Print Preview and Print your work. Don’t forget to proofread the hard copy of your original work.

1. Document: all WOW
   a. Preview the document. How many pages is it? How many Wonders are on each page?
   b. Change the margins. Set the left margin at 1.25 inches, the right margin at 1.5 inches, and the top and bottom margins at 1.25 inches. Now how many pages is the document? How many Wonders are on each page?
   c. Display hidden characters.
   d. Indent and justify the paragraphs under each Wonder, as in Figure 8.26.

---

**Figure 8.26**

Match this paragraph formatting

First Wonder: the pyramids of Egypt

The pyramids of Egypt, in the desert of Giza and Saqqara outside Cairo, were built as monumental tombs for the pharaohs. Built between 2650 and 2500 BC, the pyramids were old before the other six wonders were built. They are the only ancient wonder still standing today.
Now how many pages is the document? How many Wonders are on each page?

e. Center the title.

f. One-and-a-half space the entire document. Now how many pages is the document? How many Wonders are on each page?

2. Document: all WOW (Save As all WOW 2, U8)

a. Experiment with paragraph formatting. Change alignment, line space, and indentation of various paragraphs in the document. Observe their effects both on screen and in the Ruler. When you are pleased with your document, Save and Print it.

b. Open a new document (File/New) and write a brief explanation of why you chose the paragraph formats you used, and how your choices enhance the printed document.

Review Questions

Multiple Choice

1. The grammatical paragraph is usually defined as a series of sentences that develop one topic. The grammatical paragraph depends upon

   a. the Return key
   b. meaning
   c. related topics
   d. the number of words in each sentence

2. The simplest way to determine what is, and what is not, a computer paragraph, is to

   a. display the paragraph marks
   b. count the periods
   c. count the indentations
   d. count the blank lines

3. You can accidentally erase selected text by pressing

   a. ¶
   b. →
   c. ←
   d. any of these
4. To join two paragraphs with different formats, you must first remove
   a. the (hidden) ¶ symbol between the two paragraphs
   b. the last (hidden) ¶ symbol
   c. both hidden paragraph symbols
   d. all hidden paragraph symbols
5. Center-aligned paragraphs have
   a. a ragged right edge
   b. a ragged left edge
   c. ragged left and right edges
   d. both edges lined up to the margins

**True or False**

1. __ Moving the insertion point anywhere into a paragraph selects it.
2. __ The Ruler serves as both a horizontal measurement and a vehicle for setting and changing paragraph formats.
3. __ One paragraph can have two different line-spacing formats.
4. __ The keyboard shortcut for right alignment is Shift R.
5. __ A document has only one setting for its indentations, but it can have many different margins.

**Fill In the Blanks**

Identify the on-screen landmarks in Figure 8.27 and indicate if each is selected or not.

**Figure 8.27**

On-screen landmarks

1. ___________________________  
2. ___________________________  
3. ___________________________  
4. ___________________________  
5. ___________________________
Key Terms

Alignment  Indentation  Paragraph mark
Alignment buttons  Justified  Paragraph selection
Center  Justify  Ragged
Centered  Justify button  Right align
Centering button  Left indent marker  Right align button
Computer paragraph  Left justify button  Right indent marker
Default paragraph format  Left-aligned  Right-aligned
Double space button  Line space  Ruler
End-of-line character  Line space buttons  Shift click
First line indent marker  Nonprinting character  Single space button
Grammatical paragraph  Normal space (mark)  Tab mark
Horizontal scale  Paragraph  Paragraph button strip
Indent
Graphics application programs create computer art—the conception, the modification, and the printing of computer-generated images. The computer displays and manipulates graphical objects according to formal mathematical rules, using mapping and vectors. This may sound very complicated, but it is easy to “paint” and “draw” on the computer. It’s so easy that many preschool children are natural computer artists. Figure 9.1 shows a “painting” produced by four-year-old twins—in their first 45 minutes on the Macintosh. The graphics application they used is called Kid Pix, software that was created by programmer Craig Hickman for his three-year-old son, Benjamin. Kid Pix is available in both public domain (from user groups and bulletin boards) and commercial forms (from Brøderbund software).
The Macintosh's graphical abilities are so popular that even software dedicated to other uses, such as word processing and spreadsheet programs, include graphics modules in their bag of tricks.

Unit 9 introduces you to Macintosh graphics. You will begin by examining the basic kinds of graphics application programs. Next, you will use MS Word's graphics module, *Picture*, to create and to manipulate graphical objects and to integrate graphics into word processing documents. Then, you will use the Scrapbook desk accessory to store images for later use. Finally, you will combine the MS Word, Scrapbook, and Puzzle applications to make and to use custom puzzles.

---

**Learning Objectives**

At the completion of this unit you should know

1. the definition of computer graphics,
2. the distinction between computer painting and drawing,
3. the definition of desktop publishing,
4. that each MS Word graphical image is created and manipulated within its Picture window,
5. the function of each Picture tool,
6. the distinction between internal and external graphics,
7. the function and peculiarities of the Scrapbook desk accessory.

At the completion of this unit you should be able to

1. use the Picture tools to
   a. create simple internal graphics,
   b. import and manipulate external graphics,
2. incorporate pictures into word processing documents,
3. set up and use stationery documents,
4. use the Scrapbook,
5. create custom puzzles.

---

**Graphics Applications**

The original Macintosh came with a graphics application called *MacPaint*. It was MacPaint, as much as the easy-to-use Desktop, that began the Macintosh revolution. Eliminating the constrictions and the difficulty of previous computer
graphics programs, MacPaint presented a whimsical, on-screen collection of familiar artistic tools: a pencil, a paint brush, a spray paint nozzle, and an eraser. Skilled artists quickly were able to produce wonderful “MacPaintings”, and even nonartists could point, click, and drag their way into computer “art.” MacPaint encouraged artistic creativity for everyone.

Paint

Paint programs create graphic images consisting of thousands of tiny square dots, or **pixels**, on the computer screen. The pixels that comprise each painted graphical image—a line, a picture, or a text character—are held in RAM as a matrix or map of bits. (A bit, you remember, is the smallest unit of data the computer can recognize.) Therefore, paint programs are known as **bit-mapped graphics**.

**NOTE**

Bit-mapped graphics are also called raster graphics. A **raster** is a pattern of horizontal scanning lines on a television or computer screen. Dozens of times each second, a tightly focused electron beam follows a zigzag pattern as it moves line by line down the screen. The line pattern causes the monitor to illuminate the correct bits on these lines in order to produce the required characters, curves, patterns, and so on. Since the actual dots that make up the raster image are defined when the graphic is created, the graphic’s resolution is fixed.

Paint programs are interesting and flexible, and they have many special-effect tools. However, as Figure 9.2 shows, painted graphics have definite drawbacks. Painted illustrations look computer-drawn and their lettering is jagged, especially when enlarged.

Painted graphics are difficult to edit. When the computer "paints" an image, the painting application maps the image’s shape on the computer screen as a pattern of square dots. What humans perceive as an individual object, such as an oval or the letter E, the computer recognizes only as a pattern of bits. To alter the overall painted image, the individual bits must be changed. Figure 9.3 shows a bit-mapped letter E.
Another limitation of the original MacPaint graphics was their resolution, or image sharpness on screen or paper. The Macintosh screen has a resolution of 72 dpi or dots per inch: 72 rows of screen dots, or pixels, per linear inch of Macintosh screen. When you print, MacPaint copies the screen image directly onto the printed page—it’s no problem if you are using a 72-dpi dot-matrix printer, such as the Apple ImageWriter. *What you see is what you get!* If you use MacPaint with high-resolution printers, such as 300- to 600-dpi inkjet or laser printers, the results are less than satisfactory. The checkerboard grid of graphics that is acceptable on screen prints jagged and looks computer-drawn, not smooth and fluid, on paper.

**Draw**

*Draw* programs produce object-oriented graphics. Each graphical image consists of discrete objects: lines, circles, boxes, and text characters. Each object can be selected, moved, formatted, and edited independently. Drawing programs are also called vector graphics after the mathematical formulas that describe the shape that makes up each object. When you display or print a vector graphic, its formulae are converted into visible patterns of dots. Since the dots are not specified until the graphic is displayed or printed, the image’s size can be changed without any loss of quality, and the image will always appear at the highest resolution of the screen or printer you are currently using.

Drawing programs offer fewer tools, but drawn graphics are of high quality when laser printed. Figure 9.4 shows the same oval and label as Figure 9.2, drawn instead of painted.

**PostScript Graphics**

*Encapsulated PostScript*, or EPS applications, form a third category of graphics applications. High-end graphics programs, such as Adobe Illustrator or Aldus Freehand, use the special graphical computer language called *PostScript* to
combine the resolution capabilities of drawing programs with the flexibility of painting programs. EPS graphics are beyond the scope of this introductory text.

**Desktop Publishing**

*Desktop publishing applications* are hybrids. Combining word processing and graphics, desktop publishing applications make the personal computer an inexpensive production system that generates typeset-quality text and graphics. PageMaker, QuarkXPress, FrameMaker, and ReadySetGo! are examples of dedicated desktop publishing software. However, with the merging of text and graphics into the same document, full-featured word processing programs with graphics modules like MS Word or WordPerfect for the Mac may also be considered low-end desktop publishing applications. (However, neither WS Word nor WordPerfect have the same ability to handle graphics or manipulate text that the dedicated desktop publishing applications do.) MS Word's graphics module, **Picture**, provides a collection of high-resolution, easy-to-use drawing tools. With these tools you can create, edit, and format graphic images to incorporate into your word processing documents. Therefore, in a very limited sense, Unit 9 teaches you something about desktop publishing as well as graphics.

---

**Picture**

MS Word's Picture is a **module**, a program within a program. Whenever you choose Picture, the command deactivates MS Word and loads and activates the Picture module. The Picture module opens to display its Picture window, shown in Figure 9.5. MS Word remains in the background, underneath the Picture window. As long as the Picture window is open, the main program is inactive, and you can only use Picture commands.

![Picture window](image)
The Tool Palette

Most Picture commands are found in the tool palette, a collection of tool buttons on the left side of the Picture window (see Figure 9.5). These Picture tools let you create and manipulate simple geometric shapes, such as lines, ovals, and rectangles, and add text to your picture.

Drawing Tools

The Picture tools can be categorized by function. Some tools let you draw, and others let you manipulate existing objects. Several of the tools, called drawing tools, let you create simple geometric shapes. Figure 9.6 shows these drawing tools.

GUIDED ACTIVITY 9.1

Using the Drawing Tools

Guided Activity 9.1 introduces you to the Picture window and the Picture tools. You will open a new MS Word document, open the Picture window, get Balloon Help, and then use each of the drawing tools. Begin at the Desktop.

1. Open MS Word.

2. Click the Picture button on the right side of the Ribbon to display the Picture window. The blank Picture window appears. The window is titled Insert Picture. This indicates that it will insert the image you draw into your document when you close its window.

3. Read the Help Balloon for each Picture tool to provide an overview for this Guided Activity and the others that follow. Picture tools let you draw and modify the elements that make up an image.
   a. Choose Help/Show Balloons.
   b. Point to each tool and read its balloon; begin in the upper-left corner of the tool palette.
   c. Choose Help/Hide Balloons.

4. Draw a line. When you draw on the computer, you use a drawing tool to create a graphical object. Microsoft calls these objects elements.

   The line tool draws straight lines.
These lines may appear somewhat jagged on the Macintosh screen, but they will straighten out when printed on a high-resolution printer. Figure 9.7 shows the distinction.

a. Click the line tool to select it. It will highlight.

b. Point anywhere within the Picture window itself.
   The pointer changes shape, becoming a *cross pointer*.
   The cross pointer indicates that the pointer is ready to let you draw.

c. Point to somewhere in the upper-left corner of your screen.

d. Drag diagonally, simultaneously moving the mouse down and to the right.
   A line will appear in the picture window that mimics your mouse movements.

e. Release the mouse button.

The line is an element, a drawn object. As shown in Figure 9.8, the line has *handles*, small rectangles at either end. These handles indicate that the line is selected. It can be resized, moved, deleted, or otherwise manipulated.

f. Press the [Delete] key to delete the line. The [Delete] key deletes selected graphical elements from the Picture window.

5. Draw a rectangle. The *rectangle tool* draws rectangles.

   a. Select the rectangle tool. (Click it.)

   b. Point to the upper-left corner of your screen. Observe the cross pointer.

   c. Drag diagonally, as you did to make the line. The same diagonal action that produced a line now produces a rectangle. The rectangle begins where you pressed and ends where you released the mouse (see Figure 9.9).
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The selected rectangle has eight handles.

d. Delete the selected rectangle. (Press the \texttt{Delete} key.)

6. Draw a square. By holding down the \texttt{Shift} key as you draw, you \textit{constrain} or limit the object's range of motion. When you constrain the rectangle tool, it draws only squares.

   a. Hold down the \texttt{Shift} key.

   b. Draw a rectangle as you did in step 5. With the \texttt{Shift} key down, draw a square instead.

\textbf{FIGURE 9.10} A selected square

Press

Release

When selected, a square has four handles (Figure 9.10); a rectangle has eight (Figure 9.9).

c. Delete the selected square.

7. Draw a rounded rectangle. The \textit{rounded rectangle tool} draws rectangles with rounded corners. When constrained, it draws rounded squares.

   a. Select the rounded rectangle tool.

   b. Drag diagonally to draw a rounded rectangle.

\textbf{FIGURE 9.11} A rounded rectangle, selected and deselected

When the rounded rectangle is selected, its handles obscure the rounded corners as in Figure 9.11, left.

c. Delete the selected rounded rectangle.

8. Draw an oval.

The \textit{ellipse tool} draws ellipses, or ovals. When constrained, it draws circles.

   a. Select the ellipse tool.

   b. Draw an oval using the same diagonal motion you have used before.
The selected oval has four handles on the oval’s perimeter, as in Figure 9.12. It also has four handles beyond it that form a rectangle outside the oval. The upper-left handle shows where you pressed the mouse button, and the lower-right handle where you released it.

c. Delete the selected oval.

9. Draw a polygon.

Polygon lines appear jagged on screen, but print well on high-resolution printers.

The **polygon tool** draws straight-sided, irregular elements.

a. Choose the polygon tool.

b. Click the location of the polygon’s first corner, A in Figure 9.13.

c. Point to corner B.

A line follows the cross pointer as you move it from corner to corner.

d. Click corner B.

e. Click corners C, D, and E.

f. Click corner A again to close the polygon.

You must click the first corner after the last corner to free or to release the polygon tool.

g. Delete the polygon.

10. Adapt step 9 to draw the polygon in Figure 9.14.
Polygon lines can intersect each other, creating interesting elements.

11. Draw an arc.

The arc tool draws arcs, segments of ovals and circles.

a. Select the arc tool.

b. Drag diagonally from upper left to lower right and release.

Figure 9.15 shows where to press and to release to draw its arc.

Look at these handles! An arc is a segment of an ellipse or circle. The handles define the perimeter of an invisible rectangle that surrounds what would be the entire ellipse or circle.

c. Delete the arc.

12. Leave the Picture window open for the next Guided Activity.

**Formatting Tools**

By themselves, lines, arcs, and geometric shapes are not very exciting. However, the Picture tool palette does provide a variety of ways to format these objects. To format an object, you select it then use formatting tools to change the element’s appearance. You can change a line’s width, color, and pattern, and add arrowheads to either or both ends. You can change both a geometric shape’s outline and its interior pattern, called a *fill pattern*. Figure 9.16 shows some of the many format possibilities within the Picture tool palette.
GUIDED ACTIVITY 9.2

Formatting Drawn Elements

Guided Activity 9.2 continues from Guided Activity 9.1. You will create elements, and change their line widths, colors, arrows, and fill patterns. Begin with a blank Picture window.

1. Draw a line an inch long. As you draw, the status area at the bottom of the Picture window provides the element's dimensions, as shown in the bottom of Figure 9.17.

![Figure 9.17 Status area](image)

2. Deselect and select the line.
   a. Select the selection tool.

   The selection tool selects, moves, and resizes graphical elements. When the selection tool is selected, the pointer has its arrow shape.

   b. Click anywhere in the blank area of the Picture window to deselect the line. The deselected line has no handles. Figure 9.18 differentiates between a selected and a deselected line.

![Figure 9.18 Selected and deselected lines](image)

   c. Click the tip of the arrow pointer on the line to select the line.

3. Make the line wider.

   Line width describes a line's thickness, or the thickness of the line around the perimeter of a geometric shape. The line width tool displays the line width of a selected object within its rectangle. When pressed, the line width tool pops out a menu of line width choices.

   a. Press the line width tool to see the line width menu, Figure 9.19.

   The current line width has triangles at either side, like the line in the tool rectangle itself.
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b. Choose the thickest line width.

i. Drag to the right to reach the line width menu, and then drag down until the bottom line has triangles on either side, as in Figure 9.20.

ii. Release the mouse button. The line widens and the tool palette display box at its bottom (Figure 9.21) also widens, to show the line and fill widths, colors, and patterns that you have last selected.

4. Format the line’s color and pattern. Each line’s color and pattern can be formatted separately. First, you select the line; then, you choose its color and its pattern from the line color palette and line pattern palette pop-up menus.

a. Press the line color palette tool. The line color palette tool (shown in Figure 9.22) displays a menu of color choices. These colors format lines, the borders of geometric shapes, and text that you create with the text tool. Your color choices depend upon how your monitor is set. When the monitor is set to black and white (the only choice on most compact Macintoshes), menu line colors are written because you cannot distinguish among them visually on screen.

When the monitor is set to gray scale, your choices are a series of white, gray, and black boxes. When the monitor is set to color, you may choose from a series of colored boxes. Unless you have a color printer, however, colored graphics you create in the Picture window will be printed in black and white (and gray with a high-resolution printer).
b. Choose a color you like from the line color palette menu. Both the line and the tool palette display box will change to reflect your choice.

**NOTE** *Do not choose white. It won’t show up on the Picture window’s white background.*

c. Format the line’s pattern. The *line pattern palette* contains many patterns from which to choose. These patterns can format lines, but not text.

d. Select the line.

e. Press the line pattern palette to see the pattern palette menu.

The chosen pattern has a solid box around it. In Figure 9.23, the solid surrounds the chosen solid box. Because this box is slightly larger than the others, you can tell it is selected.

f. Drag onto a different pattern to choose it, as in Figure 9.24, and then release the mouse.

Both the line’s pattern and the tool palette display box will change to reflect your choice (as in Figure 9.25).
5. Give the line an arrowhead. The *arrowhead tool* places an arrowhead at either or both ends of a line. The tool also removes arrowheads from lines that have them.

   a. Select the line.

   b. Press the arrowhead tool to see the pop-up menu shown in Figure 9.26. The selected line style is highlighted.

   c. Drag over and down to choose the right-pointing arrowhead. Nothing on the tool itself indicates that you have chosen an arrowhead, but the line develops an arrowhead, as shown in Figure 9.27.

6. Draw a square, an inch square, below the arrow. Hold down the [Shift] key to constrain your rectangle to a square, and check the status area for the element’s dimensions as you draw. Your drawing should now resemble Figure 9.28.

7. Deselect and select the square.

   a. Click anywhere in the blank area of the Picture window to deselect the square. The deselected square has no handles. Figure 9.29 shows the difference between a selected and a deselected square.
b. Click the square to select it. The pointer’s hot spot, or tip, must be directly over one of the sides of the square when you click, as in Figure 9.30.

8. Format the selected square.
   a. Choose the second widest line width.

When you change the line width of a geometric element, it does not change the element’s overall size. The line widens inwardly, as in Figure 9.31.

b. Change the square’s fill pattern.

   Fill pattern is the pattern with which an element is filled. The fill pattern palette tool resembles the line pattern palette tool; the resulting choice fills the element’s interior rather than its line.

   i. Press the fill pattern palette tool.
   ii. Choose a fill pattern you like. The resulting fill pattern will fill the interior of the square as in Figure 9.32, and shows in the tool palette display box.

9. Save your work.
   a. Close the Picture window. Your picture will be contained within a frame in the Untitled word processing document, as in Figure 9.33.
b. Save As Picture 1 on your data disk.

**NOTE** The Save command is gray (dimmed, disabled) when the Picture window is open. When you work on a complex graphic, it is a good idea to close the Picture window and save your document from time to time. Then, once the document is saved, double-click inside the Picture frame to continue drawing.

10. Quit MS Word.

**Manipulation Tools**

Once you have drawn an element, you probably will want to move it, change its size, or both. To move or resize an element, you use the selection tool, as in Guided Activity 9.2.

Each element must be selected before it can be changed. When selected, it has handles. Dragging an element moves it. Dragging its handle resizes it. The selection tool can move elements individually, or in groups.

The tool palette has a **group tool**. It lets you group together elements to manipulate them as a unit with a single set of handles, and to ungroup them to edit individually.

**GUIDED ACTIVITY 9.3**

**Moving, Resizing, and Grouping Elements**

Guided Activity 9.3 uses the picture you created in Guided Activity 9.2. You will move and resize the arrow and the square, group them, duplicate them, and manipulate the duplicates in various ways. Begin at the Desktop.

1. Double-click the Picture 1 document icon.

2. Double-click within the picture frame (Figure 9.32) to open its picture window. The Picture window is now titled **Edit Picture**.

3. Move the arrow.
   a. Choose the selection tool.
   b. Select the arrow. Position the tip of the pointer on any part of the arrow other than its arrowhead and handles, as in Figure 9.34.
   c. Drag the arrow to the right side of the square. Only the element’s outline moves until you release the mouse button. Your arrow and square should now resemble Figure 9.35.
4. Resize the arrow.
   a. Make sure it is still selected (has handles).
   b. Position the pointer’s hot spot on the handle at the tip of the arrowhead, as in Figure 9.36.
   c. Drag the handle about an inch to the right, to double the length of the arrow. The status area will reflect the element’s growth.

   If the arrow element moves instead of grows, the pointer tip was not on the handle.

5. Shrink and format the arrow.
   a. Select the arrow.
   b. Change its line width to the third width down. The arrowhead also reduces in size.
   c. Resize the arrow so that it is only an inch long.
   d. Change its line pattern to solid (black).
   e. Place an arrowhead on either side of the line.

6. Rotate the arrow 45°.
   a. Rotate the arrow exactly 45°. The rotation tool allows you to turn a selected element on its axis. When you rotate an object, you can monitor its rotation in the status area. Rotation does not change an object's size.
   b. Click the rotation tool. The pointer becomes a wheel.
   c. Place the center of the rotation wheel over the arrow’s left handle, drag the handle down and right until the status area says 315°, and release the mouse button. (360°−45°=315°). Only the outline will move until you release the mouse (see Figure 9.37).
When you are done, the arrow should look like Figure 9.38. Remember, the arrow will be jagged on screen, but will print smooth.

**NOTE**  
If you do not have the rotation wheel directly over the handle when you press, the rotation tool deselects and the selection tool selects. Click the rotation tool and try again.

7. Resize and reformat the square.
   a. Click the square to select it. The arrow deselects.
   b. Point to the square’s lower-right handle.
   c. Drag the handle up and left until the status area says the square is a half inch in width and height. In Picture, \texttt{Shift} does not constrain a square as you resize it, only when it is first drawn.
   d. Change the square’s fill pattern to one of the gray textures, and give it the thinnest line width.
   e. Deselect the square.

8. Move the square.
   a. Press the square anywhere but on a corner.
      
      When an element is filled, you can drag it by its filled area or by its line. However, you can only drag an unfilled object by its line.
   b. Drag the square to a new location. Only its outline will move until you release the mouse button.

9. Duplicate the arrow. To \textit{duplicate} or make an exact replica of an element, you could select the element, copy it, and paste it. However, it is faster to use the tool palette’s \textit{duplication tool}.
   a. Select the arrow element.
b. Click the duplication tool. A second selected element will appear to the right and down from the original, as in Figure 9.39.

10. Flip the duplicate arrow. You could drag the duplicate arrow by one of its handles until it faced the opposite direction, carefully checking the status bar to be sure you maintained its original length. However, it is much faster and more accurate to flip it with the flip tool. Figure 9.40 shows the Flip Tool menu.

*Flip horizontal* rotates an object side to side on a vertical axis. *Flip vertical* rotates an object upside down on a horizontal axis. In case you don’t like flip results, Undo All Flips and Rotations restores it to its original orientation.

a. Select the duplicate arrow if not already selected.

b. Press the flip tool to see its menu.

c. Choose Flip Horizontal. Your arrows should resemble Figure 9.41.

11. Drag the duplicate arrow over the original until the two arrows form an X, as in Figure 9.42, and deselect.

**NOTE** As you drag, be careful not to select an object by one of its handles, or you will resize the object instead of changing its location.

For precise positioning, use the keyboard’s arrow keys instead of the mouse once the object is almost in the correct spot. Each arrow key moves the selection one pixel, or screen dot, in the direction it points every time it is pressed.
12. Group the arrows into a single unit.
   
   a. Place a selection marquée around both arrows.
      
      This is the fastest way to select a group of elements that are near each other.
      
      i. Point to the top and left of the left corner of the X. Be sure that the tip of the pointer does not touch any element, or you will select and drag that element instead of making the marquée. Figure 9.43 shows the correct beginning position.
      
      ii. Drag diagonally down and right.
           
           As you drag, a small box with dotted edges will appear. This box is the marquée.
           
           iii. Drag until the marquée completely surrounds the arrows as in Figure 9.44.
           
      iv. Release. The marquée vanishes, but any elements whose handles were completely within its boundaries are selected.
   
   b. Group the arrows.
      
      i. Press the Group tool to see its menu, shown in Figure 9.45.
      
      ii. Choose Group Selection. Now the arrows can be selected and moved as a single element.

13. Drag the arrows on top of the square.

14. Select and group the arrows and the square.

15. Drag the group to the upper-left corner of the Picture window.

16. Shrink the group so that it is only three-quarters of an inch in either direction. A group can be resized all at once, as if it were a single element.
17. Duplicate the group twice. As you can see from Figure 9.46, it's starting to look like a kite.

FIGURE 9.46
Duplicate the group twice to form a kite

18. Close the Picture window.

19. Save and Quit.

The Text Tool

A text element, text object, or text block is a unit of text that is part of an image. Text elements can only be drawn, manipulated, and deleted within the picture window and not from the main MS Word window. Text block formatting has definite limitations. Every character in a text block must be formatted uniformly; you cannot bold or resize individual characters or words. You can only change character format from the pull-down menus or their keyboard equivalents; you cannot use the Ribbon in conjunction with the Picture window.

Text elements do not wrap the same way as the word processor; Picture wraps text character-by-character rather than word-by-word. But, as Figure 9.47 shows, you can do some pretty spectacular things with text blocks that you cannot do within the main word processing program.

FIGURE 9.47
Text special effects

GUIDED ACTIVITY 9.4
Using the Text Tool

Guided Activity 9.4 continues from Guided Activity 9.3. You will use the text tool to create a textual tail for your kite. In the process, you will learn how to create, to edit, to format, and to rotate a text block. Begin at the Desktop.

1. Double-click the Picture 1 document icon.

2. Double-click within the picture frame (Figure 9.32) to open its picture window.

3. Select the text tool. The text tool draws, edits, and formats text elements.
4. Draw a text element. Draw the word Kite.
   a. Select the text tool.
   b. Point in the Picture window.
      The mouse pointer becomes an I-beam, indicating that you can now create
      and select text.
   c. Click the Picture window below the graphic. When you select the text tool
      and click within the Picture window, you set a blinking insertion point at
      that spot.
   d. Type the phrase Kite.
      This text element can now be edited, formatted, and manipulated both textu-
      rally and graphically.

5. Edit the phrase Kite to the all caps KITE. The text tool must be selected to use
   the I-beam pointer. As everywhere else on the Macintosh, text must be selected
   before it can be edited.
   a. Drag the I-beam across ITE to select these characters. Don’t worry if the
      highlighted area extends beyond the words themselves as, in Figure 9.48.
   b. Type ITE.

6. Format KITE to bold, Avant Garde, 18 point, and centered.
   a. Click the selection tool, and then the text block. The selected text block has
      handles like other graphical elements.
      Since every character in a text block must be formatted the same way, you
      can select text blocks with the selection tool instead of with the text tool; it’s
      easier.
   b. Choose Format/Bold (⌘B).
      The text block becomes bold.
      Bold characters are wider than plain text, so your text element wraps to
      two lines.
   c. Stretch the text block so that all the characters are on one line.
      i. Point to one of the side handles.
      ii. Drag out slightly until all the text fits on one line. Only the text block out-
          line expands until you release the mouse.
d. Shrink the text block top to bottom, so that its handles do not fill blank space. Avoid larger text blocks than you need. These invisible areas can accidentally become selected as you move graphical elements around.

e. Choose Font/Avant Garde to change the font.

f. Choose Font/18 point to enlarge the type.

g. Center the text in the text block.

i. Press the text alignment tool.

The text alignment tool lets you left align, center align, or right align a text block within its handles. Figure 9.49 shows how text may be aligned within a text block.

ii. Choose Align Center. The keyboard equivalents also work: \[ Shift \] L, \[ Shift \] C, and \[ Shift \] R.

7. Drag the text block under the kite image, as shown in Figure 9.50.

8. Resize the text block so that it is long and skinny, with only one character per line. The status area will show approximately width 0.17, height 1.03.

9. Rotate the text block.

a. Click the rotation tool.

b. Place the center of the rotation wheel over the text block's bottom right handle, and drag the handle up and right until the status area says 315°. Only the outline will move until you release the mouse.

10. Click the selection tool and drag the rotated text block into position, forming the kite's tail. The rotated text looks faint, but prints fine.

11. Close the Picture window.

12. Save and print your kite image.

13. Edit the kite image if necessary.
a. Double-click the kite image in its frame to open its window.

The Picture module has a *bug*, a part of the program that doesn’t work correctly. When you reopen the Picture, the rotated text block changes dimensions, so that the I and T are on the same line.

To remedy, press the flip tool and choose Remove all Flips and Rotations. Choose the text tool, and press (Return) after each letter, so that each letter is on a separate line. Choose the rotation tool, and rotate the text block back in position. Now the letters will stay in place.

b. Make adjustments, and reclose the picture window. Figure 9.51 shows the finished kite.

14. Quit MS Word.

**Internal and External Graphics**

The kite you drew is an *internal graphic*: you created it entirely within the Picture window. Often, it is easier to bring an already-created image into MS Word than it is to draw it yourself. Graphics that are created outside a given application and brought in are called *external graphics*. You can either create external graphics yourself, or purchase professionally made images. *Clip art* is a collection of external images stored on disk to use in programs such as MS Word. Many software companies sell clip art. A nice collection of bit-mapped (72 dpi) images is WetPaint™ from Dubl-Click Software. Four of their images are available for you in the Letterhead Graphics file in the West Student Data folder.

**GUIDED ACTIVITY 9.5**

**Using External Graphics**

Guided Activity 9.5 shows you how to incorporate an external image into a word processing document. You will open the Letterhead Graphics file, copy a clip art image to the Clipboard, and Paste it to a new word document. You will then customize the image within the Picture window, and incorporate the Picture into
your own personalized stationery. Begin at the Desktop with your Data Disk mounted.

1. Open the Letterhead Graphics document. The document opens to show four WetPaint pictures, each enclosed in its own picture frame.

2. Click the frame containing the desktop image to select the picture. The frame will have handles, as in Figure 9.52.

![Figure 9.52: Selected picture](image)

Do not double-click; that will open the frame to the Edit Picture window.

3. Choose Edit/Copy (⌘C) to copy the entire Picture into the Clipboard.


5. Choose Edit/Paste (⌘V) to paste a copy of the Picture into the new document.

6. Place your name into the image.

   a. Double-click inside the Picture frame to open its Edit Picture window, as shown in Figure 9.53.

![Figure 9.53: Edit Picture](image)

   b. Select the text tool.

   c. Click the I-beam below the desktop image to start a new text block.
You'll have fewer problems if you create and edit text blocks in a blank part of the window and then position the completed text block relative to the external image.

d. Type your name.

e. Select the text block and format the text as you choose.

   "From the desktop of" is in 12-point Chicago.

f. Drag the text block into position on top of the image. Position the text block as you like.

g. Close the Edit Picture window. The edited image will be in its frame.

7. Center the image on the page. Envision each MS Word picture frame as a character. The frame in Figure 9.54 forms its own paragraph.

   a. Place an insertion point between the right edge of the frame and the ¶. The insertion point will be very tall, because of the width of the image.

   b. Press Return. Now you have two paragraphs, both left justified.

c. Click the image to select the first paragraph.

d. Center the paragraph (§Shift©). Your completed letterhead should resemble Figure 9.54.

8. Save your stationery as a stationery file. A stationery file always opens Untitled, preserving the original.

   a. Choose File/Save As.

   b. Name the file My Stationery.

   c. Press the down arrow below and to the right of Save File as Type to see the drop-down file type menu, like the one shown in Figure 9.55.

   d. Choose Stationery.

   e. Click Save. Your document window will still say Untitled.


   a. Quit MS Word.
b. Click No when the dialog box asks if you want to save any changes.

c. Double-click the My Stationery file on your Data Disk (West Student Data folder) to reopen it. The file opens Untitled, preserving the original.

From here, you could either use your stationery to write a letter, or repeat steps 9 a–b to Quit.

Stationery Files

Guided Activity 9.5 led you through the steps of stationery file creation. Let us explore stationery files in more depth.

Suppose you write a memo every week. Each week’s memo follows the same layout; your company logo at the top, your name, date, and so on. To save yourself time, you can create a memo template, a pattern document that contains all the graphics, repeated text, and formatting specifications for your memo. Beginning each week’s memo with the same template helps your memos to maintain a consistent format and appearance.

In MS Word, any document can become a template simply by saving it as stationery, the Macintosh synonym for template. Whenever you open a stationery document, you actually open an Untitled copy of the document—not the original file. Stationery files let you start with a fresh original each time, and prevent you from accidentally mutilating the template itself.

If you need to change the actual template, open a stationery copy, make the required changes, and choose File/Save As. When the dialog box opens, save the file type as Stationery, give the file the exact name and destination as the original, and click Save. Another dialog box will appear, like the one in Figure 9.56, asking if you wish to replace the existing file. Click Replace to update your stationery file.
Sometimes it is easier to change an existing document into a template at the Desktop rather than from within MS Word. The Finder (System 7 only) allows you to make any document a template. Follow these steps.

1. Select the document icon you wish to make into a template, memo template in this example.

2. Choose File/Get Info to display its information box, Figure 9.57.

3. Click to put an X in the square to the left of Stationery pad. If the information box does not have this option, the icon you selected is not a document.

4. Close the information box. The document icon changes to reflect that it is a template.

To remove the template option, open the stationery document's information box, click to remove the X from the square next to Stationery pad, and close the information box.

The Scrapbook

The Clipboard lets you move information from one place to another, but with limitations. The Clipboard only holds one item at a time, and it empties when the power turns off. An alternative to creating stationery files as you did in Guided Activity 9.5 is to store letterhead images in the Scrapbook and then copy them to other documents as needed. Let us examine the Scrapbook in more detail.
The Scrapbook desk accessory creates a file, called the Scrapbook file, in which it stores frequently used text and images for later use. Each selection is stored on its own page. The Scrapbook file can hold as many pages as storage allows. Figure 9.58 shows a Scrapbook page, displaying the “from the desktop of” clip art that you just used.

The Scrapbook window is not like other Macintosh windows. You can’t shrink or enlarge it, and it has no vertical scroll bar. The horizontal scroll bar does not show hidden parts of the current page, but rather scrolls from one Scrapbook page to another. The Scrapbook displays only the center of a large picture or text selection, but stores the whole thing. Strange....

The way into and out of the Scrapbook is through the Clipboard. Figure 9.59 outlines the process of copying a graphic from the file named letter onto the Clipboard, pasting the graphic from the Clipboard into the Scrapbook for storage, and then copying the Scrapbook graphic onto the Clipboard to paste it into another file named letter 1.

The Clipboard is the place in RAM that holds individual selections temporarily as part of the transfer process; the Scrapbook is the storage file capable of holding multiple selections from one computing session to another. It will make more sense if you try it.
GUIDED ACTIVITY 9.6

Using the Scrapbook

In Guided Activity 9.6 you will modify one of the images in the Letterhead graphics file to create a custom letterhead, and place it in the Scrapbook for future use. Then you will copy your custom image from the Scrapbook onto a new MS Word document for use. Begin at the Desktop with your Data Disk inserted. Figure 9.60 shows two examples of custom graphics.

1. Open the Letterhead Graphics file in the West Data folder on your Data Disk.
2. Copy a different image than you used in Guided Activity 9.5 into the Clipboard.
5. Paste the image onto your new document.
6. Open the Edit Picture window.
7. Customize your image. Figure 9.60 gives two examples.
8. Close the Picture window.
9. Select and copy the Picture. It is now in the Clipboard. Open the Clipboard to verify, if you wish.
10. Choose ⌘/Scrapbook to open the Scrapbook file.
11. Click the Scrapbook window’s horizontal scroll bar to view other Scrapbook pages. Each Scrapbook file will have different contents.
12. Choose Edit/Paste (COPY) to paste the contents of the Clipboard into the Scrapbook.

13. Close the Scrapbook window.

14. Quit MS Word. Save no changes. This is what your situation would be if you were to quit for the day, and return to the same computer next week.

15. Open the Scrapbook (step 10).

16. Turn the pages until you locate the page with your letterhead image.

17. Choose Edit/Copy (COPY). A copy of the image is now in the Clipboard.

18. Open a new MS Word document.

19. Paste the image into the document. From here you may either use the image to write a letter, or you may quit without saving changes.

GUIDED ACTIVITY 9.7
Customizing Puzzles

Guided Activity 9.7 provides more Scrapbook/graphics practice. First, you will Copy and Paste the scrambled Puzzle into the Scrapbook to see what the Puzzle looks like when solved. Then you will Copy and Paste an image from the Scrapbook into the Puzzle to create a custom Puzzle. Begin at the Desktop.

1. Open the Puzzle.

2. Choose Edit/Copy (COPY) to copy the Puzzle image to the Clipboard.

3. Open the Scrapbook.

4. Choose Edit/Paste. The puzzle image appears in its completed form in the Scrapbook window.

5. Click the Puzzle window, and choose Edit/Clear to see the number Puzzle.

6. Copy and paste the number image to the Scrapbook to see its completed form.

7. Open the Puzzle Graphics file in the West Student Data folder. It contains four images suitable for puzzles.

8. Copy the Scottie image into the Clipboard.

9. Quit MS Word.

10. Paste the Scottie image into the Scrapbook.

11. Copy and paste the Scottie image into the Puzzle (see Figure 9.61).

12. When you finish playing with the Scottie Puzzle, select Edit/Clear to return the Puzzle to the Apple logo.
13. Use the other Puzzle images to create other puzzles. Once the images are in your Scrapbook, you can Copy and Paste them into other documents as well.

**GUIDED ACTIVITY 9.8**

**Removing Scrapbook Items**

If you use graphics often, your Scrapbook can become very crowded. Guided Activity 9.8 shows you how to remove unneeded pages from the Scrapbook.

**Note** If you work in a computer laboratory, please remove all images you have added to the Scrapbook.

1. Choose /Scrapbook to display the Scrapbook window.
2. Click the Scrapbook’s horizontal scroll bar until you display a page you wish to remove.
3. Choose Edit/Cut to remove that page from the Scrapbook.

Cut keeps a copy of the page in the Clipboard until the next time you copy or cut something. If you accidentally remove a page you meant to keep, choose Edit/Paste to replace the page. Undo does not work, even though its menu item is not dimmed.

Choose Edit/Clear to remove a page from the Scrapbook *permanently*. Since clear does not place a copy of the page into the Clipboard, you cannot paste an accidentally deleted page back into the Scrapbook.

4. Repeat steps 2–3 until you have removed all unnecessary pages in your Scrapbook.
5. Close the Scrapbook window.

**Summary**

Unit 9 introduced you to computer graphics. You began with terminology. You distinguished between bit-mapped and object-oriented graphics, and understood why object-oriented graphics have better resolution. You found that desktop publishing applications use the computer to produce high-resolution text and graphics.
You understood the distinction between internal and external graphics, and the purpose of clip art.

Next, you used the MS Word drawing module, Picture. You drew objects (elements), then formatted and manipulated them in various ways. You modified external graphics and incorporated them in word processing documents.

At the end of the unit, you placed graphics into the Scrapbook to keep for future computing sessions, pasted graphics from the Scrapbook onto the Puzzle to make custom Puzzles, and removed unwanted pages from the Scrapbook.

Unit 9 demonstrates the versatility of Macintosh graphics in enhancing written work—and shows how much fun it is to be a computer "artist."

Command Review

You should now know these Macintosh and MS Word commands.

**Draw**  
Use a drawing tool to create a graphical object (element), such as a line, a rectangle, an oval, a polygon, an arc, or a text block.

**Select an object**  
Click the selection tool and then the object.

**Choose a line width**  
Select an object. Press the line width tool to see the pop-up menu and Drag to the line width of your choice.

**Choose a color**  
Select an object. Press the line or fill color tool to see the pop-up menu and Drag to the color of your choice.

**Choose a pattern**  
Select an object. Press the line or fill pattern palette tool to see the pop-up menu and drag to the pattern of your choice.

**Group objects**  
Select two or more objects, press the Group tool and choose Group Selection. This allows the grouped objects to be selected and moved as a single object.

**Ungroup objects**  
Select the group, press the Group tool and choose Group Selection. This removes grouping from objects so that they can be selected and manipulated individually.

**Rotate an object**  
Select the object. Click the rotation tool. Drag one of the handles in the direction you wish to rotate. When you release the mouse, the object will rotate.

**Save As Stationery**  
Choose Stationery from the drop-down Save File As/Type menu in the Save As dialog box. The stationery file opens as Untitled, preserving the original.

**Clear**  
Choose Edit/Clear. This removes the selection without placing its replica into the Clipboard.
Exercises

1. Create internal graphics using MS Word’s Picture module. Approximate each of these drawings. Feel free to modify (improve) them as you like. The front/back tool, not used in Unit 9 Guided Activities, may help you arrange the objects (elements). Figure 9.62 shows its online help description.

**FIGURE 9.62**

Front/back Switch the order of stacked elements. Bring To Front moves selection to the front of the stack; Send To Back moves it to the back.

**a.** Use the line tool, the duplication tool, the selection tool, the ellipse tool, the line width tool, and the fill pattern tool to create this image. *(Hint: fill the half note with white fill to make it opaque.)*

![Image of music notes]

**b.** Use the rectangle tool, the ellipse tool, the line width tool, the fill pattern tool, the duplication tool, the selection tool, and the text tool to create this image.

![Image of a t-shirt with text]

**c.** Use the polygon tool, the ellipse tool, the line width tool, the fill pattern tool, the selection tool, and the rotation tool to create this image (page 235). *(Hint: You cannot resize rotated objects. Use the flip tool menu to remove all flips and rotations if you need to resize.)*
d. Use the ellipse tool, the arc tool, the line width tool, the fill pattern tool, the selection tool, the rotation tool, and the flip tool to create this image.

e. Create your own internal graphic.

2. Use one of the internal graphics you created in Exercise 1 to make another custom puzzle.

Review Questions

Multiple Choice

1. Draw programs’ advantages include
   a. high print quality
   b. objects can be resized without becoming jagged
   c. editing and formatting ease
   d. all of these
2. Desktop publishing is
   a. the merging of text and graphics into the same application
   b. an inexpensive typeset production system
   c. possible using MS Word
   d. all of these

3. Handles
   a. indicate that an object or group is selected
   b. don’t allow you to move that object or group
   c. don’t allow you to resize an object
   d. all of these

4. When you Save a document as Stationery
   a. you store the document as you designed it
   b. the original file stays on disk
   c. the program opens a copy of the original for you to use, and names it *Untitled*
   d. all of these

5. Clip art
   a. is internal graphics
   b. comes from the Clipboard and cannot be saved
   c. is created by professional artists
   d. all of these

**True or False**

1. **___** The Picture module enables you to add graphics to word processing documents.

2. **___** Graphics programs allow everyone to produce professional quality art.

3. **___** Drawn objects cannot be moved.

4. **___** The Picture module can both create its own internal graphics and use external graphics such as those stored in the Scrapbook.

5. **___** Scrapbook pages can be reused.
**Fill In The Blanks**

Identify these Picture tools.

1. _______________________
2. _______________________
3. _______________________
4. _______________________
5. _______________________
6. _______________________
7. _______________________
8. _______________________
9. _______________________
10. _______________________  

**Key Terms**

Arc tool  
Arrowhead tool  
Bit-mapped  
Bits  
Bug  
Clip art  
Constrain  
Cross pointer  
Desktop publishing application  
Dots per inch  
Dpi  
Draw  
Drawing tools  
Duplicate  
Duplication tool  
Element  
Ellipse tool  
Encapsulated PostScript  
EPS  
External graphic  
Fill pattern  
Fill pattern palette tool  
Flip  
Flip horizontal  
Flip tool  
Flip vertical  
Front/back tool  
Graphics  
Group  
Group tool  
Handles  
Internal graphic  
Line color palette tool  
Line pattern palette  
Line tool  
Line width  
Line width tool  
MacPaint  
Marquée  
Module  
Object  
Object-oriented graphics  
Paint  
Picture  
Paint tools  
Polygon tool  
Postscript  
Raster  
Rectangle tool  
Resolution  
Rotation tool  
Rounded rectangle tool  
Scrapbook  
Scrapbook file  
Selection tool  
Stationery  
Status area  
Template  
Text alignment tool  
Text element  
Text object  
Text tool  
Tool palette  
Tool palette display box  
Ungroup  
Vector graphics
Unit 10 demonstrates the practical value of the Macintosh's consistent user interface. Here, you will apply your knowledge of word processing and graphics fundamentals and operate two other applications: ClarisWorks 2.0 and Microsoft Works 3.0.

It is unlikely that you will have access to both programs. Since you cannot operate a program you do not have, the Guided Activities in Unit 10 have copious illustrations to help you understand the general process. For your convenience, the West Student Data folder provides the same Unit 10 practice files in ClarisWorks 2.0, Microsoft Works 3.0, and MS Word.

Unit 10 shows you how to use the word processor in these various applications to produce professional-level text. First, you will use your word processing application to locate and to change any inappropriate double spaces after punctuation marks into the typographically correct single space. Next, you will substitute the unprofessional "dumb quotes" with typographical quotes and apostrophes. Finally, you will type words and sentences in German, French, and Spanish—incorporating the option characters into word processing documents.

Learning Objectives

At the completion of this unit you should know
1. the learning advantage of the Macintosh's consistent user interface,
2. that each Macintosh word processor has the same basic capabilities,
3. that word processing packages differ from each other in features, not essential functions,
4. that Macintosh drawing modules are also relatively consistent in approach,
5. the definition, purpose, and use of an integrated software package,
6. the typographical distinctions between desktop publishing and manual typing.

At the completion of this unit you should be able to
1. use word processing applications and drawing modules in addition to MS Word,
2. distinguish between proportional and monospaced type,
3. avoid two spaces after punctuation, and use the Replace command to locate and correct inappropriate word spacing,
4. type typographic quotes, apostrophes, and dashes,
5. type orthographic characters used in foreign words.

Choosing Software

By now, you have become a reasonably proficient user of Microsoft Word 5.1. You know how to enter and manipulate text, to save your work, to preview it, and to print it. You can use the on-line spell checker, add headers and footers to multi-page documents, and even create custom graphics to enhance your work. Not bad for a beginner!

But you have learned in a controlled situation; Guided Activities predetermined both your application choice and the skills that you learned. Now, it is time to move beyond the safety net of the classroom and to make some work-related decisions.

Suppose you are learning to use the Macintosh to increase your employment opportunities. How important is it to learn the right software? Currently, there are more than ten word processing programs (including Works) from which to choose. How do you distinguish among these many applications to choose the right one? What if you learned MS Word 5.1 for one job, and your next job calls for skills in ClarisWorks? Will you have to start all over?

Perhaps you are a new Macintosh owner. How do you decide which software to purchase? Each application you buy represents a major dollar and time investment. Word processing packages list for between $100 and $500 apiece (November 1993 list prices), and each word processing package comes with at least as many pages of training and support documentation as its dollar value.

Once you decide on software, how long will that software remain appropriate? Major software companies like Microsoft typically offer new versions, or upgrades, of their software at least every eighteen months. With each program upgrade, you must either purchase the upgrade and learn its new features or be out of date!
Applying Your Knowledge

The reassuring answer to these worrisome questions is *relax.* From a cost perspective, as long as the final printed document is accurate and attractive the application or version number that produced it is insignificant. If your current version performs adequately, you are not obligated to upgrade it.

From a learning perspective, all word processing applications and their graphics modules work basically the same way. In each program, you enter, edit, and format text on the screen, save it to disk, and print at will. You use drawing tools to create, to edit, and to format objects that become a part of your overall document. Because of the Macintosh’s design, every time you acquire a new word processing/graphics application or version, your mastery of that software becomes easier.

**Consistent User Interface**

Apple developers spent nearly seven years creating and refining a consistent, uniform environment—one that doesn’t vary from one program to the next. This *consistent user interface* means that the most difficult application that you will learn is your first one. Once you master that first application, you have a head start in learning others. Virtually all Macintosh applications use the same mouse and keyboard actions to perform basic computing functions. Therefore, launching and quitting applications, saving and printing documents, or selecting and editing text are the same from one Macintosh application to the next. No matter what program you use, you can expect to find most or all of the File and Edit menu commands shown in Figure 10.1.

<table>
<thead>
<tr>
<th>File</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New</td>
<td>⌘N</td>
</tr>
<tr>
<td>Open...</td>
<td>⌘O</td>
</tr>
<tr>
<td>Close</td>
<td>⌘W</td>
</tr>
<tr>
<td>Save</td>
<td>⌘S</td>
</tr>
<tr>
<td>Save As...</td>
<td></td>
</tr>
<tr>
<td>Print Preview...</td>
<td></td>
</tr>
<tr>
<td>Page Setup...</td>
<td>⌘P</td>
</tr>
<tr>
<td>Print...</td>
<td>⌘P</td>
</tr>
<tr>
<td>Quit</td>
<td>⌘Q</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Edit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Undo</td>
<td>⌘Z</td>
</tr>
<tr>
<td>Cut</td>
<td>⌘H</td>
</tr>
<tr>
<td>Copy</td>
<td>⌘C</td>
</tr>
<tr>
<td>Paste</td>
<td>⌘V</td>
</tr>
<tr>
<td>Clear</td>
<td></td>
</tr>
<tr>
<td>Select All</td>
<td>⌘A</td>
</tr>
</tbody>
</table>

Whether you are using Microsoft Word, WordPerfect for Mac, MacWrite, WriteNow, Nisus, FullWrite Professional, Taste, MacQuill, a word processing module in an integrated (Works) package—or some new word processing application that hasn’t yet been invented—you follow the same steps to develop your word processing document.

1. Enter text.
2. Edit text.
3. Format text.
4. Save work.
5. Print work.

If your word processor includes a graphics module you will follow the same steps to create graphics objects.
1. Draw objects.
2. Edit objects (move and/or resize).
3. Format objects.
4. Save work.
5. Print work.

To use an unfamiliar application, you simply determine how it performs these basic operations. In most cases, it will perform them much like MS Word. Let’s begin by applying this strategy to two commonly used integrated applications, Microsoft Works and ClarisWorks.

GUIDED ACTIVITY 10.1
Comparing MS Word to Microsoft Works 3.0

The goal of Guided Activity 10.1 is to examine the Macintosh’s consistent user interface. Begin at the Desktop.

NOTE This is a read only activity if you do not have Microsoft Works 3.0.

1. Open the application.

   Each Macintosh application opens the same way: either select the icon and choose File/Open or double-click the application icon.

   Microsoft Works 3.0 is an integrated program, containing modules within the same application to perform textual (word processor), graphical (draw and spreadsheet charting), informational (database), numeric (spreadsheet), and telecommunications (comm) functions. Your first Works step is to choose the tool or primary type of work you wish to do from the icons at the top of the Works opening screen shown in Figure 10.2.

2. Open a new word processing document.
   a. Click the Word Processor tool icon. A box will form around the Word Processor tool icon to indicate that it has been chosen.
   b. Click the New button to display its word processor Menu bar and blank document window, Figure 10.3.
3. Locate the blinking insertion point. Just as in MS Word, the blinking insertion point is in the upper-left corner of the document window.

4. Locate the Microsoft Works 3.0 Ruler.

   Generally, the Microsoft Works 3.0 Ruler functions like the MS Word Ruler to set and indicate paragraph formatting. However, the buttons are in different places, and look slightly different. Also, the Microsoft Works 3.0 Ruler contains two buttons not found on the MS Word Ruler.

5. Figure out how to use the Microsoft Works 3.0 Ruler buttons. How do you find out how to use the buttons? You could read the manuals. You could also examine Microsoft Works 3.0’s on-line help.

   a. Press the Help menu title (see Figure 10.4).
Like MS Word, Microsoft Works 3.0 has two kinds of help: Balloon Help and Microsoft Works 3.0 Help. (It has an additional choice, Microsoft Works 3.0 Shortcuts.)

b. Turn on Balloon Help to read balloons about the Microsoft Works 3.0 Ruler buttons and then turn off Balloon Help.

Whoops! Microsoft never programmed any balloons for its Ruler. You won’t see any Ruler balloons.

c. Choose Help/Microsoft Works 3.0 Help to see the on-line Help window (see Figure 10.5).

d. Click the Word Processor to show more choices (see Figure 10.6).

Microsoft Works 3.0’s on-line help is an outline. Each time you click a phrase, you expand the topic to show more information/choices.

e. Click Beginning your work to see more choices (see Figure 10.7).

f. Click on How to...Use the ruler to display its help passage. Click the Microsoft Works Help zoom box to temporarily enlarge the window for easier reading (see Figure 10.8).

g. Read the passage on the Ruler in the Microsoft Works Help window.
h. Click each Ruler button in the Ruler illustration to obtain a brief description of its function. Apparently, this Ruler help is to take the place of Balloon Help.

i. Scroll down to read more, if desired.
The help passage on the Microsoft Works ruler contains an explanation of tabs, an important word processing feature not covered in this book. If you feel adventurous, you could read the help passage on tabs to expand your knowledge.

j. Close the Help window to return to the regular document.

What have you learned about the Microsoft Works 3.0 Ruler? Although it is visually different from MS Word’s, the Ruler sets and displays the same paragraph formats: alignment, indentation, line space, and tabs. Figure 10.9 identifies some specific Microsoft Works 3.0 Ruler landmarks.

6. Enter text. Type the following quote. (Your screen should resemble Figure 10.10.)

Everything should be made as simple as possible, but no simpler.
Albert Einstein

Just as in MS Word, you enter Microsoft Works 3.0 text from the keyboard. The status area in the bottom left corner of the MS Word window gives the page number.
7. Save the document as Einstein, MW.

**Note** Follow these steps exactly, or Microsoft Works 3.0 will save the document to your hard disk.

a. Choose File/Save As (File/Save As) to view the Save As dialog box.

b. Insert your Student Data Disk.

c. Name the document Einstein, MW. The Save As dialog box should resemble Figure 10.11.

d. Click Save.

8. Format the document. Like the other applications you have seen, Microsoft Works 3.0 formats on the character, paragraph, and document level.

a. Choose File/Page Setup and change the orientation from tall to wide.
The Microsoft Works 3.0 Page Setup dialog box, Figure 10.12, is almost identical to MS Word’s. (Your dialog box will look different if you use a different printer.)

b. Choose Help/Microsoft Works 3.0 Help to locate the margin settings.
   i. Click the Search button to display the Search dialog box (see Figure 10.13).

```
Type a word, or select from the list. Then choose Show Topics.

<table>
<thead>
<tr>
<th>margins</th>
<th>Show Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>margins</td>
<td></td>
</tr>
<tr>
<td>Match function</td>
<td></td>
</tr>
<tr>
<td>Match Records (Data menu)</td>
<td></td>
</tr>
<tr>
<td>mathematical functions</td>
<td></td>
</tr>
<tr>
<td>Max function</td>
<td></td>
</tr>
<tr>
<td>Merge Fields (Document menu)</td>
<td></td>
</tr>
<tr>
<td>merging</td>
<td></td>
</tr>
</tbody>
</table>

Select a topic, then choose Go To.

| Creating mailing labels and envelopes DB |
| Changing page margins, size, and orientation WP |
| Changing page margins, size, and orientation CM |
| Changing page margins, size, and orientation DR |
| Changing page margins, size, and orientation SS |
```

ii. Type margins. Click the Show Topics button. The lower search box will display a series of topics on margins.

iii. Click “Changing page margins, size, and orientation WP.”

iv. Click the Go To button to display the specific help item.

v. Scroll down through the passage until you find the specific section on page margins shown in Figure 10.14.

Microsoft Works 3.0’s on-line help explains that margins are set in the Document dialog box accessed from the File/Page Setup dialog box.

vi. Close Microsoft Works Help

c. Format the document.
   i. Change the orientation to wide.

   ii. Press the Document button in the Page Setup dialog box to display the Document dialog box (see Figure 10.15).
FIGURE 10.14

To change page margins, paper size, or orientation

1. From the File menu, choose Page Setup.

<table>
<thead>
<tr>
<th>To</th>
<th>Do this</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change paper size</td>
<td>Under Paper, choose the appropriate option.</td>
</tr>
<tr>
<td>Change page orientation</td>
<td>Under Orientation, choose the option you want.</td>
</tr>
<tr>
<td>Change page margins</td>
<td>Choose the Document button. Under Margins, type new measurements for the margins you want to change, and then choose the OK button.</td>
</tr>
</tbody>
</table>

The default is a one-inch margin on all four sides.

iii. Change the left and right margins to 2 inches and click OK.

d. Change the text of the entire document to 48-point Zapf Chancery. Microsoft Works 3.0 does not display a Ribbon. How will you format the characters? You could get help, or you could explore the pull-down menus (see Figure 10.16).

i. Press each Menu bar title in turn, to read the drop-down command lists. Figure 10.16 shows the menus. Fonts and sizes are chosen from the Font menu.

ii. Choose Edit/Select All (Alt A). The menu item and its keyboard equivalent are the same.

iii. Choose Font/Zapf Chancery. All the text is now in 12-point Zapf Chancery.

iv. Press the Style menu title. The Microsoft Works 3.0 Style menu does not list large type sizes.

v. Microsoft Works 3.0 has an auxiliary window called the tool palette (see Figure 10.17). If your tool palette is not visible, choose Window/Show Tools to display it.

The tool palette displays the font, the size, and the type style of the currently selected text, and provides triangular drop-down menus to change character format.
vi. Press the triangle to the right of 12 pt to see the drop-down size menu. Drag to 48 pt and release (see Figure 10.18).

9. Preview the document.

a. Choose File/Print Preview. The Print Preview window, Figure 10.19, looks familiar. One difference is that the command buttons are on the right rather than left side of the page display. Also, you navigate from page to page of a multiple-page document with the Previous and Next buttons, not a vertical scroll bar.

b. Click the Close box to close the Print Preview window.
10. Change paragraph justification. Right-align the last paragraph. Microsoft Works 3.0 lacks the ability to display nonprinting characters. Works also lacks keyboard equivalents for paragraph justification.
   a. Select the last paragraph, Albert Einstein.
   b. Click the ruler’s right align button. The last paragraph will right justify.

11. Type a blank line between the two paragraphs.

12. Save. Either Choose File/Save or type (Ctrl+S) to update your document.

13. Print.
   a. Choose File/Print (Ctrl+P) to reach the Print dialog box (see Figure 10.20).
      It looks almost the same as MS Word’s.
b. Click Print (or OK).

14. Choose File/Quit (⌘ Q) to quit Microsoft Works 3.0 and return to the Desktop.

GUIDED ACTIVITY 10.2
Comparing MS Word to ClarisWorks 2.0

The goal of Guided Activity 10.2 is to examine the Macintosh’s consistent user interface by using ClarisWorks 2.0 to create the same document already produced in Microsoft Works 3.0 (Guided Activity 10.1). Begin at the Desktop.

NOTE This is a read only activity if you do not have ClarisWorks 2.0.

1. Open the application.

ClarisWorks 2.0 loads and displays its dialog box, Figure 10.21, where you choose your primary tool from among the word processing, drawing, painting, spreadsheet, database, and communications tools. (ClarisWorks adds a painting module to the tools you already saw in Microsoft Works 3.0.)

2. Click OK to display the word processing tool’s Menu bar and document window (see Figure 10.22).
3. Locate the blinking insertion point. ClarisWorks displays page margins in its document window. Therefore, the insertion point is over and down about an inch, rather than flush against the top left side of the window.

4. Examine the Ruler. Generally, the ClarisWorks Ruler functions like the MS Word Ruler to set and to indicate paragraph formatting. However, the ClarisWorks 2.0 horizontal scale begins at the edge of the page, not the edge of the body. Its indent markers have different shapes, and there are different buttons.

5. Get Help for the ClarisWorks Ruler buttons.
   a. Press the Help menu title (see Figure 10.23). ClarisWorks 2.0 also has two kinds of help: Balloon Help and ClarisWorks Help.
   
   ![Figure 10.23](image)
   ClarisWorks 2.0 Help menu

   4:28 PM
   About Balloon Help...
   Show Balloons
   ClarisWorks Help...

   b. Turn on Balloon Help to read balloons about the ClarisWorks Ruler buttons and then turn off Balloon Help.
   c. Choose Help/ClarisWorks Help to see the on-line Help window (see Figure 10.24).

   ![Figure 10.24](image)
   The ClarisWorks Help window, entry screen

   Click a topic for more information.
NOTE Your Help screen may differ from Figure 10.24 because ClarisWorks Help remembers its current screen from one computing session to another. To locate the entry screen, click the box to the left of Contents in the left corner of the window. Repeat until you reach the entry screen.

d. Click Word Processing Documents to view its Help screen (see Figure 10.25).

![Figure 10.25](image)

**Figure 10.25**
The ClarisWorks Help window, Word Processing Documents screen

```
Using Help
ClarisWorks Basics
Word Processing Documents
Draw Documents
Paint Documents
Spreadsheet Documents
Database Documents
Communications Documents
Using Advanced Features
Functions Reference
Index
Customer Support Information
```

Selecting & Editing Text

Setting & Changing Margins
Setting & Changing Indents
Setting Text Ruler Units
Changing Space Between Lines
Changing Space Between Paragraphs
Changing Paragraph Alignment
Setting & Deleting Tabs
Copying Text Format
Inserting & Removing a Column Break
Changing Font, Size, Style & Color
Changing the No. & Width of Columns

**Setting Up an Outline**

Working in Outline View
Creating a New Topic
Rearranging Topics

![Figure 10.26](image)

**Figure 10.26**
The ClarisWorks Ruler, with Balloon explanation

- Indent marker
- Increase-Spacing control
- To increase the spacing between lines of text, select the text or a link anywhere in the paragraph, and click the increase-spacing control.
- Tabs
- Alignment
- Balloon

```
e. Explore the Help topics of your choice by clicking on them one at a time, and then reading the screen. To move back a screen to make another choice, click the rectangle left of Contents. What have you learned about the ClarisWorks Ruler? Although it is visually different from MS Word's, the Ruler sets and displays the same paragraph formats: alignment, indentation, line space, and tabs. Figure 10.26 identifies some specific ClarisWorks Ruler landmarks.
```

6. Enter text. Type the quote in Figure 10.27.

Just as in MS Word, you enter ClarisWorks text from the keyboard.
The status area at the bottom left corner of the ClarisWorks window in Figure 10.28 gives the cursor’s page number. It also provides control buttons not seen in any of the other applications discussed here.

7. Save the document as Einstein CW.

**NOTE** Follow these steps exactly, or ClarisWorks will save the document to your hard disk.

a. Choose File/Save As (⌘S) to view the Save As dialog box.

b. Insert your Data Disk.

c. Name the document Einstein CW. Your dialog box should resemble Figure 10.29.

d. Click Save.
8. Format the document. Both MS Word and ClarisWorks format on the character, paragraph, and document level.

a. Choose File/Page Setup and change the orientation from tall to wide. The ClarisWorks Page Setup dialog box, Figure 10.30, resembles MS Word's.

b. Choose Help/ClarisWorks Help to locate the margin settings (see Figure 10.31).

c. Close ClarisWorks Help.

d. Choose Format/Document to display the Document dialog box (see Figure 10.32).

The default is a one-inch margin on all four sides.

e. Change the left and right margins to 2 inches and click OK.

f. Change the text of the entire document to 48-point Zapf Chancery. ClarisWorks does not display a Ribbon. How will you format the characters? You could get help, or you could explore the pull-down menus.

i. Press each Menu bar title in turn, to read the drop-down command lists. Figure 10.33 shows the menus. Fonts and sizes are chosen from the Font menu.
ii. Choose Edit/Select All (A). The menu and keyboard equivalent are the same as for the other applications.

iii. Choose Font/Zapf Chancery. Note that ClarisWorks lists your font choices as they will print, to help you anticipate your results.

9. Preview the document.

ClarisWorks uses a different preview strategy than the other applications you have seen. The status area contains two buttons, one to enlarge the document, and one to reduce it (see Figure 10.28). The box to the left of these buttons displays the enlargement or reduction percentage. This strategy allows you to work on your document regardless of its display size.

Click the reduction button twice to reduce the document to 50 percent. If the whole document is not visible in your window, click the reduction button one more time. As Figure 10.34 demonstrates, the Ruler scale adjusts proportionately to reflect the document's actual size.

10. Change paragraph justification.

With the cursor in the last paragraph (Figure 10.34), Click the Ruler’s right alignment button. The last paragraph will right justify. Like Microsoft Works, ClarisWorks lacks justification keyboard equivalents.

11. Type a blank line between the two paragraphs.

12. Save. Either choose File/Save or type `S` to update your document.

13. Print.

   a. Choose File/Print (`P`) to reach a familiar-looking Print dialog box (see Figure 10.35).

   b. Click Print (or OK).

14. Choose File/Quit (`Q`) to quit ClarisWorks and return to the Desktop.
Features

Although MS Word, Microsoft Works 3.0, and ClarisWorks 2.0 perform many of the same operations, they are by no means identical. Differences between similar applications are known as features. Features are the bells and whistles that give individual application programs their personality; they are the specific functions of each program. The ability to handle columns of text or to create graphics are examples of application features.

Common Word Processing Features

Without going step by step though them, let us briefly examine some common word processing features.

TABS

Tabs or tabulation stops are positions set within a document’s margins to align text. When formatting text in columns, such as tables or charts, tabs are used to line up text easily and professionally. Figure 10.36 shows a table formatted with tabs in MS Word. Custom tab stops are set in the Ruler, with the columns of text aligned beneath them.
TABLES

Tables carry the tab concept a step further, providing a quick and easy way to arrange and to adjust columns of text and numbers. Tables allow you to group paragraphs side by side, or to arrange text beside related graphics. Once created, tables can be formatted attractively by shading certain parts of the table or adding borders. Figure 10.37 shows the MS word screen of a table created for Unit 5 of this text.

OUTLINERS

Outliners are powerful tools for organizing and reorganizing a document. An outliner allows you to create headings for key ideas, and then to move those headings around until your document structure is established. As you write, you fill in the outline, thereby keeping your writing on topic. Figure 10.38 shows the outline used to write Unit 10.
ClarisWorks has a unique twist on outlining; its outline can be formatted with a check box to the side of each item. As you complete each task, you click its box and a check mark appears (see Figure 10.39).

**FIGURE 10.39**
ClarisWorks outliner, check box formatted

![THINGS TO DO](image)

- Grade Papers
- Finish Unit Ten
  - Correct figure numbering
- Review end of Unit exercises
- Check answer key
- Feed Dogs
- Go to Post Office

**INDICES, FOOTNOTES, AND TABLES OF CONTENTS**

Some word processors are designed to automate the production of long articles and books. These programs have features that allow the user to identify key words or phrases that can later be compiled to generate an index or a table of contents. In writing this book, each unit began as a separate MS Word document. Figure 10.40 shows part of the table of contents MS Word generated for Unit 10.

**FIGURE 10.40**
MS Word generates a table of contents
MERGE

To print merge is to combine data from two or more documents into a single printout or series of printouts. Form letters and mailing labels are two common merge activities.

Electronic Typography

The mini-poster that you made or saw in Guided Activities 10.1–10.2 looks quite professional. Try those on a manual typewriter! Now, you are going to learn some tricks of electronic typography, the use of the computer to design aesthetically pleasing and readable text.

Typography is both a science and an art. For more than 500 years, professional typesetters have developed ways to make written words both legible and artistic. We can benefit from this tradition in our desktop publishing.

Carefully compare the top two lines of Figure 10.41. The top line is typographic, the desktop publisher’s rendition of lead and ink printing. The second line shows how a typewriter might have typed the same quotation.

**FIGURE 10.41** Typography versus typing

"It’s hard to predict—especially the future."

"It's hard to predict--especially the future."

...Niels Bohr, physicist

Character Spacing

The most obvious difference between the two sentences is line length; the first sentence is much shorter than the second. This occurs because printed text uses proportional spacing: its characters occupy different amounts of horizontal space depending on their shape. Therefore, the “i” in “predict” plus the space that separates it from “d” and “c” is narrower than the space occupied by its wider neighbors. The typewriter, in comparison, uses monospacing: no matter what its shape, each character occupies the same amount of horizontal space. The widest character, “W”, determines the amount of space that each character will occupy. Therefore, monospaced characters are farther from one another than proportional characters are from each other.

Nearly every Macintosh font is proportional; the common exceptions are Courier and Monaco. Proportional fonts are designed to have one typed space—not two—following periods, colons, question marks, and other punctuation. Only use two spaces if you are using a manual typewriter, or a monospaced font.
In precomputer times, typists were taught to put two spaces after punctuation, and the habit is hard to break. Fortunately, most word processing applications can help you to locate and eliminate any double spaces that you may have typed inadvertently.

**GUIDED ACTIVITY 10.3**

**Finding and Replacing Text**

Guided Activity 10.3 shows you how to use MS Word's Replace dialog box to find and replace text. (On-line help could show you how other applications locate and replace text.) Begin at the Desktop.

1. Open all H8. It is in the West Student Data folder on your Data Disk.
2. Print the document.
3. Examine the printed document. Observe the large white spaces after each punctuation mark. Compare this printout to a page in the textbook. Notice that published material does not have these large spaces.
4. Save the document as new Henry VIII.
5. Use the Replace dialog box.
   a. Choose Edit/Replace. The Replace dialog box, Figure 10.42, appears.

   ![The Replace dialog box](image)

   The Replace dialog box helps you find whatever text you type into the Find What: rectangle and replaces it with the contents of the Replace With: rectangle. You can either Replace All found instances at once—which can be dangerous and not Undo-able, or you can Find and Replace text instance by instance. This lets you override individual changes if so desired.
   b. Type Henry in the Find What: rectangle.
   c. Type Henry the Eighth in the Replace With: rectangle.
   d. Click Find Next. The first instance of Henry will be highlighted in your document. If the Replace dialog box covers the selection, drag the dialog box, Figure 10.43, by its title bar to a better location on your screen.
e. Click Replace to change the text, and look for the next instance. Your document reads Henry the Eighth VIII. (You will remove the redundant VIII from the document later.) Replace highlights the next Henry it finds.

During Henry's reign,

f. Click Replace to change to Henry the Eighth's reign and look for the next Henry.

Henry, however,

g. Click Find Next to leave this Henry unchanged and search for the next one.

h. Continue through the document, changing some Henrys to Henry the Eighth, and leaving the others alone for variety.

i. Click OK when a dialog box informs you that you have reached the end of the document.

j. Close the Replace dialog box.

6. Locate and remove VIII.

a. Scroll to the beginning of the document, and set the insertion point before the first character.

b. Choose Edit/Replace or [F8]. The dialog box reopens with your previous find and replace criteria still set.

c. Select Henry in the Find What: rectangle and replace it with VIII.

d. Select and delete all the text in the Replace With: rectangle. The Replace With: rectangle only contains a blinking insertion point. Replace With: will now find nothing and delete text that you do not want.

e. Click Find Next.

f. Click OK to the end of document reached message, and close the Replace window.
7. Locate and change the double spaces to single spaces.
   a. Scroll to the beginning of the document, and set the insertion point to the left of the first character.
   b. Change the criteria in the Replace dialog box.
      i. Select \texttt{VI I I} and replace it with two spaces. You won't be able to see the spaces, but the insertion point will move to the right two spaces to show that they are present.
      ii. Type one space in the Replace With: rectangle.
   c. Click Find Next. The first set of double spaces will highlight.
      \texttt{Eighth\was}
   d. Click Replace.
   e. Click Replace All to remove all the extra spaces in the document in one step.
   f. Click Yes if you are asked to continue checking the beginning of the document.

\textbf{NOTE} Only use Replace All if you are sure you want to remove every extra space. Otherwise, go instance by instance with Replace, and Find Next for spaces you wish to keep. Click Yes for the \textquote{Continue changing from beginning of document?} alert and then click OK for end of document reached.

g. Close the Replace dialog box.

8. Save and print.

9. Compare this printout with the original. Observe how the tighter spacing makes the document look more like printing and less like typing.

\textbf{Typographic Punctuation}

Examine Figure 10.41's punctuation. When the typewriter was standardized, its limited keyboard had room for only the most frequently used punctuation characters. Nonessential characters were eliminated, and some of those that remained served double duty. As Table 10.1 shows, the inch mark replaced the opening and closing double quotes; the foot mark replaced opening and closing single quotes and the apostrophe; the double hyphen replaced the dash; and three periods replaced the ellipsis.

Typographically correct opening and closing quotes are sometimes called either \textit{curly quotes}, because of their rounded shapes, or \textit{smart quotes}, because \textquote{smart} people use them. The Macintosh's option characters (Key Caps) let you use typographically correct punctuation in your desktop published documents.

\textbf{NOTE} \textit{Smart Quotes is a utility program that is smart enough to recognize the quote keystrokes and convert them to the correct curly version. This may be the actual derivation of the term.}
TABLE 10.1  
Typographic and typed punctuation

<table>
<thead>
<tr>
<th>PUNCTUATION</th>
<th>TYPOGRAPHIC</th>
<th>TYPED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch mark</td>
<td>5&quot;</td>
<td>5&quot;</td>
</tr>
<tr>
<td>five inches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot mark</td>
<td>5'</td>
<td>5'</td>
</tr>
<tr>
<td>five feet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apostrophe contraction:</td>
<td>it's</td>
<td>it's</td>
</tr>
<tr>
<td>it is</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opening quote</td>
<td>'It</td>
<td>'It</td>
</tr>
<tr>
<td>single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>double</td>
<td>&quot;It</td>
<td>&quot;It</td>
</tr>
<tr>
<td>Closing quote</td>
<td>future.'</td>
<td>future.'</td>
</tr>
<tr>
<td>single</td>
<td></td>
<td></td>
</tr>
<tr>
<td>double</td>
<td>future.&quot;</td>
<td>future.&quot;</td>
</tr>
<tr>
<td>Ellipsis</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Dash</td>
<td>predict—especially</td>
<td>predict--especially</td>
</tr>
</tbody>
</table>

GUIDED ACTIVITY 10.4  
Using Typographic Punctuation

Guided Activity 10.4 shows you how to enter the quotation from Figure 10.41 using typographically correct punctuation. Use the word processor of your choice; typographic punctuation is controlled by the Macintosh itself, not by a specific application.

**NOTE** MS Word and ClarisWorks have smart quotes built in; you can turn them on or off. With Smart Quotes turned on, typographic quotes and apostrophes appear when typed, without the option combinations.

1. Open a new word processing document.
2. Type \( \text{Option}[\text{L}] \) (left square bracket, above the inch and foot key in Figure 10.44) to enter an opening double quote.

**FIGURE 10.44**  
Square brackets' location
3. Type it then [Option][Shift] (right square bracket) for the smart apostrophe, then the final s, and a space.

4. Type hard to predict and then [Option][Shift] for the dash. Technically it is called an em-dash because it is approximately the length of an m.

5. Type especially the future, and then [Option][Shift] (left square bracket) for the closing double quote.

6. Type [Return] twice and then [Option] for the ellipsis.

7. Type Niels Bohr, physicist.

8. Choose File/Save As or press.[S].

9. Insert your Data Disk and Save As Bohr.

10. Format the document attractively. Be sure to use a proportional font.

11. Save, preview, print, and quit.

The Multilingual Macintosh

Not only does the Macintosh keyboard allow you to use proper punctuation, but it also lets you type special characters for languages other than English. The Symbol font contains the entire Greek alphabet. Other fonts allow your Mac to type the Russian, the Hebrew, the Japanese, the Arabic, and other languages' alphabets. Even the standard "English" fonts let you produce the accent marks and other diacritics that are used to write French, German, and Spanish.

GUIDED ACTIVITY 10.5

Using NonEnglish Characters

Guided Activity 10.5 shows you how to type accents, diacritics, and punctuation marks in French, German, and Spanish. Begin at the Desktop.

1. Open Vocabulary in the application of your choice in the West Student Data folder on your Data Disk (vocab.cw in ClarisWorks and vocab.w3 in Microsoft Works 3.0).

   Within the document, each punctuation mark, accent, or diacritic that you need to change is outlined to make it easier to locate. The English translation is to the right of each word or phrase you will alter.

   Mexico

2. Change the e in Mexico to é.
   a. Select the e.
   b. Type [Option]E. Nothing appears to happen.
c. Type [E]. Now the é appears! (Option)E places an acute accent above the next character (vowel) that you type. OptionE plus A makes á, OptionE plus I makes i, and so on.

3. Adapt step 2 to place acute accents in júnto, cábalo, and dónde.

4. Change the n in Espagna to ñ.
   a. Select the n.
   b. Press Option N.
   c. Type n. OptionN places a tilde above the next typed character.

5. Adapt step 4 to place a tilde above the second n in niño.

6. Correct the beginning punctuation in ¿dónde? and ¡Espere!
   a. Select the first ?.
   b. Type Option Shift/ (slash) to replace it with the Spanish upside down question mark.
   c. Select the first !.
   d. Type Option I to replace it with the Spanish upside down exclamation point.

7. Place a cedilla under the c in français.
   a. Select the c.
   b. Type Option C.

8. Adapt step 7 to place a cedilla under the second c in comme ça.

9. Place a grave accent on the first e in mère.
   a. Select the e.
   b. Type Option E (just to the left of the 1 on the keyboard).
   c. Type e. Option E places a grave accent above the next typed character.

10. Adapt step 9 to place a grave accent on the a in là.

11. Place a circumflex over the u in sôr.
   a. Select the u.
   b. Press Option 1.
   c. Type u. Option 1 places a circumflex above the next typed character.

12. Adapt step 11 to place circumflexes over the e in arrêtez and the second e in peut-être.

13. Place an umlaut over the a in später.
   a. Select the a.
b. Press Option U.

c. Type a. Option U places an umlaut above the next typed character.

14. Adapt step 13 to place an umlaut over the o in Könnten.

15. Replace ss with ſ in Muß.

   a. Select ss.
   
   b. Press Option ſ.

16. Change three periods to an ellipsis in the last two sentences.

   a. Select the three periods after ich.
   
   b. Press Option [ ] (semicolon).
   
   c. Adapt steps a. and b. to change the last sentence, Könnten sie...

17. Save.

18. Select the whole document and choose Format/Plain Text in MS Word or Style/Plain Text in WordPerfect Mac to remove all the outline characters.

19. Format and print the completed document as you like. Figure 10.45 gives an example.

---

**FIGURE 10.45**

**Completed Guided Activity 10.5**

**SPANISH VOCABULARY**

<table>
<thead>
<tr>
<th>Spanish</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>México</td>
<td>Mexico</td>
</tr>
<tr>
<td>España</td>
<td>Spain</td>
</tr>
<tr>
<td>junto</td>
<td>together</td>
</tr>
<tr>
<td>caballo</td>
<td>horse</td>
</tr>
<tr>
<td>niño</td>
<td>child</td>
</tr>
<tr>
<td>¿dónde?</td>
<td>where?</td>
</tr>
<tr>
<td>¡Espera!</td>
<td>Wait!</td>
</tr>
</tbody>
</table>

**FRENCH VOCABULARY**

<table>
<thead>
<tr>
<th>French</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>français</td>
<td>French</td>
</tr>
<tr>
<td>mère</td>
<td>mother</td>
</tr>
<tr>
<td>préfère</td>
<td>prefer</td>
</tr>
<tr>
<td>bien sûr</td>
<td>of course</td>
</tr>
<tr>
<td>arrêtez</td>
<td>stop</td>
</tr>
<tr>
<td>Qui est là?</td>
<td>Who's there?</td>
</tr>
<tr>
<td>peut-être</td>
<td>perhaps</td>
</tr>
<tr>
<td>comme ça</td>
<td>like that</td>
</tr>
</tbody>
</table>

**GERMAN VOCABULARY**

<table>
<thead>
<tr>
<th>German</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bis später.</td>
<td>See you later.</td>
</tr>
<tr>
<td>Muß ich...</td>
<td>Do I have to...</td>
</tr>
<tr>
<td>Können sie...</td>
<td>Can you...</td>
</tr>
</tbody>
</table>
NOTE  This Guided Activity has been very tedious. If you regularly use your Macintosh for languages other than English, you can obtain special keyboard layout software to simplify your data entry. In addition, many word processing applications have dictionaries for many languages other than English.

Summary

Unit 10 delineates the basic word processing steps—enter, edit, format, save, and print. The presentation of two unfamiliar word processing applications—Microsoft Works 3.0 and ClarisWorks 2.0—demonstrated how the Mac’s consistent user interface and your understanding of word processing principles can be generalized easily to new situations. Some of WordPerfect Mac’s special features and other features common to many word processors were also illustrated.

The second part of Unit 10 taught you about electronic typography. First, you learned to distinguish between proportional and monospaced fonts, and to avoid double spacing after punctuation in proportional fonts. Then, you used MS Word’s Find and Replace feature to locate and change characters. Finally, you used the Option modifier key in combination with other keys to produce typographic punctuation and to type accents, diacritics, and punctuation marks in French, German, and Spanish.

Command Review

Edit/Replace  Displays Replace dialog box where you can locate specific text and replace it with other text.

Exercises

The following exercises and questions reinforce your understanding of the Macintosh’s consistent user interface, and give you more experience using professional typography.

1. Quotations

The Exercise folder in your West Student Data folder contains a folder called Unit 10. It contains several versions of the same file, quotations, using different word processing applications. Quotations is a collection of famous quotes by French, German, and Spanish writers. The text is large for easy editing, and the characters to change are in outline style for easy recognition. You will correct, format, save, and print the file.

a. Open the quotations file of your choice.
b. Replace all the “dumb” quote marks and apostrophes with typographically correct quote marks and apostrophes. (*Hint:* use Replace to find and replace all the apostrophes at once.)

c. Edit the text to place the correct accents and diacritics into the quotes and the authors’ names.

“La génie n’est qu’une grande aptitude à la patience.”
*George-Louis LeClerc de Buffon*

“El hacer bien, aun en sueños.”  *Pedro Calderón de la Barca*

“L’écrivain original n’est pas celui qui n’imite personne, mais celui que personne ne peut imiter.”  *François-René de Chateaubriand*

“Jeder nach seinen Fähigkeiten, jedem nach seinen Bedürfnissen.”  *Karl Marx*

“Le bon sens est la chose du monde la mieux partagée, car chacun pense en être bien porvu.”  *René Descartes*

“Plus ça change, plus c’est la même chose.”  *Alphonse Karr*

“Le nez de Cléopatra: s’il eût été plus court, toute la face de la terre aurait changé.”  *Blaise Pascal*

“Le superflu, chose très nécessaire.”  *Voltaire*

“Grau, teurer Freund, ist alle Theorie, und grün des Lebens goldner Baum.”  *Johann Wolfgang von Goethe*

d. Format the entire document 12 points, plain, Palatino.

e. Italicize and *right justify* each author’s name.

f. Print your document.

g. Format as you choose, and print a final document.

2. Make a mini-poster out of one of the quotes from exercise 1.

a. Copy the quotation of your choice, and its English translation and author’s name.

b. Choose File/New to open a new document.

c. Paste the quotation into the new file.

d. Format the text attractively.

e. Decorate the mini-poster with internal graphics. If you use an application other than MS Word, use on-line help to learn how to use the graphics module(s).
3. Create a quick reference sheet to list the keystroke combinations for commonly used special characters. Follow each typed character with a tab and then the key combinations needed to create the character.
   a. щ (Option S)
   b. é (Option E + E)
   c. ň
   d. ö
   e. ç
   f. ß
   g. ç
   h. è
   i. û
   j. "
   k. ”
   l. ’
   m. ’
   n. —

4. Generalize your computer knowledge to a new situation. Locate a Macintosh word processing application with which you are not familiar. Open and use the application to type, to correct, to format, to save, and to print a brief document.

Review Questions

Multiple Choice

1. When purchasing an application, your best approach is to
   a. purchase as many applications as you can afford
   b. buy the most expensive application
   c. find one that meets your needs and standards
   d. check with your local employment agency for the five most frequently used business applications and learn each one before making a purchase
2. Apple developers spent nearly seven years creating and refining a uniform computing environment known as the
   a. consistent user interface
   b. common features approach
   c. easy command access
   d. pull-down menus

3. People who use applications infrequently tend to forget where commands are located. Infrequent users of the Macintosh need not worry because
   a. generally, many on-screen commands are available
   b. a quick search through the pull-down menus offers command name recognition even though the specific command name cannot be cited from memory
   c. applications share similar computing functions
   d. all of these

4. Type only one space rather than two after each punctuation mark if your computer is using a(n) ____________ font.
   a. electronic
   b. monospaced
   c. proportional-spaced
   d. typewriter

5. Which character does Option+E + E produce?
   a. é
   b. ê
   c. œ
   d. ë

**True or False**

1. ____ The Desk Accessory that can help you to locate special characters is the Caps Lock.

2. ____ Manual typewriters use proportional spacing.

3. ____ Adding diacritics, accent and real punctuation marks to characters reflects a more in-depth knowledge of word processing capabilities.
4. In precomputer times, typists were taught to put one space after punctuation.

5. Always use Replace All. It’s faster!

**Fill In the Blanks**

1. List the basic word processing steps:
   a. 
   b. 
   c. 
   d. 
   e. 

**Key Terms**

Apostrophe  Em-dash  Opening quote
ClarisWorks  Features  Outliners
Closing quote  Foot mark  Print merge
Consistent user interface  Inch mark  Proportional spacing
Curly quotes  Integrated program  Smart quotes
Dash  Macro  Table
Electronic typography  Microsoft Works  Tool
Ellipsis  Monospacing  Upgrades
PART TWO  Software programs have practical precursors. The word processor improves the typewriter; the spreadsheet improves the paper ledgers used by bookkeepers and accountants; and the database improves the shoe box, card file, or filing cabinet. In Part Three, you will create, edit, and format numeric and informational documents. You will also receive a detailed analysis of how the Macintosh handles both storage and memory.

Unit 11, "Spreadsheet Basics," explains what a spreadsheet is, how it operates, and how to use it.

Unit 12, "Spreadsheet Problem Solving," shows you how to create custom Excel worksheets for financial analysis and future planning.

Unit 13, "The Database," demonstrates how to arrange an Excel worksheet to retrieve, manipulate, and print specific information. The unit also examines some of the capabilities of FileMaker Pro, a widely used database.

Unit 14, "Macintosh Management," focuses on strategies for effective organization and utilization of both storage and memory.
Unit 11 introduces you to the application that processes numbers—the spreadsheet. After taking a HyperCard introduction to Excel, you will work with spreadsheet documents, called worksheets, on your Data Disk. By the end of Unit 11 you will be able to navigate a worksheet, to edit data, to format the worksheet to enhance its appearance, and to create a chart to display its informational results.

Learning Objectives

At the completion of this unit you should know

1. what a spreadsheet is,
2. common ways people use spreadsheets,
3. how a spreadsheet is organized into columns, rows, and cells,
4. that cells contain either labels or values,
5. that values can be either constant (numbers) or variable (formulas and functions),
6. how to enter data into cells,
7. the relationship between a worksheet and a chart.

At the completion of this unit you should be able to

1. identify the basic spreadsheet components: rows, columns, and cells,
2. navigate the spreadsheet window,
3. open, edit, format, save, preview, and print an Excel worksheet:
   a. use the formula bar to enter and to edit spreadsheet cells,
   b. format cell entries: number, alignment, and text,
   c. adjust spreadsheet column width and row height,
   d. create formulas to derive cell values,
   e. use AutoFill and Copy/Paste to facilitate data entry,

4. create and manipulate a chart of your spreadsheet information.

---

**Getting Started**

Each spreadsheet application opens to display a blank worksheet such as the one shown in Figure 11.1: the primary document for recording, calculating, and analyzing data. The worksheet is a computerized matrix of little boxes called cells that are arranged in lettered columns and numbered rows. To use the worksheet, you enter data into the cells and direct the spreadsheet program to perform mathematical operations on your data.

---

**The Cell**

Cells are containers. Two types of data can go into cells: labels and values. **Labels** are data that will not be used for calculation, and can include a combination of letters, numbers, and other characters. They are descriptions, used for headings and explanations, that make a worksheet more readable. Examples of labels include: headings, such as FY1991 or total sales; descriptions, such as Western Regional Sales Projections; or textual information, such as names, addresses, or phone numbers.

**Values** are numeric data; they can be manipulated mathematically. Values can be further divided into two groups, constants and formulas. **Constants** are numeric data that do not change when data in other cells are altered. Constants include what we commonly think of as numbers: whole numbers (64 or −752), decimals...
(857.964 or $56.90), and fractions (2 $\frac{3}{4}$). Dates (June 2, 1876) and times (4:30 pm) can also be spreadsheet constants, since they can be manipulated mathematically to answer questions, such as: "how many years ago was 1876?," or "what time will it be in two hours?" *Formulas* are mathematical statements that derive their values, through arithmetic operators, from the values found in other cells. These other cell values provide the formula’s variables.

Formulas are the heart of any spreadsheet application: formulas perform the calculations. A formula can derive the sum of two other cells, determine the smallest value in 65 cells, or perform virtually any conceivable numeric calculation.

**The Worksheet Matrix: Columns and Rows**

Each Excel worksheet contains 256 columns and 16,384 rows. *Column headings*, at the top of each worksheet column, range from column A through column Z, column AA through AZ, up to column IV (*not* Roman numeral IV). *Row headings*, at the left of each row, range from row 1 to row 16,384.

**Cell Reference**

The worksheet matrix provides order to the more than four-million potential cells (256 x 16,384) that are available in each worksheet. Each cell has a unique *cell reference*, the combination of its column and row headings. Therefore, column C and row 4 intersect to form cell C4 in Figure 11.2. Moving from beginning to end, the worksheet’s first cell, in its top left corner, is A1; the last cell, in the bottom right corner, is IV16,384.

Although four-million-plus cells may be available, you will only use a small portion of those cells as you build a worksheet. Ultimately, computer hardware (memory and storage) limits the number of cells a spreadsheet application can manipulate and save. The spreadsheet application only stores the data in the group of cells that are being used.
How Spreadsheets Are Used

If you are not an accountant or a bookkeeper, why would you ever want to use a spreadsheet? The answer is that spreadsheets facilitate a wide variety of calculation and analysis. Virtually any data that can be arranged in a table can be placed into a worksheet. Common business uses of spreadsheets include:

- recording and tallying income and expenses
- budget preparation
- inventory control
- accounts receivable
- cash flow analysis
- preparation of competitive bids
- production of sales and salary summaries
- long-range profit and loss predictions

Scientists use spreadsheets to keep track of and analyze data. Educators use spreadsheets to keep track of grades. Other people use spreadsheets to:

- prepare a household budget
- keep track of income and expenses
- analyze cash flow
- balance a checkbook
- create and maintain an insurance inventory of personal belongings
- track investment value and performance (stocks, bonds, real estate, and others)
- make informed decisions about major purchases (homes, automobiles, computers, and so forth)

Spreadsheets may change the way that you feel about math. If you tend to avoid numbers, you'll love the spreadsheet—it calculates and displays results immediately. If you need to change some numbers or rearrange them, the spreadsheet will recalculate the total(s) automatically. So, instead of erasing pencil marks and rerunning long lists of numbers on a calculator, use a spreadsheet.

If you manipulate numbers on a daily basis, you will be enthralled with Excel's sophistication. Excel has 130 predesigned formulas called functions that simplify a wide range of mathematical, statistical, logical, scientific, and engineering calculations.
Based on your MS Word experience, the Excel screen (see Figure 11.3) will look familiar. In addition to the Macintosh's consistent user interface, all Microsoft software has a consistent interface that makes it easier to learn new applications.

At the top of the screen is the menu bar of Excel's pull-down menus with the Excel icon in the right corner.

Just below the menu bar is the Toolbar (Figure 11.4) with its row of button tools to help you perform selected actions quickly and easily.

Below the Toolbar is the formula bar (Figure 11.5), where you enter and edit data in worksheet cells (or in charts). The cell reference of the active cell, the one that will receive the entered or edited data, appears in the reference area in the left corner of the formula bar.

At the bottom of the Excel screen is the status bar. It displays information about the current mode or activity. The left side status bar says "Ready" when
no command is selected, as in Figures 11.3 and 11.6. When you select a command, the text changes briefly to describe that command. The left side of the status bar can also give directions for operations in progress, such as copying or moving cells. The right side of the status bar shows whether special keys, such as Caps Lock or Num Lock, are turned on; the Num Lock is on in Figure 11.6.

![Figure 11.6](image)

Excel waits for your next action

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### Getting Started in Excel

Included with the Excel program are two on-screen interactive tutorials: "Introducing Microsoft Excel" and "Learning Microsoft Excel." These tutorials were created in an authoring program called **HyperCard**, to give you a quick start in Excel.

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### GUIDED ACTIVITY 11.1

**Introducing Microsoft Excel**

In Guided Activity 11.1, you will open Introducing Microsoft Excel and follow its on-screen instructions to learn how to use the formula bar, select cells and ranges of cells, and to use other Excel commands and shortcuts. In Guided Activity 11.2, you will make the modifications you just learned on an actual worksheet.

1. Set your monitor to black and white. Introducing Microsoft Excel requires a black and white monitor to display properly. If your monitor displays colors or shades of gray, you must set it to black and white before proceeding.
   a. Choose 🖱/Control Panels/Monitors to display the monitor control panel (Figure 11.7).

   ![Figure 11.7](image)

   **Characteristics of selected monitor:**
   - Grays: 7.0
   - Colors: 16
   - Options...

   b. Click Black and White to select it.
   c. Click the close box to close the Monitor control panel.

2. Open Introducing Microsoft Excel.
   a. Locate the Introducing Microsoft Excel icon on your hard drive.
   b. Double-click the icon to open it.
3. Locate the HyperCard pointer on your screen. You will use this pointer to navigate through the tutorial.

4. Click the button just to the left of THE BASICS (Figure 11.8) to start the lesson.

5. Read the screen and follow the instructions. Click on the appropriate HyperCard control button to move to the next screen, or to return to a previous screen to review a lesson, as indicated in Figure 11.9.

6. By the end of the lesson, you should feel comfortable with the Microsoft Excel Basics in Figure 11.10.
7. Click the Menu button, then the Quit button, and finally OK in the Quit the Introduction to Microsoft Excel box to return to the Desktop.

8. Return your monitor to its original color setting, if you changed it in step 1.
   a. Choose Control Panels/Monitors to display the monitor control panel.
   b. Select the original setting.
   c. Close the Monitor control panel.

**GUIDED ACTIVITY 11.2**

*Modifying a Worksheet*

Guided Activity 11.2 uses the same data as the Introducing Microsoft Excel lesson. You will open the Introducing Excel file on your data disk, modify it, save it, and print it. Begin at the Desktop.

1. Open the Introducing Excel worksheet on your data disk. The worksheet will open to display a document window similar to Figure 11.11.

   ![](image)

   **FIGURE 11.11**
   
   The Introducing Excel worksheet

   - **A**
   - **B**
   - **C**
   - **D**
   - **E**
   - **F**

<table>
<thead>
<tr>
<th></th>
<th>introducing Excel</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1</td>
<td>BLUE YONDER AIRCRAFT</td>
</tr>
<tr>
<td>2</td>
<td>Western Regional Sales Projections</td>
</tr>
<tr>
<td>3</td>
<td><strong>Northwest</strong></td>
</tr>
<tr>
<td>4</td>
<td><strong>Idaho</strong></td>
</tr>
<tr>
<td>5</td>
<td><strong>Montana</strong></td>
</tr>
<tr>
<td>6</td>
<td><strong>Oregon</strong></td>
</tr>
<tr>
<td>7</td>
<td><strong>Washington</strong></td>
</tr>
<tr>
<td>8</td>
<td><strong>Utah</strong></td>
</tr>
</tbody>
</table>

   ![](image)

   **FIGURE 11.12**
   
   The active cell

   - **B**
   - **C**
   - **D**
   - **E**

   2. Check the formula bar to see which cell is active (A3 in Figure 11.11). whichever cell is active when a worksheet is last saved will be active when the file is retrieved and opened.

   3. Locate the active cell in the document window. Observe that the active cell has a thick **border** around it, and a square **fill handle** in its lower-right corner, as shown in Figure 11.12.
NOTE If you are using a color monitor that displays a light highlight color, such as yellow, the active cell may not be very distinct, and its fill handle may be nearly invisible. Ask for assistance to darken your highlight color.

4. Roll the pointer onto the document window. When the pointer is shaped like a **hollow cross**, it can be used for cell selection.

5. Enter data into cell A11.
   a. Click cell A11 in the document window to select it (make it the active cell). Cell A11 will have a border around it, and its reference will appear in the formula bar.
   b. Type West. As you type, the text appears both in the formula bar (Figure 11.13) and in the cell itself. Enter and cancel buttons and an insertion point also appear in the formula bar.
   c. Click the enter button to complete the entry and place data (West) into the active cell (A11). Once a cell's data is entered, the formula bar's enter and cancel buttons and its insertion point disappear, but the active cell does not change (as in Figure 11.14).


   A **range** is a rectangular group of cells on the worksheet. You select a range when you want to command a group of cells all at once; you might format them, move them, or perform a calculation using them. A **range reference** consists of the beginning cell reference, a colon, and the ending cell reference. The range reference of cells A4 through E9 is A4:E9.
UNIT 11 SPREADSHEET BASICS

5. Move the pointer over the first cell in the range, A4, and drag diagonally to the last cell in the range, E9. Keep your finger on the mouse button and look at the formula bar. The reference area shows the size of the range you have selected, 6R X 5C, or a rectangle six rows wide and five cells deep (see Figure 11.15).

6. Release the mouse button. The selected cell range is highlighted, with the thick border around the entire range, and the fill handle at the bottom right corner of the range. The first cell in the range, A4, does not highlight. It is the active cell, with its reference displayed in the formula bar.

7. Click cell B4 to deselect the range and activate B4. To deselect a range, click on any single cell in the worksheet. The selected range will deselect, and the cell you clicked on will become the active cell.

8. Copy cell contents from one range to another.

a. Select B4:E4, as in Figure 11.16.

b. Choose Edit/Copy (Ctrl+C). A marching line will appear around the range, as in Figure 11.17.

c. Read the status bar at the bottom of the screen, as in Figure 11.18.

d. Click B11, the first cell in the designated range.

e. Press Enter to paste the range into its destination. The range B4:E4 is still enclosed by the marching line.
9. Move a range of cells from one location to another.
   a. Select B9:E9. As soon as you select a different range, B4:E4 stop marching.
   b. Position the tip of the pointer on the bottom edge of the range. When the pointer is in the correct position, its shape will change from an open cross to an arrow as shown in Figure 11.19.
   c. Drag the range until it is directly over B15:E15. Only its outline will move.
   d. Release the mouse button to move the range itself into the new location.

10. Type Total into B9 and press Enter.

11. Use the Toolbar’s AutoSum button to calculate the Northwest sales totals for 1991.
   a. Select C9, where the first total will appear.
   b. Click the AutoSum button.
   c. Observe the sum formula that appears in the formula bar, =SUM(C5:C8). Verify that the cell range to sum, C5:C8, is correct.
   d. Press Enter to perform the calculation and display the results in cell C9.

12. Use Excel’s AutoFill to copy C9’s SUM formula into D9:E9. AutoFill lets you copy a cell’s contents into adjacent cells. In this case, AutoFill will copy the formula in the active cell, C9, into cells D9 and E9.
   a. With C9 active, roll the pointer to the fill handle at the cell’s bottom right corner. When the pointer is in the right position, its shape will change from the hollow cross pointer to a cross pointer.
   c. Click D9 and look at its formula (in the formula bar), =SUM(D5:D8). When you copy a formula from one cell to another, Excel automatically adjusts the formula range(s) to reflect the new position. This default adjustment is called relative referencing because the formula adjusts relative to its location in the worksheet.

14. Save. Another way to save, other than to choose File/Save type [S], is to click the Toolbar’s Save button (this will also work in the MS Word Toolbar).

15. Preview and print your worksheet:
   a. Choose File/Print Preview to display the Print Preview window, Figure 11.20.

   Just as in Word, the Excel Print Preview window displays the header, footer, and page margins that will appear in the printed document. The buttons at the top of the screen let you modify the document’s layout before it is printed.

   **NOTE** If you have a full-page monitor, you will be able to view each worksheet page at full size without scrolling. In that case, the Zoom button will be dimmed and you should go directly to step c.

   b. Click Zoom to see the document at actual size. Scroll to read the header and footer. By default, Excel places the file name, in this case, Introducing Excel, in the center of the header and the page number in the center of the footer.

   c. You will make your document look more attractive in the next Guided Activity. For now, just press Print to print it.

16. Quit Excel to return to the Desktop.
Formatting the Worksheet

Like word processing documents, worksheets can be formatted attractively both on screen and on paper. Excel's formatting capabilities are abundant. You can control character shape and size, numeric displays, cell width and height, alignment of data within cells, the presence or absence of the grid on either screen or paper, and the position of the worksheet on the printed page.

Characters

Characters are formatted similarly to those on a word processor. First, select the area to format: a text block within the formula bar, a cell, or a range of cells. Second, apply the format you want to the selected text. The Toolbar's character format buttons (see Figure 11.4) allow you to bold, italicize, enlarge, or decrease the size of selected text quickly. For more choices, choose Format/Font to select the font, size, style, and even the color you want from the Font dialog box (Figure 11.21).

Numbers

Most Excel data are numeric: currency, percentages, fractions, dates, and times. Number format determines how these numbers will be displayed in selected cells. Each cell entry appears in two places: in the formula bar when the cell is active, and in the cell itself. Figure 11.22 shows the distinction.
These numbers do not necessarily have the same format or display. The cell itself displays, in most cases, the number as you typed it. The formula bar, on the other hand, displays the number in the format Excel requires to perform calculations. Excel does an excellent job of preserving your number formats (compared to previous versions of the software), but has trouble with certain formats. As Table 11.1 demonstrates, occasionally Excel will interpret a format in an unexpected way.

**TABLE 11.1**
Number formats and the formula bar

<table>
<thead>
<tr>
<th>NUMBER TYPE</th>
<th>ENTRY INSTRUCTIONS</th>
<th>WHAT IS TYPED, CELL DISPLAY AFTER ENTRY</th>
<th>FORMULA BAR DISPLAY AFTER ENTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive number</td>
<td>Just type</td>
<td>8,456</td>
<td>8456</td>
</tr>
<tr>
<td>Negative number</td>
<td>Precede with minus sign</td>
<td>–8,456</td>
<td>–8456</td>
</tr>
<tr>
<td>Dollars (currency) cents optional</td>
<td>Precede with a dollar sign,</td>
<td>$8,456</td>
<td>8456</td>
</tr>
<tr>
<td>Percentage</td>
<td>Follow with percent sign</td>
<td>84%</td>
<td>0.84</td>
</tr>
<tr>
<td>Fraction</td>
<td>Separate numerator and denominator with a slash</td>
<td>3 1/5</td>
<td>3.5</td>
</tr>
<tr>
<td></td>
<td>WARNING: precede any fraction by a whole number or it will be converted to a date</td>
<td>0 2/8</td>
<td>0.25</td>
</tr>
<tr>
<td>Date</td>
<td>Several formats are permitted; Excel tries to match entry with one of its built-in date formats</td>
<td>Jan 92 becomes Jan-92</td>
<td>1/1/1992</td>
</tr>
<tr>
<td></td>
<td></td>
<td>May 5,1945 ▶ 5-May-45</td>
<td>5/5/1945</td>
</tr>
<tr>
<td>Time</td>
<td>Separate hours, minutes, and seconds by colons</td>
<td>5:30</td>
<td>5:30:00 am</td>
</tr>
<tr>
<td></td>
<td>Excel converts both cell and formula bar; am assumed &amp; added to all but 12</td>
<td>12:25</td>
<td>12:25:00 pm</td>
</tr>
<tr>
<td></td>
<td>WARNING: Two digits followed by a colon becomes a date</td>
<td>6 pm becomes 6:00 pm</td>
<td>6:00:00 pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16:20</td>
<td>4:20:00 pm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20: becomes 20:00</td>
<td>8:00:00 pm</td>
</tr>
</tbody>
</table>

Fortunately, Excel’s multileveled number format lets you predetermine the format you want. Also, you can apply number formats to a range of cells before or after you enter data in order to speed data entry or to improve the appearance of your final printout. Format/Number takes you to the Number Format dialog box, shown in Figure 11.23, where you can set or change your data’s display format.
Row Width and Column Height

Worksheet cells have standard dimensions. A new worksheet opens with each column ten characters wide and each row a standard height based on the default font and size. Width and height dimensions affect an entire column or row—otherwise the spreadsheet's grid organization would be lost. In other words, when you change the width or height of one cell, you change all the cells in that column or row concurrently.

Cell width and height can be changed easily. The pointer becomes a double-headed arrow whenever it touches a separation line between column or row headings, as in Figure 11.24. The double-headed arrow drags the separation line to expand or shrink a column or row.

The reference area displays the changing width or height (11.14 characters in Figure 11.24), and a dotted line extends the arrow's position into the worksheet itself to show the new size. When the mouse button is released, the grid adjusts accordingly. Figure 11.25 shows the expanded column A.

Alignment

Data may be right-aligned, centered, or left-aligned within a cell. When you make a data entry, Excel determines if the entry is a value or a label, and aligns the cell's data accordingly. With Excel's default cell alignment, labels are
left-aligned and values are right-aligned to show you how each cell may be formatted and used. Figure 11.26 shows how default justification makes it easy to distinguish the labels from the values.

You probably won’t want to keep the default alignment in your finished worksheet; it is more readable if column headings, such as FY1991, line up with the numeric data. The Toolbar alignment buttons (see Figure 11.4) can be used to change cell alignment.

Page Setup

Some of the most dramatic ways to customize your worksheet are found in the Page Setup dialog box shown in Figure 11.27. Not only does Page Setup let you change page margins, paper size, and orientation as it did in MS Word, but the Excel Page Setup box does much more.

You can center your worksheet horizontally, vertically, or both. You can print with or without grid lines or row and column headings. You can enlarge or reduce the entire worksheet to fit on a single page, or series of pages. You can customize your headers and footers. And, in case all of this is too confusing, you can even press a Help button. The next Guided Activity will give you practice with all these formatting choices.
Guided Activity 11.3 uses the Introducing Excel worksheet you began in Guided Activity 11.2. First, you will change the data in some cells to become more familiar with Excel’s default cell alignment. Then, you will format characters and numbers. Finally, you will adjust column width and row height, preview the worksheet, modify page setup, customize the header and footer, and print the document. By the end of this activity, you will have a better understanding of the relationship between Excel’s default settings and its many formatting choices.

1. Open the Introducing Excel worksheet on your data disk.

2. Change a value. Washington 1991 sales were $10,462, not $10,000.
   a. Select C8.
   b. Drag across the characters 000 in the formula bar. The selected characters will highlight, as in Figure 11.28.
   c. Type 462. The new text will replace the highlighted selection. Also, cell C8’s alignment will change to show that the cell’s contents are being edited, as in Figure 11.29.
d. Press the [Enter] key to enter the new value into C8 while keeping that cell active. The new value will appear in C8, and the total in C9 will also change accordingly. Whenever a cell’s value changes, other cells whose values depend upon that cell’s values also change, as in Figure 11.30.

3. Modify step 2 to edit the values in three more cells, observing cell alignment as you edit.
   a. Change E5’s value to 20953.
   b. Change E8’s value to 28971.
   c. Change D13’s value to 15000.

   Here, it is faster to retype the new number than to select and type over. Whenever you select a cell and start typing, the new value or label replaces the old. It is not necessary to select the old value or label first; activating the cell is enough.

   **NOTE** Excel’s automatic cell replacement can be either good or bad. If you are not careful, you can replace data accidentally when you did not intend to do so.

4. Use Undo. Change D15’s label to 26000, and press [Enter]. Choose Edit/Undo ([Z]) to restore the cell’s contents to 25600. When you do, the sum based on that cell will also be restored.

5. Save.
   b. Click the Toolbar’s bold button to bold the cell’s contents.
   c. Click the Toolbar’s enlarge button three times to change the type size from the default 10 points to 18 points.

   Each time you click the enlarge button, the point size increases one increment, according to this scale: 9, 10, 12, 14, 18, 24, 36. Note that the row height automatically increased to accommodate the larger text.
   d. Click the Toolbar’s decrease button once to shrink the text back to 14 points.

   The row height shrunk accordingly. The decrease button decreases font size according to the same scale as the enlarge button.

   **NOTE** Excel’s Toolbar does not display font or size. To verify that the text in cell A1 is 14 points, you can choose Format/Font to view the Font dialog box. Click Cancel if the font is 14 points, otherwise change the font to 14 points and click OK.

   e. Press **Return**. **Return** is a shortcut that enters the data in the current cell and simultaneously moves down a cell, in this case to A2.

   **NOTE** Pressing **Enter** keeps you in the same cell, while pressing **Return** changes your cell location.


8. Bold A4 and press **Tab**. **Tab** is a shortcut that simultaneously accepts the data in the current cell, and moves a cell to the right, in this case to B4.

9. Select the range B4:B15 and click the bold button. Apply format changes to a block of cells by first selecting them and then applying the format desired.

10. Click row heading 11 and then click the bold button. When you click a row or column heading, you select the entire row all the way through the worksheet, as in Figure 11.31.

11. Right align the FY year headings.
   b. With **Shift** held down, drag across cells C11:E11. **Shift** allows you to select discontinuous ranges, blocks of cells that are not connected to each other. Figure 11.32 shows how your window should appear.
Selection of discontinuous ranges, color monitor

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Idaho</td>
<td>10111</td>
<td>13400</td>
<td>20900</td>
</tr>
<tr>
<td>Montana</td>
<td>22100</td>
<td>24050</td>
<td>27890</td>
</tr>
<tr>
<td>Oregon</td>
<td>13270</td>
<td>15670</td>
<td>19850</td>
</tr>
<tr>
<td>Washington</td>
<td>10000</td>
<td>21500</td>
<td>28970</td>
</tr>
<tr>
<td>Total</td>
<td>55481</td>
<td>74620</td>
<td>97610</td>
</tr>
<tr>
<td>Utah</td>
<td>23400</td>
<td>25600</td>
<td>26500</td>
</tr>
<tr>
<td>Arizona</td>
<td>14760</td>
<td>21030</td>
<td>24620</td>
</tr>
</tbody>
</table>

NOTE Discontinuous ranges highlight, but they do not have thick borders or fill handles since you cannot drag discontinuous ranges to new locations nor fill their values to adjacent cells.

c. Click the Toolbar’s right align button.

12. Center the text in cells A1 and A2 across the top of the page.
   a. Highlight the range A1:F2.
   b. Click the center across columns button. This tool centers text from one cell across all selected blank cells in a row, as in rows 1 and 2 of Figure 11.33.

13. Bold and italicize the sales totals, B9:E9, B16:E16. (Figure this one out yourself.)

14. Save.

15. Shrink column A.
   a. Position the pointer on the border between column headings A and B so that the pointer becomes a double-headed arrow. The pointer should become a double-headed arrow as in Figure 11.34.
   b. Drag left until the dotted line is just to the right of Northwest in A4 and release the mouse. Column A will shrink to resemble Figure 11.35.

16. Column A is now too narrow, so expand it by dragging the double-headed arrow to the right until you like the position. Notice that the worksheet titles move so that they stay centered as you change the width of the worksheet.

17. Shrink column C to a width of 3.57 characters and compare the label cells (FY1991) with the cells that contain values.
Whenever you shrink a value cell so much that all its data cannot be displayed in the cell, Excel displays a series of italicized number symbols, ##, to signify that the value has more digits than the width of the cell can display. You may also see these symbols if you bold a value, or change the number format to require more characters.

Label cells are treated differently. If the neighboring cell is empty, the label can spill over into the neighboring cell(s). If the neighboring cell is not empty, the oversized label is truncated, or cut off. Figure 11.35 shows the truncation of cell C1 such that FY1991 becomes 991.

18. Undo to restore the original width to column C (10.00).

19. Save and choose File/Print Preview. As Figure 11.36 illustrates, the worksheet will be offset to the left if it is printed this way.

20. Alter the worksheet's page setup.
   a. Click the Setup button at the top of the preview screen to reach the Page Setup dialog box.
   b. Click the Center Horizontally box (as in Figure 11.37) to balance the document on the page.
   c. While you're here, click the Cell Gridlines box to remove gridlines from the printout. Each of these boxes is a toggle.
   d. Click OK to return to the preview screen.

**NOTE** Ignore steps e–g if you have a full-page monitor.
e. Click the Zoom button to see the worksheet at full size.

f. Scroll to see the default header and footer. Excel's default header contains the file's name; the default footer contains the computer-generated page number.

g. Click Zoom again to return to reduced size.

21. Change the header and footer.

a. Click the Setup button.

b. Click the Header button to display the Header window shown in Figure 11.38.

c. Highlight &F, and type your name instead.

d. Click OK to close the box and return to the Setup box.

e. Click OK again to return to Print Preview.

f. Click Close to return to the worksheet.
22. Format the sales numbers.
   b. Choose Format/Number to reach the Number dialog box.
   c. Click Currency, and leave the top right setting, as shown in Figure 11.39.
   d. Close the Number Format dialog box.

23. Examine your worksheet to be sure that all the values are still displayed with the larger number format. Expand any columns that display ### symbols.

24. Save, preview one last time (Figure 11.40), and print.
Charts are graphic presentations of worksheet data. They are used for presentation purposes, to provide an instant, visual analysis of some or all of your data. Excel provides an extensive gallery of chart and graph formats, and a built-in tool called the Chart Wizard that leads you step by step through chart creation and manipulation.

GUIDED ACTIVITY 11.4

Using the Chart Wizard

Guided Activity 11.4 shows you how to use the Chart Wizard tool to add two charts to your Introducing Excel worksheet to compare West and Northwest sales projections visually. Begin with the Introducing Excel worksheet open.

1. Expand the height of row 10 to 165 points to make room for the first chart. Watch the status area as you expand the row height to get the correct measurement.

2. Create the first chart.
   a. Select the first range to chart, B4 through E8.
   b. Click the Chart Wizard button near the right end of the Toolbar.
      Three things will happen. The pointer becomes a cross-hair, a moving dotted line surrounds the selected range, and the status bar instructs you to drag in the worksheet to create a chart.
   c. Draw a rectangle in expanded row 10 where you want the chart to appear. The chart’s size is approximate. You will adjust it later.
      As soon as you release the mouse button, a window showing the first of five steps will appear.

   d. Check that the range matches that in Figure 11.41. (If not, edit it now in the range box.)
   e. Click Next to see Step 2, a window that shows Excel’s chart and graph gallery.
f. Click the Area chart in the upper-left corner of the window to highlight it (as in Figure 11.42), and then click Next. Each chart category can be displayed in several different ways, called formats.

g. Click format 1 in the upper-left corner to highlight it as in Figure 11.43 to select this format. Then click Next.

Step 4 displays a miniature of the chart. Don’t worry about the scrambled text of the state names (Figure 11.44); you’ll fix them later.

h. Click Next to go to Step 5 where you can add a title to your chart (as in Figure 11.45).

i. Type Northwest, and click OK to return to the worksheet.
The chart will appear somewhere on your worksheet. It will probably look very strange, with overlapped text or other problems as in Figure 11.46. The chart’s selection handles on its sides and corners let you manipulate its size to correct the display.
j. Widen the chart. Move the pointer over the right center handle. The pointer becomes a **resize arrow**. Drag right to widen the chart until all the states' labels are in a horizontal line. Your chart will now be about 6 inches wide.

k. Manipulate the chart's height by dragging one of the top or bottom handles. Taller charts accentuate data differences, and shorter ones de-emphasize them. Finish with a height that you like—as long as it is not wider than row 10.

l. Position the chart on the worksheet. Move the pointer to the center of the chart. Press the mouse button, drag the chart to where you want it, and release.

3. Save and then preview the document to see how it looks, so far. Your document should resemble Figure 11.47.

4. Adapt Step 2 to create a second chart using range B11:E15.
   a. Title this chart **West**.
   b. When you size and position it, be careful not to cross over any dashes. They represent page breaks (delineated in Figure 11.48).
5. Save and Preview. Make adjustments as indicated. (You may want to center both horizontally and vertically.) Figure 11.49 shows the preview of the completed Introducing Excel document.

6. Save and Print the worksheet and its accompanying charts.

7. Quit Excel.

Summary

Unit 11 has shown you how the computerized matrix called the spreadsheet facilitates the recording, calculating, and analyzing of numeric data. The matrix consists of lettered columns and numbered rows whose intersections are called cells. Given the more than four-million potential cells in the Excel matrix, each cell is "named" or referred to by its cell reference, the combination of its column and row headings.

Calculable values and descriptive labels can be placed into spreadsheet cells. Constants are values that don’t change even if the values of other cells change.
Formulas are values that are based on other values. You can either create your own formulas, or use Excel’s 130-plus built-in formulas called functions.

Once you create a worksheet, Excel provides many options to make each worksheet more attractive and readable. You can format characters, change cell alignment, create labels that center across a range of cells, adjust column width or row height, and in other ways control the worksheet’s printed appearance. Finally, you can create and format graphical charts of specified areas of your worksheet, to make its results more understandable.

People use spreadsheets to perform calculations, to analyze numeric data, and to use the results of these calculations and analyses to develop models and predictions. Unit 11 has shown you the spreadsheet’s mechanics. Unit 12 will demonstrate how spreadsheet data can be used to solve practical problems.

---

Command Review

Activate a cell  
Click the cell. Its reference will appear in the formula bar. You may now enter data or edit its contents.

Select a range  
Drag from one end of the range to the other. The selected range may be formatted, moved, copied, or in some other way manipulated as a unit.

Deselect a cell or a range  
Click somewhere else in the worksheet, or press an arrow key.

AutoSum a cell range  
Activate the cell where the sum value is to appear. Click the AutoSum button, verify that the range to sum is correct or edit the range in the formula bar, and press Enter. The result of the sum calculation will appear in the active cell.

AutoFill  
Drag the fill handle of the selection border in the appropriate direction. This allows you to paste cell contents into adjacent cells to create a series of fixed or incremental values.

Save  
Choose File/Save, press [F5], or click the Save button in the Excel Toolbar. This updates changes to an already saved worksheet, or displays the Save As dialog box for an unsaved worksheet, such as Worksheet 1.

Preview  
Choose File/Print Preview. This displays a screen preview of the to-be-printed worksheet.

Format/Font  
Displays the Font dialog box where you can format the font, type style, size, or color of selected text.
**Exercises**

Examine how Excel modifies number formats. Open a new Excel document. One at a time, enter these numbers in the formula bar, accept the entry, then compare what you actually typed to how Excel formats the number when it accepts it and how Excel modifies the number for calculation in the formula bar. Complete the following table:

<table>
<thead>
<tr>
<th>Type and accept</th>
<th>Cell</th>
<th>Formula Bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. ( \frac{1}{2} )</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>2. 15%</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>3. -3.5</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>4. 7:30</td>
<td>_____</td>
<td>_____</td>
</tr>
<tr>
<td>5. June 1, 1963</td>
<td>_____</td>
<td>_____</td>
</tr>
</tbody>
</table>

**Review Questions**

**Multiple Choice**

1. Spreadsheet applications perform mathematical operations on numeric data. Spreadsheets help people to
   a. record data
   b. calculate data
   c. analyze data
   d. all of these

2. Each cell reference indicates the point of a column and row intersection. Which of these is a cell reference?
   a. EZ4U
   b. 2GO4S
   c. H25
   d. COMPU2R
3. These are all cell contents. Which one is probably a label?
   a. 83
   b. 2/5
   c. monthly income
   d. =SUM(A2+Y6)
4. How many cells can be highlighted at one time?
   a. only one; the active cell
   b. 256
   c. as many as you choose
   d. an entire row or column
5. A cell displays #### when
   a. you enter a telephone number
   b. you enter a formula
   c. the cell’s value is too long to fit in the cell
   d. the cell’s label is too long to fit in the cell

**True or False**

1. ____ A spreadsheet document is called a worksheet.
2. ____ All cell editing is done in the status bar.
3. ____ In the spreadsheet, [Return] automatically accepts the entry from the formula bar and activates the cell below it.
4. ____ Select a range to do something to the group of cells all at once.
5. ____ You can only create one type of chart in Excel.

**Fill In the Blanks**

Identify the spreadsheet landmarks in Figure 11.50.

1. ____________ 5. ____________
2. ____________ 6. ____________
3. ____________ 7. ____________
4. ____________ 8. ____________
Key Terms

- Active cell
- AutoFill
- AutoSum button
- Border
- Cell
- Cell reference
- Center across columns button
- Chart Wizard
- Charts
- Column
- Column heading
- Constant
- Cross pointer
- Default cell alignment
- Deselect a range
- Discontinuous range
- Double-headed arrow
- Fill handle
- Formula bar
- Formula
- Function
- Hollow cross pointer
- HyperCard
- Labels
- Menu bar
- Number format
- Range
- Range reference
- Reference area
- Resize arrow
- Row
- Row heading
- Status bar
- Toolbar
- Value
- Worksheet
Unit 12 demonstrates how spreadsheets can be used to analyze problems and to develop informed solutions. First, you will follow the steps to plan, to implement, and to test a simple budget worksheet. Next, you will see how the worksheet can be used to solve a common practical problem—the purchase and maintenance of a used car. Finally, you will create and use a financial template to calculate quickly the annual return of various bank certificates of deposit.

By the end of Unit 12, you will be able to use Excel to plan, to create, and to test worksheets; to use worksheets as analytic tools, and to save a worksheet as a reusable template to facilitate the solution of other, similar problems.

Learning Objectives

At the completion of this unit, you should know

1. the steps to spreadsheet design,
2. the distinction between "keeping score" and analysis,
3. how the spreadsheet is used as an analytic tool,
4. how the placement of a worksheet's primary values into a key area facilitates what-if analysis,
5. that window panes allow you to view discontinuous parts of a large document,
6. the distinction between relative and absolute cell reference,
7. that templates are analytic time-savers.
At the completion of this unit, you should be able to

1. create and use a new worksheet:
   a. plan its organization
   b. enter sample data
   c. test formulas
2. format cell borders and shading,
3. insert and delete columns and rows,
4. use absolute cell reference in appropriate formulas,
5. establish, manipulate, and remove a worksheet’s window panes,
6. view and print a worksheet with formulas rather than values displayed,
7. use the Formatting Toolbar to change decimal places displayed,
8. print only part of a worksheet and then restore full print ability,
9. create and use worksheet templates,
10. use worksheets to develop different solutions to financial questions.

**Spreadsheets and Thinking**

Spreadsheets don’t think; they just calculate numbers. Neatly ordered columns and rows of data shining at you on the computer screen or marching out of the printer can seem magical—but they are not necessarily true. If you write a formula that adds your taxes to your gross income instead of subtracting them, then that is exactly what the computer will do. Remember, the computer is a very dumb machine.

So, use the spreadsheet for what it does well. Remember the origin of the spreadsheet, blank green ledger paper? They’re blank. You do the thinking, have the computer do the numbers, and the division of labor will work well. Both the elegance and the challenge of the spreadsheet is that you control the organization that turns a blank grid into a meaningful document.

**Top-Down Design to Spreadsheet Development**

Computer programmers use a structured approach to problem solving called top-down design that will help you to design and to use effective worksheets. Top-down design progresses from the general to the specific. You ask a question, decide what you need to know to answer the question, and plan and use one or more worksheets to find answers to the question. Top-down design worked well to solve a problem that occurred a few years ago in the Heiman household.
**Background**

Tammy, age sixteen, fell in love—with a 1974 bottle green Fiat coupe. With her new driver’s license in hand, some money in the bank from a lifeguard job the previous summer, and a part-time job at the local pizza parlor, she had to have that car. Unfortunately, the “totally restored” fourteen-year-old import lived up to its name, Fix It Again, Tammy. In the first year that Tammy had her car, she spent as much on car repairs as on her initial purchase, and then the car broke again. What was she to do?

**Defining the Problem**

The first step in spreadsheet design is to define the problem. What are you trying to organize? What question are you trying to answer? In Tammy’s case, there were several questions:

- Could Tammy afford to fix her car?
- Even if she could afford it, should she?
- How long would it be until the car broke down again?
- Are there other choices?

Defining the problem means providing a clear, precise understanding of what to do. Therefore, Tammy’s problem became:

- Should Tammy continue to spend money on her classic Fiat, or would it make more sense to sell the car?

**Outlining the Solution**

The solution outline is a list of what you need to know to solve the problem or answer the given question. In outline format, Tammy needed to know:

I. How much will it cost each month to operate the Fiat?

II. How much money would she have to spend on her car each month?

III. Could she afford to keep the car?

Once Tammy had the answer to these questions, she could use that information to make an informed decision about repairing her car.

**Developing a Step-by-Step Plan**

The recipe for finding the right answer to a difficult problem is to break it down into smaller steps. Let’s break Tammy’s outline into smaller parts:

I. How much would it cost each month to operate the Fiat?
   a. Gas/oil
b. Repairs

c. Automobile Insurance

II. How much money would she have to spend on her car each month?

a. How much money would she have available each month?
   1. Savings
   2. Allowance
   3. Job

b. What other expenses did she have?

III. Could she afford to keep the car?

a. Would she have enough money each month to operate the car?

b. If not, what could she do to generate more money?

c. Was it worth it?

To use the spreadsheet, we need to convert the outline to a table. How should it be arranged? Take a pencil and paper and sketch it out.

**FIGURE 12.1**

<table>
<thead>
<tr>
<th>Sketch out the Worksheet, Including Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Money Out</strong></td>
</tr>
<tr>
<td>Car Expenses</td>
</tr>
<tr>
<td>Gas/Oil</td>
</tr>
<tr>
<td>Repairs</td>
</tr>
<tr>
<td>Insurance</td>
</tr>
<tr>
<td>Clothing</td>
</tr>
<tr>
<td>School Supplies</td>
</tr>
<tr>
<td>Entertainment</td>
</tr>
<tr>
<td><strong>Monthly Expenses</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Money In</strong></td>
</tr>
<tr>
<td>Savings</td>
</tr>
<tr>
<td>Allowance</td>
</tr>
<tr>
<td>Summer Job</td>
</tr>
<tr>
<td><strong>Monthly Income</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Money Left at Month End</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Apr-90</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>May-90</strong></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Implementation

Now that you have determined what data is needed and how to organize it, you can use the spreadsheet application to develop solutions to Tammy’s car problem.
Guided Activity 12.1 shows you how to create the worksheet planned in Figure 12.1 to analyze Tammy’s car problem. You will test and use the worksheet in subsequent Guided Activities. Begin at the Desktop.

1. Open the Excel application. It will display a blank, unsaved worksheet called Worksheet 1.

2. Enter the labels in the cells shown in Figure 12.2.

   ![Figure 12.2](image)

   - Click B1 to activate it, type Apr-90, and press Enter.
   - Activate A2, type Money Out, and press Return to accept the entry and activate the cell below, A3.
   - Type Car Expenses, and press Return to accept the entry and activate A4.
   - Adapt step c to continue entering labels until you reach A19.
   - Proofread labels on screen, and correct any errors in spelling or capitalization.
     - Click the cell to edit.
     - Make needed corrections in the formula bar.
     - Press Enter to accept changes.

3. Save your worksheet to your data disk as Car Problem.

4. AutoFill the dates for the rest of the year.
   - Activate B1.
b. Place the pointer over the fill handle (small cross pointer) and drag to J1. J1 is to the right of the window. When you reach the right window border, the worksheet will scroll right automatically.

c. Release the mouse button and Excel will fill in the date series.

5. Use the Goto command to go to A1. Goto scrolls the worksheet and selects the cell or range you specify. It is indispensable when your worksheet is larger than the document window. Goto stores the last four cell or range references in the scroll box, and makes it easy to go to a distant location and then return to where you began.

a. Choose Formula/Go To (F5) to display the Goto dialog box shown in Figure 12.3.

![Goto dialog box](image)

b. Type the destination, A1, and it will appear in the Reference box. It doesn’t matter if A is capitalized or not.

c. Click OK to change your window view to display and activate A1.

6. Format the labels.

a. Click row heading 1 to select the entire row. Bold it. When you format an entire column or row, it affects both filled and empty cells. Therefore, data entered into any cell in row 1 will appear in bold type.

b. Click column heading A to select the entire column and bold it. Cell A1 is already bold. Because the column is not uniformly formatted, you will have to click the bold button twice—once to unbold cell A1, and once again to bold the entire column.

c. Select A3:A9 and A13:15 and click the bold button again to unbold. (Use the shift key to select the discontinuous ranges.)

d. Select A4:A6 and right align.

e. Select A2, A10, A12, A16, and A18 and center their text. (Use the shift key to select the discontinuous cells.)

**NOTE** Some cell data will not be displayed. You will fix it soon.
f. Select the entire worksheet (see Figure 12.4) and click the Toolbar’s decrease font size button once to reduce the font size to 10 points. To select the entire worksheet, click the rectangle between column A and row 1.

![Select the entire worksheet](image)

FIGURE 12.4
Select the entire worksheet

314 PART THREE DATA INTO INFORMATION

- Decrease font size button

- To select the entire worksheet, click here.

- Wrap Text

- Wrap the text in A18 to fill more than one line.
  - i. Select A18.
  - ii. Choose Format/Alignment.
  - iii. Click the box that says wrap text in the bottom left corner of the Alignment dialog box, and click OK.

- Have Excel automatically adjust column widths to their Best Fit.
  - i. Select the entire worksheet.
  - ii. Choose Format/Column Width.
  - iii. Click Best Fit. Best Fit shrinks or expands each selected column that contains data to the width of its longest entry, up to 255 characters.

**NOTE** Sometimes Best Fit produces good screen results, but truncates cell data when previewing and printing. To remedy:

- iv. Choose Print Preview.
- v. Click the Margins button to adjust margins and column widths from the Preview window. Boxes will appear at the top of each column border (see Figure 12.5 window).
- vi. Drag the box of each truncated column to the right until you can see all its data.

![Print Preview window, margins button clicked; your window will not have all the data shown here](image)

FIGURE 12.5
Print Preview window, margins button clicked; your window will not have all the data shown here
7. Save. Your worksheet should resemble Figure 12.6.

8. Enter test data (values for the first month, Apr-90).
   
   B4: 45
   B5: 200
   B6: 408
   B13: 500
   B14: 100

   a. Select B10 and click AutoSum.
   b. Check that the formula bar displays the formula \( = \text{sum(B4:B9)} \) and Enter.

10. AutoSum the Monthly Income for Apr-90 in B16.
    a. Select B16 and click the AutoSum button.
    b. Check that the formula bar displays the formula \( = \text{sum(B13:B15)} \) and Enter.

11. Create a formula to calculate the Money Left at Month End in B18.
    a. Select B18.
    b. Type the equal sign, \( = \). Every formula must begin with an equal sign to tell Excel that a formula follows.
    c. Click B16 to place its address into the formula.
    d. Type a minus sign, \(-\).
Spreadsheets use arithmetic operators to perform many calculations. The operator '+' adds, '-' subtracts, '*' multiplies and '/' divides. The number pad to the right of the keyboard was created to enter numbers and operators rapidly.

e. Click B10 to place its address into the formula. The formula should read =B16-B10.

f. Enter the formula into the cell, which should display the number -53.

12. Change the number format of B3:J18 to value type Number with two decimal places, as shown in Figure 12.7.

13. AutoFill your Sum formulas for monthly expenses and income to the right, through column J. Beyond the first month, the income and expense cells will display zeros, since you have not yet entered these months' values into the worksheet.

14. Type the formula =B18+(C16-C10) into cell C18. This formula will accumulate gain or loss for each month.

15. AutoFill C18 to the right, through J18. Each filled cell will display -53.00 until you input more data.

16. Save. You have now created the basic worksheet, and are ready to test and use it.

Test Results

Whenever you create a new worksheet, or change formulas on an existing one, you should verify the calculations manually to be sure you have created each formula correctly. This process is called testing the worksheet. Perform your calculations by hand, or with a calculator, to be sure that your formulas give you the results you expect.
GUIDED ACTIVITY 12.2

Testing The Worksheet

Guided Activity 12.2 continues from Guided Activity 12.1. You will calculate the results of your formulas to be sure they match those displayed in the worksheet.

1. By hand or by calculator, add up the monthly expenses: 45, 200, and 408. They should equal 653 dollars. If cell B10 does not display 653.00, then you have typed in an incorrect value, an incorrect formula, or both.

2. Add up the monthly income, 500 and 100. They should equal 600 dollars. If cell B16 does not display 600.00, then you have typed in an incorrect value, an incorrect formula, or both.

3. Subtract the monthly expenses (653) from the monthly income (600). The result should be -53. If cell B18 does not display -53.00, then you have typed in an incorrect value, an incorrect formula, or both.

4. Locate and correct any error(s) on the worksheet.

5. Save. Your worksheet structure and format is complete. You are ready to add more data to develop solutions to Tammy’s car problem.

Using the Spreadsheet

Now it’s time to build a model, to ‘guesstimate’ what might happen to Tammy’s car. As you add data, think of your entries in two parts: score-keeping and analysis. Score-keeping data are the known figures, the data you presumably can count on. In Tammy’s case, she knew what her allowance would be, how much she would earn from her summer job, and what her insurance, gas, and oil costs should be for the next year. She then used analysis to understand her results.

Projection is a form of analysis. First, you analyze the present data to project or to make informed guesses as to what unknown figures will be over a set time period. Then, see how these different guesses affect the worksheet outcome at the end of the projected time period. Projection is also called “what if?” because of the kinds of questions you ask: what if the car needs a $500 repair in two months; what if Tammy got an after-school job, and so on. With each different scenario, you change a few figures in the worksheet, and Excel rapidly calculates the results for you.

GUIDED ACTIVITY 12.3

What If?

Guided Activity 12.3 shows you how to use the worksheet built in Guided Activity 12.1 and tested in Guided Activity 12.2 to analyze potential solutions to Tammy’s car problem. Begin with the Car Problem worksheet open.
1. Keep score before you postulate. Enter the “known” data first. (You decide where to put the data.)
   a. Insurance: $408 every six months, beginning 4/90.
   b. Gas/oil: $45 per month (Tammy’s average monthly expenditure for the previous year).
   c. $100 allowance per month (Tammy’s parents refuse to increase it!). This allowance is to cover all of Tammy’s personal expenses except room and board: clothing, school supplies, entertainment, and so on.
   d. Summer job as a swim instructor: $1300 on 9/1/90. Your worksheet should look something like Figure 12.8.

   ![Figure 12.8 Keeping score worksheet]

2. Analyze the data at this point. What if Tammy’s Fiat didn’t need any repairs after Apr-90? What if Tammy didn’t spend any money except for car insurance, gas and oil? What if Tammy’s summer job worked out OK? If all these conditions held true, Tammy should have had $1279.00 at year end. However, this scenario is not very realistic. Clearly, Tammy will have non-car expenses during the year, and, given the car’s past history, it is unlikely the car will run for eight months without repairs.

3. Add a repair guess for the remainder of the year, $120 per month. During the first year that Tammy had her car, she spent an average of $120 per month on repairs. In checking her records, she discovered an additional expense, vehicle registration.

4. Insert a row for vehicle registration (Figure 12.9), and enter $50 in Jun-90. To insert a blank row into a worksheet, hold down \textit{Option} and click the row heading just below where the new row should appear. (To insert a blank column, \textit{Option} click the column heading to the right of where the new column should appear.)
   a. \textit{Option} click row heading 7 to insert the new row.
b. Enter the label vehicle registration into the new A7 and enter the value 50 into D7. Cell D7 automatically formats the value to two decimal places or 50.00. This vehicle registration cost is included automatically in relevant worksheet calculations (see Figure 12.10). Whenever you add a row or column inside a formula range, any affected formulas are updated to reflect the change.

c. Widen any columns that display #### (or select the entire worksheet and Format Column Width with Best Fit).

5. Divide the worksheet window into vertical panes. Window panes are window divisions that can be scrolled independently so that you can view discontinuous parts of a document. Window panes help you to navigate worksheets larger than the computer screen. Each Excel document window has a vertical and a horizontal split box (identified in Figure 12.11) to permit a window’s on-screen division into a total of four panes. (Window panes do not affect printing.)
FIGURE 12.11
Splitting a window into vertical panes

a. Point to the vertical split box in the bottom left corner of the document window. When the pointer is in the right position, it becomes a split two-headed arrow.

b. Drag right, until the pointer is on the right edge of column A.

c. Release the mouse button. The window will split into two side-by-side panes, each with its own horizontal scroll bars (see Figure 12.11).

d. Scroll the right pane to the right until column I is adjacent to column A. Note that column A, in the left pane, does not move as you scroll the right pane.

6. Re-analyze the data. If the repair estimate is accurate, and if the score-keeping values from step 1 are also accurate, then at year end Tammy would have had $269. However, given this scenario, Tammy applied her entire allowance, her entire summer wages, and her entire savings account towards the car—and spent no money on clothing, entertainment, school supplies, and so on. This solution is, therefore, not very realistic.

7. Extend the data to Dec-91.

a. Select range I1:J18 and AutoFill right through column V. If you select a block two columns deep before you AutoFill, Excel will fill the correct values. Otherwise, AutoFill wants to increment the $100 allowance, adding a dollar every month. (Excel is in Tammy’s favor!)

b. Enter biannual insurance payments of $408, annual vehicle registration of $50, and summer job income of $1300 into the appropriate cells.

8. Analyze the results. In Apr-91, a problem occurred (see Figure 12.12). Tammy could not afford to make her car payment. She had to borrow money from somewhere (mom?? dad??) until her summer money came in. Her 1991 deficit was greater than 1990, since her $500 savings account was gone.

So, Tammy had a problem common to many of us: unless she could generate more money, she had to decrease her expenses and sell her car.
9. Analyze the effects of a potential solution. What would happen if Tammy got a weekend waitressing job that paid about $50 per week, or $210 per month?
   a. **Option** click row heading 16 to insert a row.
   b. Type the label **weekend job** into A16. Scroll the right window pane to the left until you can see column B.
   c. Enter 210 into B16 on the right pane.
   d. AutoFill B16 through V16. Given this scenario, Tammy would have had $4383 by Dec-91. In other words, she could have kept her car and still had money each month for her other expenses. However, she would have had to work every weekend during the academic year, as well as hold two jobs each summer in order to maintain this rosy financial picture.

10. Develop other what if scenarios to solve Tammy's problem and modify the worksheet to test them. Print different versions if you like. What would you do?

11. Choose Window/Remove Split to remove the window panes.

11. Quit Excel.

**Solutions**

What did Tammy actually do? First, she found a waitressing job. After about a month, she learned that maintaining good grades in school, working weekends, and the social life she enjoyed were too much, so she quit the job. Finally, after much anguish, she decided to sell the Fiat, and try to save half of her allowance every month and some of her summer money in a car fund. Now a senior in college, Tammy has worked part time during each school year and full time each summer to support her latest love, a shiny red Volkswagen Fox (with a car payment and an extended warranty).
This year, Tammy took Excel and accounting classes that helped her to understand the financial ramifications of car ownership. She decided to sell the car, buy a shiny red scooter and helmet for the same amount of money as the annual automobile parking permit at her university, invest her car money until graduate school, and quit her part-time job to allow more study time. Now, Tammy had another decision: how should she invest her car money?

**Interest Rate Analysis**

Tammy decided to put her car money in the bank for maximum safety. Her bank has four different under-$5000 certificates of deposit (CDs) to invest in for up to a year. Interest on each is compounded daily. There is a “substantial penalty” if the money is withdrawn before the maturation date.

- 1 month CD @ 2.27%
- 3 month CD @ 2.30%
- 6 month CD @ 2.47%
- 12 month CD @ 2.71%

Guided Activity 12.4 develops a worksheet to analyze these different investment programs.

**GUIDED ACTIVITY 12.4**

**Interest Calculations**

In Guided Activity 12.4 you will create a worksheet template to calculate interest compounded daily. Then you will use the template to help Tammy decide how to invest her money.

**NOTE** You may see different numbers of decimal places on your screen than in the text illustrations. In some cases, the number of decimal places displayed depends on column width.

1. Open a new Excel worksheet.
2. Establish the worksheet’s *key area* as shown in Figure 12.13.

**FIGURE 12.13**

The key area

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td><strong>Amount Invested:</strong> 100</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td><strong>Interest Rate:</strong> 2.27%</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The key area stores *key values*, cells whose values you will want to change as you set up different scenarios to analyze a problem. Isolating key values on the worksheet makes them easy to identify and to change.
a. Type the label Amount Invested: into B1.
b. Type the label Interest Rate: into B2.
c. Provide starting values. Type 100 into C1 and 2.27% into C2.
d. Right justify B1:C1.
e. Left justify B2:C2.
f. Format the key area to distinguish it from the rest of the worksheet.
   i. Select Rows 1:2.
   ii. Bold them.
   iii. Choose Format/Border to display the Border dialog box. The Border
dialog box lets you format borders and shading of selected cells (see
Figure 12.14).

![Border dialog box](image)

iv. Click the Shade box and then click OK.

3. Calculate interest for Day 1.
   a. Enter labels into row 4, pressing (Tab) after each entry.
      A4  Day
      B4  Principal
      C4  Interest Earned
      D4  Daily Total
      i. Bold.
      ii. Right align and wrap text.
c. Enter constants and formulas into row 5, pressing \texttt{Tab} after each entry.
   \begin{align*}
   \text{A5} & \quad 1 \\
   \text{B5} & \quad =\text{C1} \\
   \text{C5} & \quad = (\text{C2}/365) \times \text{B5}
   \end{align*}

   \textbf{Daily Interest Earned} = \textbf{Daily Interest Rate} \times \text{Principal}. The daily interest rate is the annual interest rate divided by the number of days in a year, or 365.

   \begin{align*}
   \text{D5} & \quad = \text{B5} + \text{C5}
   \end{align*}

   \textbf{Daily Total} = \textbf{Daily Principal} + \textbf{Daily Interest Earned}.

   a. Enter constants and formulas into Row 6.
      \begin{align*}
      \text{A6} & \quad = \text{A5} + 1 \\
      \text{B6} & \quad = \text{B5}
      \end{align*}

   b. Fill Down to copy contents from C5:D5 into C6:D6 (see Figure 12.15).

5. Test your formulas. There’s a problem here! Day 2 didn’t earn any interest. Examine the formulas to see what happened.
   a. Choose Options/Display to view the Display Options dialog box (see Figure 12.16).

   b. Click an X next to Formulas and then click OK. Adjust your column widths to just display each cell’s contents. Your worksheet, like Figure 12.17, now displays formulas instead of calculation results. When you display formulas, much of a worksheet’s formatting is temporarily hidden or changed.

   c. Look at the formula in C6. When Excel fills formulas, it adjusts the cell references in each formula in relation to its new location; the relative referencing that you saw in Unit 11. Since C3 is empty, Excel uses a zero for the interest rate, thereby calculating the interest earned Day 2 as zero.
6. Correct the formulas. Adjust the formula in C6 so that it will consistently use the interest rate in C2 when you fill down. Give it an **absolute reference**. At the same time, adjust the formula so that it multiplies the interest rate times the current day’s starting principal, in this case B6.

Absolute reference tells Excel not to change a cell’s location when copying or moving a formula from one cell to another. When you type a formula, placing a dollar sign ($) before the column letter tells Excel to keep the column letter constant, or absolute; placing a dollar sign before the row number keeps the row reference absolute. Placing a dollar sign before both the column and row reference, such as $C$2 keeps the complete cell address absolute or unchanging as the formula is copied or moved to another worksheet location.

a. Select C5.

b. Edit the formula to \( =($C$2/365) * B5 \) and press [Enter].

c. Fill C5 down to C6.

d. Display values. Choose Options/Display, click the box next to formulas to remove the X, and click OK.
7. Select A6:D6 and Fill Down through row 10 (see Figure 12.18).

![Figure 12.18](image)

<table>
<thead>
<tr>
<th>Day</th>
<th>Principal</th>
<th>Interest Earned</th>
<th>Daily Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>100.00</td>
<td>0.00621918</td>
<td>100.0062192</td>
</tr>
<tr>
<td>6</td>
<td>100.0062192</td>
<td>0.00621956</td>
<td>100.0124367</td>
</tr>
<tr>
<td>7</td>
<td>100.0124387</td>
<td>0.00621995</td>
<td>100.0186587</td>
</tr>
<tr>
<td>8</td>
<td>100.0186587</td>
<td>0.00622034</td>
<td>100.024879</td>
</tr>
<tr>
<td>9</td>
<td>100.024879</td>
<td>0.00622073</td>
<td>100.0310998</td>
</tr>
<tr>
<td>10</td>
<td>100.0310998</td>
<td>0.00622111</td>
<td>100.0373209</td>
</tr>
</tbody>
</table>

8. Format the numbers in B5:D10 for two decimal places and commas (see Figure 12.19).

![Figure 12.19](image)

9. Examine the numbers in columns B–D.

![Figure 12.20](image)

<table>
<thead>
<tr>
<th>Day</th>
<th>Principal</th>
<th>Interest Earned</th>
<th>Daily Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>100.00</td>
<td>0.01</td>
<td>100.01</td>
</tr>
<tr>
<td>6</td>
<td>100.01</td>
<td>0.01</td>
<td>100.01</td>
</tr>
<tr>
<td>7</td>
<td>100.01</td>
<td>0.01</td>
<td>100.02</td>
</tr>
<tr>
<td>8</td>
<td>100.02</td>
<td>0.01</td>
<td>100.03</td>
</tr>
<tr>
<td>9</td>
<td>100.03</td>
<td>0.01</td>
<td>100.04</td>
</tr>
</tbody>
</table>

Excel calculates all formulas based on the actual value in each cell (see Figure 12.18), not the rounded values such as those displayed in Figure 12.20. For this reason, the calculations in Figure 12.20 appear “wrong,” but they are not wrong. Displaying more decimal places, however, would make the worksheet less misleading.

10. Show more decimal places.
a. Choose Options/Toolbars/Formatting to display the *Formatting Toolbar* (see Figure 12.21). The Formatting Toolbar contains several formatting buttons to simplify type style and numeric formatting.

![Formatting Toolbar](image)

b. Click the *Increase Decimal tool* twice and close the Formatting Toolbar. Each time you click the Increase Decimal tool, it displays an additional decimal place in the selected cell(s). Now your worksheet shows a gradually increasing daily total (see Figure 12.22).

![Gradually increasing total](image)

11. Divide the window into horizontal panes (see Figure 12.23).

![Horizontal window panes](image)

12. Complete the calculations to determine how much interest would be earned on $100 at 2.27% compounded daily.


   b. Fill Down through row 369. (It takes a long time.)

   Cell D369 displays the total at the end of one year, $102.2959. In other words, this account would pay $2.30 on every $100 invested for a year.
13. Bring the annual interest earned to the worksheet's key area. Type Annual Interest Earned into E1 and =D369-C1 into E2. Use the Format Toolbar to format attractively and meaningfully.

14. Choose Window/Remove Split to view only one window pane.

15. Save the worksheet as a template.
   a. Choose File/Save As (see Figure 12.24).
   b. Click Options to display the Save Options dialog box (see Figure 12.25).
   c. Choose Template from the drop-down File Format menu and click OK.
   d. Name the document investment rates, and click save.
   e. Close the investment rates window.
   f. Choose File/investment rates to reopen the document. The document reopens as investment rates1, preserving the original file.

16. Print only the top part of the document (as previewed in Figure 12.27).
   b. Choose Options/Set Print Area. Frequently, you will want to print only part of a large worksheet. The Set Print Area command tells Excel to print only the selected range. Dashed lines, the page breaks, appear on screen to delineate the print area, as shown in Figure 12.26.
c. Preview and Print the document.

17. Tammy has $4,000 to place into her car fund. Modify the worksheet to determine the differences among her bank’s different interest programs, assuming she renews the shorter duration CDs at the same rate, and invests the money for a full year.

   a. Calculate the yield of the one-month CD annualized. Enter 4000 into cell C1, wait while the formulas recalculate, and Print the worksheet.

   b. Calculate the yield of the three-month CD annualized. Enter 2.3% into cell C2, wait while the formulas recalculate, and Print the worksheet.

   c. Calculate the yield of the six-month CD annualized. Enter 2.47% into cell C2, wait while the formulas recalculate, and Print the worksheet.

   d. Calculate the yield of the twelve-month CD annualized. Enter 2.71% into cell C2, wait while the formulas recalculate, and Print the worksheet.
Tammy learned that the difference between investing her money a month at a time and for the entire year is only $18.04. She decided to choose the one-month plan for two reasons. First, she was not sure if she would need to buy another car in nine months or a year, and the penalty for early withdrawal is more than eighteen dollars. Second, she felt that with interest rates at an historic low, it is unlikely they would go lower. With the month-to-month investment, she will receive more interest if rates rise during the coming year.

18. Make the entire worksheet printable again.

a. Select the entire worksheet.

b. Choose Options/Remove Print Area.

19. Quit Excel.

Summary

Unit 12 has shown you how to use top-down design to plan, to build, to test, and to use worksheets to solve problems. Using worksheets larger than the Macintosh screen, you learned to go directly to a designated cell. You divided your document window into window panes to simultaneously view discontinuous worksheet segments. You isolated key values into a key area for easy identification and modification. You observed the distinction between relative and absolute referencing, and used each in formulas. You saw how number formatting can display misleading results, and how to minimize the equivocal effects. You set print areas to print only part of a large worksheet, and then removed the print area to restore print ability to the entire document. Finally, you saved your worksheet in stationery format, so that you could reuse it without accidentally modifying the original.

Command Review

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goto</td>
<td>Choose Formula/Goto or type ⌘G. This scrolls the worksheet to highlight the cell or range you specify.</td>
</tr>
<tr>
<td>Select whole worksheet</td>
<td>Click the rectangle between column A and row 1.</td>
</tr>
<tr>
<td>Insert a row</td>
<td>Option click the row heading just below where the new, blank row should appear.</td>
</tr>
<tr>
<td>Insert a column</td>
<td>Option click the column heading just to the right of where the new, blank row should appear.</td>
</tr>
<tr>
<td>Divide window into panes</td>
<td>Drag horizontal and/or vertical split box to desired split location, and release. Each pane is an independent, scrollable sub-window.</td>
</tr>
</tbody>
</table>
### Exercises

##### Computer Practice

In each of the following exercises you will plan, create, and use a worksheet. For each, place your name and date in the footer, and a descriptive title into the header. Modify the header to distinguish between different versions of the same worksheet. Format each worksheet for clarity and attractiveness. Be careful to display enough decimal places so that your worksheets are not misleading.

---

<table>
<thead>
<tr>
<th>Exercise</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remove split</td>
<td>Choose Window/Remove Split. It removes panes to restore the window to a single scrollable unit.</td>
</tr>
<tr>
<td>Best Fit</td>
<td>Choose Format/Column Width/Best Fit. It shrinks or expands each selected column to the width of its longest entry. (May give poor printing results. Refer to the unit itself for correction procedure.)</td>
</tr>
<tr>
<td>Set Print area</td>
<td>Select range to print and choose Options/Set Print area. It restricts printing to the selected range.</td>
</tr>
<tr>
<td>Remove Print area</td>
<td>Select entire worksheet and choose Options/Remove Print Area. It restores print ability to the entire worksheet.</td>
</tr>
<tr>
<td>Display formulas</td>
<td>Choose Options/Display, Click X in Formulas and click OK. It displays formulas in worksheet cells.</td>
</tr>
<tr>
<td>Display values</td>
<td>Choose Options/Display, click to remove X in Formulas and click OK. It displays values in worksheet cells (the default).</td>
</tr>
<tr>
<td>Display Format Toolbar</td>
<td>Choose Options/Toolbars/Formatting. It displays the Format Toolbar that contains many tools for quick cell formatting.</td>
</tr>
<tr>
<td>Hide Format Toolbar</td>
<td>Click its close box.</td>
</tr>
<tr>
<td>Increase decimal display</td>
<td>Click the Increase Decimal tool on the format Toolbar. Each click displays an additional place to the right of the decimal point.</td>
</tr>
<tr>
<td>Decrease decimal display</td>
<td>Click the Decrease Decimal tool on the format Toolbar. Each click removes an additional place to the right of the decimal point.</td>
</tr>
</tbody>
</table>
1. Create a personal budget.

Plan, create, use, and chart a worksheet that estimates your income and expenses for the coming year. Analyze the data to suggest ways that you could improve your financial comfort.

a. With pencil and paper, write out your major sources of income and expense. Try to be specific.

b. Place your income and expense categories onto a worksheet. Enter data for the first month, and create formulas to sum your monthly income, monthly, and cash left at the month’s end, like Tammy’s budget in the Guided Activities.

c. Provide numbers for each income and expense category for the coming year, using AutoFill where numbers repeat. (You may wish to use two different worksheets; one with fictitious numbers to turn in, and one with “real” projections for yourself.)

d. With the help of the Chart Wizard (see Unit 11), chart your income and expenses for the year.

e. Analyze your worksheet(s) and charts. Which is easier to understand? Do you anticipate a comfortable financial picture for the coming year?

f. Make changes to your worksheet(s). Short of winning the lottery, what could you do that would improve your financial situation realistically? Print two worksheets, appropriately titled, to reflect two different plans to improve your finances. Chart the results of each for comparison.

g. Word process a paragraph or two that explains how you planned your worksheet and how you can apply this analytical process personally.

2. Plan a party.

You are planning a large party, such as a high school reunion, a wedding, a fund raiser, or a family reunion. The spreadsheet can help you both to remember what you need to do, and to keep track of costs.

a. Predetermine a dollar amount that is the most you can spend on the event, and estimate how many people are expected to attend. Use these to generate your cost per person. (You will learn more if you keep this figure realistic.)

b. With pencil and paper, make a specific list of everything you will need to purchase, including site rental, entertainment, labor costs, and gratuities.

c. Use the spreadsheet to add up your itemized expenses, and compare your projected expenses to the money you have budgeted for the party.

d. Use your party budget to develop three different scenarios, and print out three different versions of your worksheet.

e. Word process a brief analysis of the effects of each scenario.
3. Make a checkbook register.

Many people suffer from overdrawn checkbooks. A checkbook register worksheet can let you keep track of how much money you have (or don’t have) in the bank—before it is a negative number. Again, you may wish to use fictitious numbers for any work turned in. Use Figure 12.28 to get started. Enter and print one month’s transactions.

![Checkbook register](image-url)

**FIGURE 12.28** Checkbook register

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Check</strong></td>
<td><strong>Number, Deposit, or Misc.</strong></td>
<td><strong>Date</strong></td>
<td><strong>Category</strong></td>
<td><strong>Amount</strong></td>
<td><strong>Ending Balance</strong></td>
</tr>
<tr>
<td>1</td>
<td>Beginning Balance</td>
<td>$500.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Check</td>
<td>Date</td>
<td>Category</td>
<td>Amount</td>
<td>Ending Balance</td>
</tr>
<tr>
<td>4</td>
<td>deposit</td>
<td>10/27/93</td>
<td>rent</td>
<td>($250.00)</td>
<td>$250.00</td>
</tr>
<tr>
<td>5</td>
<td>deposit</td>
<td>10/28/93</td>
<td>paycheck</td>
<td>$358.24</td>
<td>$608.24</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Mathematical Prodigy

Karl Gauss (1777–1855), the founder of modern mathematics and statistics (the bell curve), reported that he could count before he could talk. The first day of the school year when Gauss was ten, his teacher, Herr Butner, had many administrative duties to perform. To keep the class busy, each student was asked to calculate the sum of all the numbers from one to one hundred. To Herr Butner’s surprise, Karl took only ten seconds to solve the problem; each of the other boys spent more than an hour, and not one of them had the right solution.

Gauss would have loved spreadsheets! Use Excel to see how Gauss developed a formula to sum a number series quickly.

a. Open a blank worksheet.

b. Sum the “slow” way.

   i. Type the Label numbers—one at a time into cell A1. Format Row 1 to wrap text (Format/Alignment).

   ii. Type the value 1 into B1.

   iii. Create a formula and Fill Down to place the values 2–100 into A3:A101, respectively.

   iv. Sum the numbers in cell A102.

c. Derive Gauss’ formula.

   i. Type the Labels numbers, first half into B1 and numbers, second half reversed into C1, and sum of first and second number into D1.
ii. Type the values 1 into B2 and 100 into C2.

iii. Type a formula to sum B2 plus C2 in D2.

iv. Type a formula into B3 to increment by one from B2, and a formula into C3 to decrement by one from C2.

v. Fill D2 into D3.

vi. Fill B3:D3 down through B52:D52.

Can you follow Gauss' logic from here? Pairing the numbers first to last, second to second-to-last, and so on, he noticed that the sum of each pair in the series always equaled one number higher that the highest number in the series, so the sum equaled \((\frac{100}{2}) \times 101\) or 5050.

d. Set up Gauss' formula to sum consecutive numbers from 1 to N (any number).

i. Type the label Consecutive Sum= into G3, Enter, and right justify.

ii. Type the label \((\frac{N}{2})(N+1)\) into H3.

iii. Type the labels N= into G5 and sum= into G6.

iv. Type the value 100 into H5.

v. Type the formula \(= (H5/2) \times (H5+1)\) into H6. The result should be 5050.

e. Use Gauss' formula and your worksheet to quickly calculate the sum of consecutive numbers from 1 to

i. 1,000

ii. 1,462

iii. 45,000

iv. 1 million

If you get a number with an E in it, the number is in scientific or exponential format. Change format to comma with no decimal places so it will look more familiar. Expand your column width as needed.

5. What a difference a day makes.

You have just won the lottery, and you have a choice of two wonderful prizes.

- a million dollars a day for a month (31 days), or
- a penny a day, doubled each day, for a month (one penny the first day, two the second, four the third, and so on).

a. Create a worksheet to help you decide which option to choose.

b. If option 2 were one day longer, would you change your mind?
6. Comparison shop bank accounts.

Just like Tammy, you have $4,000 to invest for up to a year. Find out from local banks or other financial institutions three different ways that you could invest your money. Use your investment rates template and your good sense to determine the wisest investment for you. Word process a brief statement summarizing your findings and explaining your choice.

Review Questions

**Multiple Choice**

1. The five sequential steps to ‘top-down design’ (developing a good spreadsheet) are
   a. test results, outline the solution, develop a step-by-step plan, define the problem, and implementation
   b. define the problem, outline the solution, develop a step-by-step plan, implementation, and test results
   c. implementation, define the problem, outline the solution, test results, and develop a step-by-step plan
   d. develop a step-by-step plan, implementation, define the problem, test results, and outline the solution

2. Cell B3 contains the label Jan 1993. If you drag the fill handle one cell to the right, what will cell C3 contain?
   a. nothing. You didn’t cut and paste.
   b. Jan 1994
   c. Feb 1993
   d. Jan 1993

3. Every formula must begin with a(n)
   a. plus sign
   b. equal sign
   c. minus sign
   d. none of these

4. To ensure the accuracy of your worksheet’s formulas, you should always
   a. use the worksheet immediately
   b. test the worksheet before using it
   c. let your accountant analyze it
   d. depend on the spreadsheet application’s speed for accuracy; that’s its job
5. In a formula, which symbol must precede a column or row reference to make it absolute (unchanging) when the formula is cut, copied, or filled to another worksheet location.

   a. #
   b. @
   c. $
   d. =

**True or False**

1. ___ Spreadsheet analysis is also called "What For?"
2. ___ The spreadsheet is an analytic tool.
3. ___ Use the AutoSum button whenever you add in Excel.
4. ___ Spreadsheets cannot solve your financial problems, but they can help you to visualize new solutions.
5. ___ An incorrect value can result from a typing error as well as a logic error.

---

**Key Terms**

- Absolute reference
- Analysis
- Arithmetic operator
- Best Fit
- Border dialog box
- Decrease font size button
- Equal sign
- Formatting Toolbar
- Goto
- Increase Decimal tool
- Key area
- Key value
- Minus sign
- Panes
- Print area
- Projection
- Score-keeping
- Set Print Area
- Solution outline
- Split box
- Split two-headed arrow
- Testing the worksheet
- Top-down design
- Vertical split box
- What if?
Unit 13 will show you how database applications are used to organize information. By the end of this unit, you will be able to plan, to create, and to use a simple Excel database to keep track of credit card purchases and payments.

**Learning Objectives**

At the completion of this unit you should know

1. what a database is and what you can do with one,
2. the meaning of common database terms: record, field, field name, and file,
3. how to organize and manipulate database information.

At the end of this unit you should be able to:

1. organize and define an area of an Excel worksheet as a database:
   a. create field names,
   b. enter field data into records,
2. insert and delete records,
3. create and use data forms,
4. sort records,
5. extract records that meet certain criteria,
6. summarize data,

7. print reports.

The Database Application

We all keep track of information. We use shoe boxes, notebooks, file drawers, or filing cabinets to hold collections of important cards, lists, or papers. Then, when we need to locate a particular piece of information, we rummage through the pile until we find it. If we have a good organizational system, we can locate things quickly; if we have been disorganized, the search can take a long time. The more information we have, the longer it takes to organize manually and to locate what we need. The computer application called the database automates the organizational and retrieval processes.

A database is an information management system: a collection of related topics, themes, or ideas stored on a computer and arranged for information retrieval and manipulation. The power of a database management system is that it allows the user to:

- collect data (input)
- locate specific information (search, find, or extract)
- rearrange information (sort)
- calculate and summarize information
- generate a variety of reports based on common characteristics (output)

A familiar manual database is the telephone book. The telephone company tracks its customers on a giant computer. Once a year, the telephone company publishes updated telephone books. The White Pages are an alphabetical report of everyone with listed telephone numbers in a given geographical locale; each customer is listed once for each phone line. Every White Page entry follows the same format: name, address, and telephone number. A few entries may be boldface, of larger type. Some entries are unlisted if the customers have paid for this service.

The Yellow Pages are a directory of advertisers, mostly businesses. Advertisers choose the categories where they will be listed and their advertisement format. Therefore, individual businesses may be listed once, several times, or not at all.

Nearly anything that you can organize can form the basis for a database:

- an address book
- a personal collection (recipes, records, tapes, CDs, art, and so on)
- a bibliography or library card catalog
- a set of sales invoices or business contacts
- population statistics (census)
- a bank account or checkbooks
- a calendar

**Macintosh Database Applications**

There are many stand-alone database applications for the Macintosh, including FileMaker Pro, 4th Dimension, Omnis, Double Helix, and Panorama. These databases are very powerful, but require considerable training and experience (and sometimes programming background) to use them effectively. Many integrated applications, including Excel, ClarisWorks, and Microsoft Works, have database modules to create and use simple databases. Using the Excel database, you can learn how a computerized database allows you to put things in order and keep them in order with a minimum of effort.

**Database Terminology**

Suppose you have a company that sells myth insurance to ancient deities. In ancient days, vital statistics on each deity were kept on a scroll, and the whole collection of scrolls was kept in an amphora, a large Greek vase. Over the years, we have modernized. Today, you may keep each business contact information on a three-by-five card, and may keep the cards in a file box. Now, you want to computerize your card collection so that you can locate and organize its information more efficiently. The database version of your file box, represented by a single document icon, is the database file; it is the entire saved collection of information. Each individual three-by-five card becomes a database record, all the information on a particular business contact. Each individual piece of information in the record, such as the contact's name or telephone number, is called a field. Each field has a field name, to help you identify its contents. Every record contains information in each field created, even if that information is a blank.

You can conceptualize a database as an Excel table. The whole table is the file. Across the top of the table (row 1) are the field names, with each record forming a single row and each field a single cell in the table. Figure 13.1 shows how such a table might appear.

**Database Power**

A computerized database is much more than a simple table. When you organize and define worksheet data as a database, you can use special commands to manage your information. You can sort a database to organize some or all of the records into a specific pattern, such as alphabetically by name (see Figure 13.2).

You can search a file to find the records that meet certain, prespecified criteria, such as all the records whose names begin with the letter H. Once you have organized your data according to your specifications, you can create a report: the on-screen or printed list of all the records that match prespecified criteria.
### GUIDED ACTIVITY 13.1

**Using an Excel Database**

Guided Activity 13.1 shows you how to search, sort, add, and delete records from the Business Contacts database file on your Student Data Disk.

1. **Open Business Contacts in the West Student Data folder on your Data Disk.** It will look like Figure 13.1.

2. **Define the database.** Worksheet cells require that data be entered into them before they can be defined as a database. Business Contacts already has field names entered into row 1 and field data into rows 2–11.
   a. **Select the range A1:D12.**

   **NOTE** When you define an Excel database, always include an extra blank row below the last record for additional records.
   b. **Choose Data/Set Database.** Excel names the selected range "Database." Excel only permits one defined database per worksheet.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Name</td>
<td>AKA</td>
<td>Company</td>
</tr>
<tr>
<td>2</td>
<td>Zeus</td>
<td>Jupiter</td>
<td>Olympus Management</td>
</tr>
<tr>
<td>3</td>
<td>Aphrodite</td>
<td>Venus</td>
<td>Hellenic Hostesses, Ltd.</td>
</tr>
<tr>
<td>4</td>
<td>Hera</td>
<td>Juno</td>
<td>Nettle's Metals</td>
</tr>
<tr>
<td>5</td>
<td>Heracles</td>
<td>Hercules</td>
<td>Brown, Inc.</td>
</tr>
<tr>
<td>6</td>
<td>Hermes</td>
<td>Mercury</td>
<td>Quicksilver Messages</td>
</tr>
<tr>
<td>7</td>
<td>Artemis</td>
<td>Diana</td>
<td>Hunt and Hound</td>
</tr>
<tr>
<td>8</td>
<td>Ares</td>
<td>Mars</td>
<td>The Merry Mercenary</td>
</tr>
<tr>
<td>9</td>
<td>Hades</td>
<td>Pluto</td>
<td>Vaulted Images</td>
</tr>
<tr>
<td>10</td>
<td>Dionysus</td>
<td>Bacchus</td>
<td>Wine and Vine</td>
</tr>
<tr>
<td>11</td>
<td>Athena</td>
<td>Minerva</td>
<td>The Owl's Light</td>
</tr>
</tbody>
</table>
3. Enter a new record. Although you can enter field data straight into the worksheet, it is convenient to use the Data Form dialog box to display individual records one at a time.

a. Select cell B1.

b. Choose Data/Form. The Data Form dialog box (see Figure 13.3) will appear, showing the field names and field data for the first record in the database. Excel's form has limitations. It can only display as many fields as will fit in the nonexpandable form window. Scrolling down takes you to the next record, not more fields on the same form.

c. Click New. The record number will display "New Record" and the field data boxes will be blank like those shown in Figure 13.4, with a blinking insertion point in the first field data box, Name.

d. Type Poseidon into the Name field data box and Tab to the next field data box.
e. Type Neptune into the AKA field data box, and [Tab] to the next field data box.

f. Type Trident Aquiculture into the Company field data box and [Tab] to the next field data box.

g. Type 445-9999 into the Phone # field data box.

h. Click Return to add the record to the database, and clear the form for another new record. The message “11 out of 11” may appear briefly as the field data is added to the database part of the worksheet. Then “New Record” reappears in the upper-right corner of the Data Form dialog box.

4. Add two more records to the database and click Close to return to the worksheet.

Record 12: Hephaestus, Vulcan, Explosions R Us, 485-1122

Record 13: Demeter, Ceres, Gaea Granola, 323-8889

5. Locate and edit a record from the data form.

a. Select A2.

b. Choose Data/Form.

c. Click Find Next repeatedly until you reach record 7.

d. Highlight and in the Company field data box and change it to & as shown in Figure 13.5.

![Figure 13.5](edit_field_data)

Company: Hunt and Hound → Hunt & Hound

e. Click Close.

6. Delete Heracles’ record from the database (after all, he’s only a demi-god).

a. Click Data/Form.

b. Click Find Next until you reach record 5.

c. Click Delete. An alert box will warn you that “Displayed record will be deleted permanently.” Neither the restore button nor Edit/Undo will undelete the deleted record.

d. Click OK to delete the record and then click Close.

7. Sort the records alphabetically by name. Excel lets you sort either alphabetically or numerically, depending upon the field data type. *Ascending* means from A to Z or 1 to 100, *Descending* means from Z to A or 100 to 1.

a. Choose File/Save (⌘S). Always save before you sort. That way, if unexpected results occur, you can close the file without saving, and when you reopen it, you restore the file to its presort organization.
b. Drag row headings 2–13 to select rows 2–13 (and records 1–12).
c. Choose Data/Sort to view the Sort dialog box (see Figure 13.6).

![Sort dialog box](image)

$A$2 means that cell A2 is the first cell in the sort. (If you wanted to sort by column B, you would change A to B in the sort dialog box for the First Key.)

d. Check that the settings match Figure 13.6 and click OK. The records should be rearranged in alphabetical order by name.

8. Find the record whose company contains Quicksilver. Excel examines all the records to locate those that contain the text string Quicksilver.

a. Choose Data/Form.
b. Click Criteria. A blank data form will appear.
c. Type Quicksilver into the Company field, and then click Find Next.

Record 10, Hermes, will appear, since Quicksilver is part of Quicksilver Messages.

d. Click Find Next again. The Mac will flash and beep to alert you that there are no more matching records.
e. Close the Data Form.

9. Print a report.

a. Choose File/Page Setup.
b. Deselect the grid lines.
c. Click Header, title your report: Prospective Clients, and close the header.
d. Place your name in the footer instead of the page number (&P).
e. Close the Page Setup window and save your work.
f. Preview the report, adjust as needed, and print the report.
g. Preview the report and make aesthetic adjustments.
h. Print the Excel database like any other worksheet.
The business contact database is rather whimsical. But now that you understand database mechanics, you can apply this knowledge to develop and use a more practical file.

Think of a database as a special kind of spreadsheet that manipulates information. Just like the spreadsheet, the database requires careful planning to avoid the dreaded computer result GIGO—garbage in/garbage out. Large databases may require hundreds of hours of organization prior to data entry and many thousands of hours entering information. (If you were planning a large, complicated database, you would most likely be using a stand-alone database management application rather than Excel.)

To plan a database, you must decide what information you want to receive from the database (output) and what information you should enter (input) to get the desired results. Planning determines which fields to use and what kind of data they will contain (the field types). The database development process resembles spreadsheet development. Now, apply the process to create and use an Excel database to keep track of credit card activity.

**Defining the Problem**

Many people have trouble with credit cards. You are in the store and see a shirt that you must buy. Out comes the plastic! Unlike a checkbook, most people lack a central place to record and tally charge purchases. Consequently, the bill at the end of the month can bring unpleasant financial surprises. The more credit cards you have, the more potential surprises. There goes the budget! Likewise, at year end you may have difficulty isolating deductible items when you prepare your taxes. Therefore, the problem is: how to organize credit card purchases and payments to know how much has been spent, on what, and how much is owed on each card?

A simple credit card database will let you know how much you owe at any point in the month on either individual or collective cards, and allow you to print itemized reports for each expense category.

**Outlining the Solution**

What do you need to know to solve the problem? To keep track of credit card activity, you might outline your solution as follows:

I. What data do you need for each purchase or payment?

II. What kinds of summary reports do you want to view or print?
Developing a Step-by-Step Plan

Here, you expand the solution outline into smaller parts. You determine which fields to use and what kind of data each field will hold.

I. What data do you need for each purchase, return, or payment?
   a. Date
   b. Credit card
   c. What was purchased
   d. Cost
   e. Category
   f. Comments

II. What kinds of summary reports do you want to view or print?
   a. Total amount due
   b. Amount due on individual cards
   c. Amount spent by category for specified time periods

Implementation

Now that you know the data you need and how to organize it, you are ready to create the file.

Guided Activity 13.2

Building a Database File

Guided Activity 13.2 shows you how to create a database file to organize your credit card activity. You will test and use the database in subsequent Guided Activities. Begin at the Desktop.

1. Open Excel to display a blank worksheet.
2. Enter the field names in row 1 as shown in Figure 13.7.
3. Select and bold row 1.
4. Enter the sample data shown in Figure 13.8 directly into the worksheet cells. Remember to [Tab] from cell to cell horizontally left to right. Use the left and down arrow keys to return to column A to start a new record.
5. Save the file to your disk as Credit Card DB.

6. Define the database.
   a. Select the range A1:F7 to include the extra blank row for additional records.
   b. Choose Data/Set Database.

7. Use the Data Form window to add the records shown in Table 13.1 to the database.

<table>
<thead>
<tr>
<th>DATE</th>
<th>CREDIT CARD</th>
<th>AMOUNT</th>
<th>WHERE</th>
<th>CATEGORY</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-Apr</td>
<td>MasterCard</td>
<td>12.63</td>
<td>Office Club</td>
<td>Office supplies</td>
<td></td>
</tr>
<tr>
<td>10-Apr</td>
<td>MasterCard</td>
<td>6.92</td>
<td>Longs</td>
<td>Medical</td>
<td></td>
</tr>
<tr>
<td>11-Apr</td>
<td>Discover</td>
<td>16.45</td>
<td>Ultamar</td>
<td>Auto</td>
<td></td>
</tr>
<tr>
<td>12-Apr</td>
<td>MasterCard</td>
<td>912</td>
<td>UC Berkeley</td>
<td>Education</td>
<td>Tuition, summer school</td>
</tr>
<tr>
<td>15-Apr</td>
<td>Discover</td>
<td>-100</td>
<td></td>
<td>Payment</td>
<td></td>
</tr>
</tbody>
</table>

   a. Choose Data/Form.
   b. Click New and type in the first new record, pressing Tab to move from field to field.
   c. Press New again and enter the second new record.
   d. Adapt step 7c. until all the records in Table 13.1 are added to your file.
   e. Click Close to return to the worksheet.

To indicate a payment (or a return), place a minus sign (−) before the amount.

8. Create a formula to calculate the amount owed. Databases can use formulas and functions just like spreadsheets.
   b. Click the AutoSum button.
   c. Verify that the formula bar reads =SUM(C2:C12) and press [Enter].

9. Format column C for currency, two decimal places using the style list on the Toolbar.
a. Select column C.

b. Press the down arrow to the right of Normal on the Toolbar to display the drop-down number styles menu (see Figure 13.9).

c. Choose Currency.

10. Type and right justify the label TOTAL: into B13

11. Save.

12. If desired, print the database.

Test Results

Verify your calculation by hand or with a calculator.

Your credit card database is now ready for use. However, before you proceed, there are a few data entry cautions.

BE ACCURATE

If you type the amount of $4.01 instead of $40.10, Excel will not know that the amount is wrong and will use $4.01 in all relevant calculations. If you ask Excel to find all the charges to your Discover card, and you have one or more records where the word “Discover” is misspelled, Excel will not locate them with the Find command. Therefore, when you extract all the Discover charges in the next Guided Activity, the unlocated charges will not be tallied in your Discover card subtotal.

BE CONSISTENT

The computer is a machine. It doesn’t know that “medical expenses” and “health expenses” are the same thing, so it can’t lump them together. To encourage consistency, make yourself two master lists, one of your credit cards and one of the categories you plan to use. Keep the lists near the computer, and refer to them when you enter credit card data.

Using the Database

The purpose of a database is to manipulate information. You already have sorted records and found records based on specific criteria. Another useful manipulation technique is called extraction. To extract records, you isolate the records that
match your criteria and copy them to another area of the worksheet called the *extract range* for further use. Extraction is a three-step process: define the criteria, define the extract range, and initiate the extraction.

**GUIDED ACTIVITY 13.3**

*Extracting Data to Create Reports*

Guided Activity 13.3 continues from Guided Activity 13.2 with Credit Card DB open. You will learn to work with a group of records that meet certain criteria, extract them from the database, and use them to calculate and print a report.

1. Extract the Discover card records.
   a. Define the extraction criterion Credit Card = Discover.
      i. Locate a group of empty cells on the worksheet, such as A15:A16.
      ii. Type the field name Credit Card into cell A15.
      iii. Type the extraction criterion Discover into cell A16.
      iv. Select the cells containing the criteria (A15:A16).
   b. Define the extract range.
      i. Locate a group of empty cells with enough rows for all the records you want to extract and enough columns for all the information you want to display, such as the group beginning with row 18. When you extract data, you can choose the records to display, and also specify the fields you want to display.
      ii. Type the names of the fields you wish to display into the top row of the group. Type Date into A18, Credit Card into B18, and Amount into C18.
      iii. Select the field names you have typed and enough cells directly below them to hold all the records you wish to extract (A18:C28 in this case).
   c. Extract the data.
      i. Choose Data/Extract
      ii. Click OK in the Extract dialog box. The *extracted data* will appear in the extract range, filling as much of the range as required (Figure 13.10).
2. Sum the Discover card activity in cell C25.

3. Print a Discover card report.
   a. Select the range A18:C25.
   b. Align right.
   c. Choose Options/Set Print Area to print only the selected range. This command specifies the cells to print, so that you don't print the entire worksheet.
   d. Use Page Setup to turn off cell gridlines, center the report on the page, and place the phrase Discover Card Activity for April into the header.
   e. Save the file and Print the Report.
   f. Select the whole worksheet (Figure 12.4) and choose Options/Remove Print Area. Remember, you can only use this command when the entire worksheet is selected.

4. Adapt steps 1–3 to create and print a MasterCard report.

5. Adapt steps 1–3 to create and print a Food expense report.

6. Quit Excel.

**FileMaker Pro**

As a record holding, extracting, and arranging system, the Excel database module works fine—provided that you only need to find, to sort, or to reorder your information occasionally, or in a limited variety of ways. If, however, you find yourself performing many different sorts and extractions, you will probably find Excel both cumbersome and limited. Under these circumstances, consider a dedicated or stand-alone database application.

A database application is a record holding and organizational system. Each database application uses the same data organization principles as Excel: defining fields, placing record data into fields, manipulating the data in various ways, and publishing reports. Database applications permit more sophisticated data entry and manipulation than Excel, but with a price—stand-alone databases require considerable knowledge and experience to set up and use effectively. To provide the tenor or feel of a stand-alone database, without teaching you all the specifics
needed to actually use it, let us examine how FileMaker Pro, the most widely used Macintosh database application, might track credit card usage.

To create a FileMaker Pro credit card database, your first step would be to create a new file, complete with name and storage location (see Figure 13.11). Once you create the file, FileMaker Pro automatically saves your work, so you don’t have to save it. After you create a file, you define fields, design forms to hold and display the fields, enter data, find and sort records, and produce reports.

**Defining Fields**

Before you can enter data, you must set up fields to hold (structure) the specific pieces of data. When you click the New button in Figure 13.11, FileMaker Pro automatically displays the Define Fields dialog box shown in Figure 13.12. This dialog box allows you to give each field a unique name (*field name*), and to predetermine the kind of data (*field type*) that will go into that field. If you were actually defining a field, you would type its name into the Name box (“Comments” in Figure 13.12), click the radio button next to the desired field type (Text), and then click the Create button.
FIELD TYPES

FileMaker Pro permits seven types of fields. The field type you choose depends on how you plan to manipulate the field’s data after you enter it.

**Text fields** store anything you can type, up to 64,000 characters. Text fields typically hold names and addresses, descriptions, comments, and so on. Text field data can be sorted alphanumerically (A–Z), and can be used in certain calculations and summaries, such as counting the number of records in the file. Alphanumeric sorting is explained more thoroughly in Unit 14.

**Number fields** store anything you type, up to 255 characters, all on one line. Number field data can be sorted numerically (such as 1–100), with FileMaker Pro ignoring any text in the field. Like the spreadsheet, the number field values can be used in formulas and allow for a wide range of calculations.

**Date fields** are a special kind of number field, each storing a single month, day, and year. You might create and use a date field to record when a transaction occurred. Later, you could sort transactions by chronological order.

**Time fields** are similar to date fields, each holding a specific time in hours, minutes, and/or seconds.

**Picture/Sound fields** can store only pictures, sounds, or QuickTime movies.

**Calculation fields** contain formulas that take data from other fields and manipulate them. Calculation fields can use values in text, number, date, time, or other calculation fields. Calculation fields are user-defined, much like the formulas that you can place into spreadsheet cells.

**Summary fields** compute a value for a field over a group of records using one of seven predefined formulas: Total, Average, Count, Minimum, Maximum, Standard Deviation, or Fraction of Total.

ENTRY OPTIONS

Once a field is defined, that field can receive *entry options* that either automatically enter data into the field or manually check entered data for consistency. Before you give a field entry options, you would view the field-type-specific choices available in its Entry Options dialog box. In Figure 13.13, the number field Amount is set so that the user will be warned if the field is left blank (not empty), or data other than a number is typed into the field. The process of controlling data for accuracy is also called *verification*.

Another valuable feature of FileMaker Pro is its ability to establish *predefined value lists*, such as the one shown in Figure 13.14. Such a list restricts a given field’s entries to that list. This permits rapid data entry as well as data consistency, and it prevents the user from entering “Discover” in the Credit Card field of one record, and “Discover Card” for another.

**Designing and Using Layouts**

Unlike Excel, which allows you to view your data in one of two ways (table and form), FileMaker Pro lets you design or choose virtually any custom form and list you need. Each of these is called a *layout*. FileMaker Pro layouts are made within
the special layout mode shown in Figure 13.15. The status area, found on the left side of the screen, contains controls and tools to create and manipulate layout items. Several of the tools resemble MS Word's Draw tools, and they serve the same functions. The Layout itself can display horizontal and vertical ruler guides and gridlines to help you position layout objects.

Figure 13.16 shows the completed custom layout, created with FileMaker Pro's drawing tools and clip art. It is an entry layout, a starting place from which to use the custom Credit Card Tracking database.

Each of the shaded ovals is actually a button, a custom-made, on-screen clickable command.

Here, a click of the Purchases button has been programmed to display the Purchases form (see Figure 13.17) where you can enter and edit purchase transactions.

Once data is entered, a variety of custom reports can be displayed and printed. Although each custom layout can be time-consuming to construct, once it is made it can be chosen easily from the layout pop-up menu (see Figure 13.18).

Figures 13.19–13.21 show three examples of credit card reports. The first report is organized to show each credit card's activity; the second report organizes expenditures by category; and the third report summarizes categorical expenses.
Finding and Sorting Records

The power of the computerized database lies in its ability to locate (extract) rapidly just the records you want, organize them into a specified order, and print the desired report. For example, suppose you wanted to print a report showing how
much money you charged on food in the first week of April 1993. Here are the steps you would take.

First, you would set search criteria in the appropriate layout, such as Date before 4/9/93 (no data was entered before April 1, 1993) and Category of Food in Figure 13.22, and then you would find the matching records.

Second, you would choose the layout in which to report your data.

Third, you would sort the data chronologically in the Sort dialog box (see Figure 13.23).

Fourth, you would preview and print the report shown in Figure 13.24. It uses the same layout as Figure 13.20.
**FIGURE 13.20**
Custom report, monthly activity by expense category (this report has a smaller type size than Figure 13.19)

**Spending by Category**

<table>
<thead>
<tr>
<th>Date</th>
<th>Category</th>
<th>Comments</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/12/93</td>
<td>Automobile</td>
<td></td>
<td>21.00</td>
</tr>
<tr>
<td>4/11/93</td>
<td>Automobile</td>
<td></td>
<td>16.45</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$37.45</strong></td>
</tr>
<tr>
<td>1/4/93</td>
<td>Books</td>
<td>computer book</td>
<td>29.60</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$29.60</strong></td>
</tr>
<tr>
<td>4/2/93</td>
<td>Clothing</td>
<td>shoes</td>
<td>56.91</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$56.91</strong></td>
</tr>
<tr>
<td>4/12/93</td>
<td>Education</td>
<td>tuition, summerschool</td>
<td>912.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$912.00</strong></td>
</tr>
<tr>
<td>4/11/93</td>
<td>Food</td>
<td></td>
<td>23.87</td>
</tr>
<tr>
<td>4/2/93</td>
<td>Food</td>
<td></td>
<td>45.23</td>
</tr>
<tr>
<td>4/11/93</td>
<td>Food</td>
<td></td>
<td>28.42</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$97.52</strong></td>
</tr>
<tr>
<td>4/10/93</td>
<td>Medical/Dental</td>
<td></td>
<td>6.92</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$6.92</strong></td>
</tr>
<tr>
<td>4/6/93</td>
<td>Office Supplies</td>
<td></td>
<td>12.63</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>$12.63</strong></td>
</tr>
<tr>
<td>4/15/93</td>
<td>PAYMENT</td>
<td>partial</td>
<td>-100.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>-$100.00</strong></td>
</tr>
</tbody>
</table>

**Total Outstanding**: **$1053.03**

**FIGURE 13.21**
Custom report, summary expense report

**Spending by Category**

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automobile</td>
<td><strong>$37.45</strong></td>
</tr>
<tr>
<td>Books</td>
<td><strong>$29.60</strong></td>
</tr>
<tr>
<td>Clothing</td>
<td><strong>$56.91</strong></td>
</tr>
<tr>
<td>Education</td>
<td><strong>$912.00</strong></td>
</tr>
<tr>
<td>Food</td>
<td><strong>$97.52</strong></td>
</tr>
<tr>
<td>Medical/Dental</td>
<td><strong>$6.92</strong></td>
</tr>
<tr>
<td>Office Supplies</td>
<td><strong>$12.63</strong></td>
</tr>
<tr>
<td>PAYMENT</td>
<td><strong>-$100.00</strong></td>
</tr>
</tbody>
</table>

**Total Outstanding**: **$1053.03**

**FIGURE 13.22**
Set search criteria in the Find window
Automation

Not only does FileMaker Pro perform each of the preceding functions quickly and easily, it also lets you create scripts and buttons to automate many database tasks that would otherwise be tedious or problematic.

SCRIPTS

A script is a command that instigates a sequence of commands. If the report shown in Figure 13.24, for example, were one that you used on a regular basis, you could create a script. Then, with a single menu choice or keystroke combination, FileMaker Pro would fill in the search criteria automatically, find the matching records, order them chronologically, choose the designated layout, and print the report. Figure 13.25 shows the Script Definition dialog box that could establish these steps.

BUTTONS

Buttons are layout objects that initiate a script when clicked. FileMaker Pro is shipped with a series of database templates, sample files that can be used as they are or modified to meet individual needs. One such template, the Contact Manager, uses buttons to demonstrate both FileMaker Pro’s power and its ease of use. The Contact Manager opens to Figure 13.26.

The neatly arranged row of buttons at the bottom of the layout provide many command choices. To print mailing labels, you would click the Labels button. The
FIGURE 13.25
The Script Definition dialog box

FIGURE 13.26
The Contact Manager

The next layout, Figure 13.27, provides both on-screen instructions and more button choices.

If you were to click the Continue button, another layout would appear, Figure 13.28, with more choices.

Here you would load mailing labels into your printer, click the button of your label number, and print your labels, previewed in Figure 13.29.

If, on the other hand, you decided not to print labels at this time, you could always click the Exit button to quit FileMaker Pro.
To print labels for the names listed below, click Continue. If this list is incorrect, click Find to locate the correct set of names.

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Name</th>
<th>Contact Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACME Accessories</td>
<td>Dennis Smith</td>
<td>Marketing Associate</td>
</tr>
<tr>
<td>Davis &amp; Davis Reprographic</td>
<td>Michael St. Lorant</td>
<td>Director of Marketing</td>
</tr>
<tr>
<td>Norris Corporation</td>
<td>Sonia Long</td>
<td>Buyer</td>
</tr>
<tr>
<td>PrintCo.</td>
<td>Jennifer Norriz</td>
<td>Sales Manager</td>
</tr>
<tr>
<td>Smith &amp; Waterman Assoc.</td>
<td>Julie Davidson</td>
<td>Marketing Administrator</td>
</tr>
<tr>
<td>Smith's More Corp.</td>
<td>Jeremy Smith</td>
<td>President</td>
</tr>
<tr>
<td>The Framery</td>
<td>John Winford</td>
<td>Personnel Administrator</td>
</tr>
<tr>
<td>West End Corp.</td>
<td>Pamela Day</td>
<td>Promotions Assistant</td>
</tr>
</tbody>
</table>

October 31, 1993

---

**FIGURE 13.28**
Push a button to choose a label

Select an Avery label to print:
Summary

Unit 13 has introduced you to the database application. You have learned the basics of database organization: a collection of information is a file; all the information about a particular person, place, or thing is a record; and each informational category is called a field and is identified by its field name. In Excel, you can either enter and edit data in records as if each field were a spreadsheet cell, or you can work in a special database form window.

Successful database development follows the same guidelines as spreadsheet development; the better the planning, the more useful the database. Once you have defined your database and entered data, you can manipulate that data in many ways. You can sort all or part of the database on up to three fields. You can find records that match specific criteria and view them one at a time. You can extract a portion of the database’s information and place it in a separate area of your worksheet. Once extracted, you can edit, format, perform calculations on, and print the extracted information.

The last part of Unit 13 acquainted you with many aspects of the predominant Macintosh database application, FileMaker Pro. You saw how the generalized functions of a database application—order, enter, manipulate, and report—can be sophisticated and refined compared to Excel, permitting better data control and display. At the same time, you learned why database applications required considerable planning and implementation time to function satisfactorily.

Command Review

Define a Database

Select the database range in the Excel worksheet and then choose Data/Set Database. This permits the selected range to perform database operations.
NOTE  Each Excel worksheet may only have one defined database range.

Enter a New Record  Select a cell in the database range and then choose Data/Form to open the Data Form dialog box. Click New to clear the form for a new entry. Type in your field data, pressing Tab to move from field to field and Return to add the field to the database and provide a blank form for the next new record.

Delete a Record  Display the record in the form window and then click Delete. This permanently removes the record from the database and is not Undo-able.

Sort Records  Choose Data/Sort, set your sort criteria, and then click OK. This arranges records in the order specified.

Find a Record or Records  Choose Data/Form, click Criteria to see the criteria form, type your criteria into the appropriate field boxes, and click Find Next. Continue to click Find Next until the Mac beeps and flashes to indicate there are no more matching records. Excel will display the records that match your criteria one at a time.

Extract Data  Define extraction criteria, define the extract range, and choose Data/Set Extract. This places the specified records and field data into the extract range.

**Exercises**

1.  Checkbook register  

   In Exercise 12.3, you made a checkbook register worksheet.
   
   a.  Establish the relevant cells as a database, and add another month’s activity with the form.
   
   b.  Extract activity for three different categories (you decide which activities), printing a report of each.

2.  Address book  

   Develop a database of your family, friends, or business contacts. Here is a list of fields you might use:
   
   Last Name  
   First Name  
   Address  
   City
State
Zip
Area Code
Phone Number

a. Enter data for at least twelve people.

b. Alphabetize the records and print a report.

c. Extract everyone who has the same zip code as you, and print a second report.

3. The collection

Nearly everyone collects something: dolls, baseball cards, books, videotapes, compact disks, coins, stamps, and so on. An Excel database can help you to keep track of your collection.

a. Plan a simple database with no more than seven fields.

b. Type your field names into an Excel worksheet, define as a database, and add at least 12 records.

c. Sort the records in a meaningful fashion and print a report.

d. Extract records that meet your criteria, and print a second report.

Review Questions

Multiple Choice

1. A database is

a. an information management system

b. a collection (of topics, of themes, of people)

c. an organizational system

d. all of these

2. When you extract data, the database searches the fields for the records that match the given

a. criteria

b. explanation

c. identity

d. table
3. When the database locates all of the records whose field data match the given criteria, it generates a list. In database terminology, this list of records is called a
   a. table
   b. form
   c. report
   d. range

4. How many databases does Excel allow per spreadsheet?
   a. 1
   b. 2
   c. 3
   d. 4

5. In a dedicated database such as FileMaker Pro, birth dates are usually put into a
   a. text field
   b. number field
   c. date field
   d. time field

True or False

1. ___ An example of a common manual database is the telephone book.
2. ___ Excel is a stand-alone database application.
3. ___ The form view offers an unlimited view of all records.
4. ___ New records cannot be added once the database has been created.
5. ___ Databases require little preparation.

Fill In the Blanks

1. List three types of businesses that currently use databases.
   a. __________________ b. __________________ c. __________________

2. For the businesses that you named, identify three field names that each uses.
   a. __________________ b. __________________ c. __________________
   a. __________________ b. __________________ c. __________________
   a. __________________ b. __________________ c. __________________
3. For one of the businesses that you named, give an example of the type of report that would be used.

4. To generate the report named in #3, list two search criteria.

---

**Key Terms**

- Ascending
- Button
- Calculation fields
- Database
- Date fields
- Descending
- Entry layout
- Entry options
- Extract range
- Extracted data
- Extraction

- Field
- Field name
- Field type
- File
- FileMaker Pro
- GIGO
- Layout
- Number fields
- Number styles menu
- Picture/sound fields
- Predefined value lists

- Record
- Report
- Script
- Search
- Sort
- Status area
- Summary fields
- Text fields
- Time fields
- Verification
You have now used a variety of Macintosh applications to complete several tasks; concurrently, you have stored a number of files. The more files you create, the more crowded and confusing your Desktop can become, and the more time you can waste locating a specific file or navigating from one file to another. Unit 14 shows you how to organize your files, how to create selective backups of essential files, how to navigate among open applications, and how to prevent unwanted virus files from invading your computer.

**NOTE** You will need a blank floppy disk to complete Guided Activity 14.8.

**Learning Objectives**

At the completion of this unit you should know

1. why icons and windows should be organized,
2. the purpose, creation, and use of folders,
3. that the Hierarchical File System (HFS) permits icon organization,
4. the guidelines for effective filing,
5. the purpose of a selective backup,
6. the uses and dangers of the Trash,
7. the purpose and function of the Path menu,
8. how files get misplaced and how to find them,
9. how RAM is allocated among open allocations,
UNIT 14 MACINTOSH MANAGEMENT

10. the memory distinction between closing a document and quitting an application,
11. what computer viruses are, how to detect them, and ways to prevent them from infecting your system.

At the completion of this unit you should be able to
1. create and name folders,
2. duplicate files and folders,
3. select multiple icons with marquee and [Shift]-click techniques,
4. reorganize files and folders,
5. evaluate and diagram a disk's file organization,
6. place icons in the Trash and empty the Trash,
7. use the Path menu to navigate the Hierarchical File System both at the Desktop and within other applications,
8. locate lost files with File/Find,
9. selectively back up individual files and folders to a floppy disk,
10. measure your system's total RAM and the memory used by each open application,
11. use the application menu to navigate among open applications.

The Need for Desktop Organization

Nearly everyone has had the misfortune of trying to work at a messy desk. With folders and papers piled from one end of the desk to the other, it is difficult to locate what you need or to find a clean place to work. The Macintosh's vertical Desktop confines your office workspace to an area that may be smaller than half a square foot (with a small monitor). This limited workspace makes it essential to keep your Desktop neat and organized so that you can work efficiently. If you do not organize with care—and put things away when you are finished with them—your screen will sprout icons on top of icons, like the Chaos folder shown in Figure 14.1, or the windows upon windows shown in Figure 14.2.

Figures 14.1 and 14.2 could be viewed as conservative examples of a messy Desktop. Remember that hundreds of small files can fit on a floppy disk, thousands of files on a hard disk, and scores of windows can be open on the Desktop. Imagine the Chaos folder with 100 icons rather than its current 28. Consider trying to locate a window if there were 60 open, instead of the six shown in Figure 14.2. Guided Activities have spared you the confusion of a messy Desktop. Unit 14 leads you...
through the principles of Desktop organization so that you can continue to keep your icons and windows ordered. Begin by creating a working copy of the files that you will reorganize.

**Icon Duplication**

There are many times when you may require more than one copy of a file on the same disk: the original for preservation and the other(s) for modification.

**File Duplication**

Remember how you created an exact replica of the *First Try* document (Guided Activity 5.1) by highlighting the original icon and then choosing the Finder command, File/Duplicate? This command *duplicates* the original file, with the duplicate's icon appearing just below and to the right of the original file's icon, as shown in Figure 14.3. The Finder prevents you from placing two icons with exactly the same name within the same folder. Duplicate icons have the word *copy* after the original name. Additional duplicate icons are named *copy 2, copy 3*, and so on.
Folder Duplication

You may not think much of file duplication. After all, you already know how to open a document and choose File/Save As to replicate and rename it. But Save As only duplicates individual files. In contrast, when you duplicate a folder you simultaneously duplicate all the files it contains and preserve the window(s) of the duplicate folder in the same icon positions as the original.

CHAOS INTO COSMOS

The folder that you will duplicate is named Chaos. Chaos is a Greek word. According to Greek mythology, before there was order in the universe, there was nothing but chaos—confusion and disorder. Figure 14.1 shows the Chaos window—definite Desktop disorder. The Chaos folder contains 28 code-named files. Following the Greek theme, files 1-12 Th and about Th describe the twelve labors of Hercules, and files 1-7 wow and about wow describe the seven wonders of the ancient world, many of which were Greek or created according to Greek standards of beauty. The remaining files, 1-6 h8 and about h8, discuss the wives of King Henry VIII of England.

Cosmos is another Greek word meaning harmony, order, or organization. Through the next several guided activities, you will organize your duplicate folder to make it orderly.

GUIDED ACTIVITY 14.1

Duplicating and Renaming the Chaos Folder

Guided Activity 14.1 shows you how to duplicate the Chaos folder in the West Student Data folder on your Data Disk. You will highlight the folder icon, duplicate it, monitor the duplication process, rename the duplicate folder Cosmos, and compare the contents of the original and duplicate folders. You will organize Cosmos in subsequent Guided Activities. Begin at the Desktop.

1. Insert and open your unlocked Data Disk.

2. Open the West Student Data folder to view its window.

3. Locate and duplicate the Chaos folder:
   a. Drag the Chaos folder to a blank part of the window.
   b. Click the closed Chaos icon to select it.
   c. Choose File/Duplicate (⌘D) to place an exact replica of the Chaos folder onto your Data Disk. As the folder's contents duplicate, the Copy dialog box appears to let you monitor the progress (see Figure 14.4). The box displays the number of icons that remain to be copied, and the name of the icon currently being read or written.
The Finder assumes that you will rename the duplicate icon so it appears on the Desktop with its name already selected.

4. Rename the duplicate folder Cosmos and drag it to the right of Chaos.

5. Verify the relationship between the original and the duplicate folder. When comparing windows, view their contents by Name. This alphabetical arrangement facilitates contents comparison, and prevents icons from overlapping.
   a. Open Chaos. Observe the window’s size, location, and icon layout. What a mess!
   b. Open Cosmos. It opens exactly on top of Chaos. Another mess!
   c. Close Cosmos.
   d. The Chaos folder is still open, but it is underneath the West Student Data folder. Double-click the grayed Chaos folder icon to activate its window and to bring it forward.
   e. Choose View/by Name to display Chaos items in alphabetical order. Now the icons are distinguishable.
   f. Use Figure 14.5 as a guide to resize the Chaos window and to move it to the upper-left corner of your screen.
   g. Open, View/by Name, and resize the Cosmos window. Move it to the upper-right corner of your screen. The Chaos window is now in back of the West Student Data window.
   h. Double-click the Chaos folder icon to bring its open window forward.
   i. Drag the Cosmos window into position besides the Chaos window. Adjust window sizes as necessary to make your screen resemble the one in Figure 14.5.
   j. Scroll the folder windows to compare their contents. They are identical. Duplicate folders do not require the word copy after each duplicate icon name since the originals and their duplicates are in different windows.

6. Close all open windows, but leave the Data Disk inserted in the disk drive for the next Guided Activity when you will create and use folders.
Folders Permit Organization

Folders structure your Macintosh work environment. Just as you create data files in other applications, you can use the Finder—whose primary role is to manage your disks and files—to create and to name folders. You simply drag icons inside the folders to “file” them away. You can create as many folders as you wish (within the memory limits of your computer), name them, and put applications, files, and even other folders inside them.

Before a folder can be created, the Finder must know where to place it. The place where a new folder will appear, either on the Desktop workspace or inside an open window, is the folder’s destination. Following the basic rule of Macintosh computing—select, then act—you set the folder’s destination by selection. When you activate a window, you select it to receive a new folder; if no window is active, the Finder places the new folder on the Desktop workspace. The Desktop command File/New Folder ([⌘][N]) creates a new folder in the destination you have set. The new folder appears with its default name, untitled folder, selected and ready for modification.

Rename an untitled folder with organization in mind. Use a descriptive or categorical name, such as Personal Letters or 1993 Budgets, rather than a cryptic, soon forgotten name, like My Work or Folder 2. Each folder name can use up to 32 characters.

To place an item inside a closed folder, drag the item over the folder icon and release the mouse button. The folder icon highlights when you reach the correct filing position. To move an item from one window to another, drag it to its new location.
Guided Activity 14.2  
Creating and Using a New Folder

Guided Activity 14.2 shows you how to create and rename a new folder in your Data Disk window and how to place a document inside it. Begin at the Desktop.

1. Open the Data Disk window. It is the active window.
3. Rename the folder word processing.
4. Open the word processing folder. Its window is empty (0 items) because you haven't put anything in it yet (see Figure 14.6).
5. Close the word processing window.
6. Duplicate First Try.
7. Drag the First Try Copy icon over the closed word processing folder icon and release the mouse button to file First Try Copy into the word processing folder.
8. Open the word processing window to see First Try copy inside (see Figure 14.7).

Folder Problems

It's easy to locate, to create, to name, and to use folders—as long as you follow all the steps carefully and logically. Unfortunately, it is also easy to forget or reverse a step. Then, the folder goes somewhere unexpected or keeps the name untitled folder. The next Guided Activity demonstrates common folder problems, reverses them, and makes suggestions for preventing these problems.
Guided Activity 14.3 continues from Guided Activity 14.2. You will make some mistakes in placing and naming folders, correct the mistakes, and analyze why they occurred to avoid repeating them. Your Data Disk should be inserted.

**Problem 1: The Folder Won’t Go Where I Tell It.**

1. The folder appears on the Desktop workspace.
   - a. **Option**-click the active window’s close box to close all windows.
   - b. Click the Data Disk icon to highlight it.
   - c. Choose File/New Folder (⌘N). The untitled folder appears on the Desktop workspace, not inside the Data Disk window. This happened because a folder can only be created in an open, active window, or on the Desktop workspace.
   - d. Remedy: drag the untitled folder onto the closed disk icon to place it inside.

2. Create a folder within a folder. Goal: to place a folder inside the Cosmos folder.
   - a. Open the Data Disk window and the West Student Data folder window.
   - b. Click the Cosmos folder icon to highlight it (not open it).
   - c. Choose File/New Folder (⌘N). The untitled folder appears in the West Student Data window, not inside the Cosmos window. This happens because a folder can only be created in an open, active window, or on the Desktop.
   - d. Remedy: drag the untitled folder onto the closed Cosmos icon to place it inside.

**Problem 2: My Folders End Up Untitled.**

1. Click the Data Disk window to activate it.
2. Choose File/New Folder (⌘N).
3. Click next to the untitled folder icon to deselect it. When you deselect an icon, you register its name.
4. Remedy: click the untitled folder’s name to reselect it, type in the new name, and click next to it again to register the new name.
The Organizational Process

Now that you know how to create and name folders and to move items in and out of them, you are ready to bring order to the “complete Desktop disaster” inside the Cosmos folder. Using a Guided Activity makes it easy to understand how folders facilitate file organization.

**GUIDED ACTIVITY 14.4**

*Bringing Cosmos to Chaos*

Guided Activity 14.4 shows you how to create and use folders to group related files together inside the Cosmos window. Begin at the Desktop with your unlocked Data Disk inserted.

1. **Prepare the Cosmos window.**
   a. Locate and open the Cosmos window.
   b. Choose View / by Icon to display each item by its full-size or large icon.
      
      The Cosmos window is very chaotic. Although the window’s information bar reports that there are 28 items inside the folder, it’s hard to tell what’s actually there since files and folders are on top of each other.
   c. Drag the size box to the right to widen the window to the width of your screen.

2. **Separate the Cosmos icons and optimize the window’s organization.**
   a. Drag a few of the icons apart.
   b. Dragging individual icons takes a long time. Let the Macintosh do it for you! Press [Option] and choose Special / Clean Up by Name to arrange the folder’s icons in alphabetical order on an invisible grid.
   c. Zoom the Cosmos window to optimal size. Depending on the size of your monitor, your window size and icon arrangement might differ from the one shown in Figure 14.8.

3. **Create organizational folders.**
   a. Be sure the Cosmos window is active (it should have stripes in its title bar). If not, click the window to activate it.
   b. Choose File / New Folder (⌘ N) and name the new folder labors.
c. Create two more folders named wonders and wives. Your screen should look like the one shown in Figure 14.9.

4. Place files into folders.
   a. Drag 7 wow into the wonders folder. It takes a long time to move the files individually.
   b. Shift-click to select and simultaneously drag the rest of the wow files into the wonders folder.
      i. Click 1 wow to highlight it.
      ii. Press Shift and keep it pressed.
      iii. Click 2 wow. It also highlights.
      iv. Click each of the remaining wow files in turn until they are all highlighted.
      v. Release Shift and the mouse button. The icons stay highlighted.
      vi. Roll the mouse pointer over the graphic of the selected icon closest to the wonders folder, 6 wow in Figure 14.8.
      vii. Drag the closest icon over the wonders folder icon, as if you were filing a single item. The outlines of all the selected icons will move, although only one of them will be directly over the wonders folder. As you can see from Figure 14.10, some icon outlines might even move off the window.
viii. Release the mouse button. All the selected icons are filed. (Open and close the wonders folder to verify if you like.)

c. Adapt step b. to drag all h files into the labors folder simultaneously.

d. Use selection marquee to highlight and to move all the h8 files into the wives folder, such as in Figure 14.11. The marquee technique that you used to select neighboring objects in the MS Word Picture window is the fastest way to select a group of icons that are near each other.

i. Drag about h8 up so that it is to the left of 6 h8.

ii. Place the pointer to the top and left of 1 h8. Be sure the tip of the pointer is not over the icon itself, or you will select and drag the icon.

iii. Drag diagonally down and right to create and to expand the marquee. As the marquee expands, it highlights each icon it touches.

iv. Expand the marquee to select all the h8 icons.

NOTE If you accidentally select the folders, release the mouse and click on a blank space in the window to deselect all icons. Begin again.

v. Release the mouse button. The marquee will vanish, but the icons will remain highlighted.

vi. Drag the closest icon over the wives folder icon and release to file all the h8 files simultaneously. All the files in the Cosmos folder should be filed away into one of three folders. Now you have order!
5. Place folders into folders, or nest folders.
   a. Create a new folder in the Cosmos folder and name it ancient world.
   b. Drag the labors and wonders folders inside the ancient world folder.
      Here’s an alternate selection technique.
      i. Draw a selection marquee to select the wonders, wives, and labors folders.
      ii. Release the mouse button.
      iii. (Shift)-click the wives folder. It will deselect. (Shift)-click toggles icon selection on and off.
      iv. Drag only the wonders and labors folders into the ancient world folder.

6. Minimize your window size.
   a. Choose Option Special/Clean Up by Name. The two folders will move to the window’s upper-left corner.
   b. Zoom. The Cosmos window will shrink to its optimal size (see Figure 14.12).
7. View and Print the organized contents of the Cosmos folder in outline View.
   a. Activate the Cosmos window if it is not already active.
   b. Choose View / by Name to list the contents in alphabetical order.
   c. Expand the ancient world folder by clicking the triangles to the left of its name, as shown in Figure 14.13.
   d. Expand the labors, wonders, and wives folders by clicking their expansion triangles.
   e. Choose File / Print Window and then Print or OK to print the contents of the Cosmos folder. Print Window prints all the items in a window, including those that are hidden.

8. Contract all expanded windows by clicking their triangles.


---

The Hierarchical File System (HFS)

Officially, Macintosh file organization is called the Hierarchical File System, abbreviated HFS. It parallels real-life paper and manila folder filing. Using a file cabinet analogy, each hard or floppy disk represents a file drawer. When you open a disk window, it is like opening the file drawer. Inside the file drawer are folders and papers; inside the disk window are icons of folders, applications, and documents. When you open a folder window, it is like opening an individual manila folder; inside of each folder can be additional files and folders. You can have as many levels or layers of folders on a disk as your memory and storage permit.

A hierarchy is a pyramid-type organizational system. Each item has an organizational ranking, and all items of the same rank are at the same hierarchical level. At the top of each Macintosh file hierarchy is the disk. The next level contains all the items in the disk window, and so on. Figure 14.14 diagrams the hierarchical organization of the Data Disk.

Outline views show the hierarchy. Relate your printout from Guided Activity 14.4 to Figure 14.14. Your printout begins with the Cosmos folder, on the third level of the Data Disk hierarchy. The wives and ancient world folders are on the fourth level. On the fifth level are the h8 files, and the wonders and labors folders. The sixth level holds the wow and lh files.
Organization Guidelines

There are many ways to organize files in folders and no one method is best for every environment. What is important is to start a filing system. As your files increase in number, your filing system expands. If you decide to reorganize your files at a later time, the task will be much easier if the files are already grouped. To group your files, you need a basic plan. Here are a few organization tips:

1. Use logical groups. Keep similar files together. Some common groupings are:
   - by application—all documents created by a specific application are stored in its folder
   - by project—all documents that relate to the completion of one job, regardless of the application that created them
   - by subject matter—personal, business, client, games, and so on
   - by time increment—month, year, or century
   - by use—current, old, or to-be-trashed

2. Keep folder names short. Each name should be just long enough to describe the folder’s contents. Long names clutter the Desktop, and only their first 22 characters show in dialog boxes.

3. Avoid scrolling whenever possible. Keep files in smaller groups to avoid looking through long lists. On the Desktop, a 13-inch monitor can display 24 items viewed by Name.
4. Whenever possible, limit folder nesting to three or four levels. If you nest folders too deeply, you will have to open lots of windows to get what you need.

5. Keep frequently used files close to the top of the hierarchy.

The Path Menu

The hierarchical organization of a disk makes sense when you take the time to map it out, as shown in Figure 14.14. However, there are plenty of times in actual Macintosh computing when you can get very confused and ask “where am I?” or “how do I get from here to there?” The hidden Path menu will help.

At the Desktop

You cannot see the Path menu until you Command-press or hold down ~ while you press the active window’s title bar. Then the Path menu drops down to reveal the Path back to the disk icon. At the Desktop, the Path menu only navigates in one direction, to bring you from lower hierarchical levels towards the disk window, level one.

GUIDED ACTIVITY 14.5

Navigating the Desktop Path Menu

Guided Activity 14.5 shows you how to navigate the Data Disk hierarchy via the Path menu. You will begin at the Desktop with the Data Disk inserted and all windows closed. First, you will open successive windows and view their paths. Then, you will use the Path menu to move directly from one window to another. Refer to Figure 14.14 to keep track of your hierarchy location as you navigate.

1. Open the Data Disk, and view it by icon.

2. ~-press the window’s title. The title highlights, with a small floppy disk icon to the left of its name. Nothing else drops down because the disk window is at the top level of the hierarchy, as shown in Figure 14.15.

3. Release the mouse after you have seen the Path menu.

4. Open the West Student Data folder window and ~-press its title. This time, an actual menu drops down. At the top of the list is the West Student Data folder, with its open folder icon to its left. Below it is the Data Disk icon and name, to illustrate that the West Student Data folder is nested inside the Data Disk (see Figure 14.16).
5. Release the mouse after you have seen the Path menu.

6. Open the Cosmos window and [Esc]-press its window. Now the Path menu shows two levels of nesting; the Cosmos folder inside the West Student Data inside the Data Disk, as shown in Figure 14.17.

7. Release the mouse button.

8. Navigate the Data Disk via its path.
   a. [Esc]-press the Cosmos Path menu.
   b. Drag the Path menu to choose Data Disk and release the mouse button. The Data Disk window comes to the front.
   c. [Esc]-press the Data Disk Path menu. It only shows the Data Disk itself. At the Desktop, the Path menu can navigate from a folder to the disk itself, but not from the disk to any of its folders.

9. Close all windows.

**Within Other Applications**

When you are inside applications that create and use documents, the Path menu becomes more capable, allowing you to either find or to save documents in different folders and even in different disks. This multidirectional Path menu lets you navigate both up and down hierarchical levels.

Consider this scenario. Assume that the Word 5.1 application file is stored on your Hard Disk, inside a folder called MS Word nested inside another folder called Applications. To create a new MS Word document, you must first open the Applications folder, then the MS Word folder, and finally the Word 5.1 application itself. Therefore, your path position is two folders deep, on your Hard Disk.

When you Save your new document for the first time, that file will be saved where you were last in the hierarchical path. The document will be saved inside the MS Word folder nested inside the Applications folder on your Hard Disk. What if you want to save the document inside the Exercises folder on your Data Disk?
The Path menu lets you navigate the path to your Data Disk from inside the *Word 5.1* application, open the *Exercises* folder, and save your new document, named *Ex 14.1*, directly inside the *Exercises* folder. Figure 14.18 shows the path you would travel. The Desktop now becomes the first level of the hierarchy.

The Desktop button in the Save As dialog box is used to transfer from one disk to another, in this case from the Hard Disk to the Data Disk. The best way to understand the process is to try it.

**GUIDED ACTIVITY 14.6**

*Navigating the Path Menu from Inside MS Word*

Guided Activity 14.6 leads you through the path displayed in Figure 14.18. Begin at the Desktop with your unlocked Data Disk inserted, and all windows closed.

1. Locate the Word 5.1 (MS Word) application on your hard disk.

**NOTE** Your system will probably have the application in a different location than the one shown in Figure 14.19.

2. Open Word 5.1.
3. Type the following sentence in the Untitled document window: This is Exercise 14.1.

4. Choose File/Save As to display the Save As dialog box. A file saved with the destination shown in Figure 14.20 would be placed in the MS Word folder on the Hard Disk.

5. Examine your path position. Press the MS Word folder title to see the path back to the Desktop, as shown in Figure 14.21.

6. Click the Desktop button. This is the shortcut back to the Desktop. The dialog box changes to display all the icons on your Desktop in the scrollable list box, as shown in Figure 14.22.

7. Click to select the Data Disk icon within the scrollable list box. Data Disk is now the active disk and the Save button becomes an Open button, as shown in Figure 14.23.

**NOTE** Files directed to the Desktop are saved onto the Startup Disk. Even though Data Disk appears in the active disk position, a file now saved would be stored on the Hard Disk, with its icon appearing on the Desktop workspace.

8. Click Open to display an alphabetical listing of the Data Disk window items within the scrollable list box. The Open button changes back to Save, allowing you to save the file in the Data Disk window, as shown in Figure 14.24.
9. Click the closed West Student Data folder and then click Open to open the West Student Data folder shown in Figure 14.25. Notice that folder icons are black (selectable) and file icons are dimmed (nonselectable) because file icons do not contain openable folders. The vertical scroll bar on the right of the window activates, since there are more items in the West Student Data folder than can be displayed in the list box.

10. Apply step 9 to Open the Exercises folder. The Exercises folder is now the active window, as shown in Figure 14.26.
11. ⌘-press the Exercises title to see the path back to the Desktop as shown in Figure 14.27. Release the mouse button when you are done.

12. Save Ex 14.1 into the active window.
   a. Type Ex 14.1 in the Save Current Document As: box.
   b. Click Save.

13. Quit MS Word and close all windows.

   If you followed all the steps properly, Ex 14.1 should be inside the Exercises folder inside the West Student Data folder.

**Using Your Path**

Every time you save a new file, check where it will go before you click Save. Habitually navigate the path before you name each new document, so you know where the document will go. If you forget to check a file's destination and temporarily lose the file, however, the Finder can help you find it again.
Locating Lost Files

Your hard drive can hold hundreds—or even thousands—of files and folders. With so much storage capacity, it’s possible to lose files on a Macintosh hard drive. Here are some common ways to lose files:

- You forgot to check the destination in the Save As dialog box before you clicked Save. Or, while dragging a file icon across the Desktop, you accidentally released the mouse button.
- The file drops into one of the folders on your Desktop—but you have no idea which one. Perhaps you carefully put the file in a folder inside a folder last week (month, year?)—but you can’t remember where you put it.
- Elves (small children?) used your computer, and rearranged things.

Fortunately, it’s easy to find lost files.

How The Computer Finds A File

The invisible Desktop file holds the location of every file and folder on a disk. The Finder command File/Find displays the Find dialog box shown in Figure 14.28. You type the name of the item you are looking for in the Find box, click Find, and the Finder finds the item, opens the window that contains it, and highlights the file’s icon.

![Find dialog box](image)

Click the Find button

**WHAT REALLY HAPPENS**

The characters that you type into the Find dialog box form a *string*, a series of alphanumeric characters. When you click Find, the computer searches the Desktop file until it locates the first item that contains the string you typed. Then the Finder stops searching and displays that item on the Desktop.

**GUIDED ACTIVITY 14.7**

Finding Files

Guided Activity 14.7 shows you how to locate the Ex 14.1 file that you created in the last Guided Activity, and to locate other files as well. Begin at the Desktop, Data Disk mounted, with all windows closed.
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1. Choose File/Find.

2. Type Ex 14.1 into the Find box, and click Find. Wait while the Finder searches for your file. Since the Finder searches on all mounted disks, it may take a while. If found, the Finder will open the window that contains the file.

NOTE If you didn't find the file, you either saved it as something other than Ex 14.1, or searched for something other than Ex 14.1. While capitalization doesn't matter, spaces do. Ex 14.1 is not the same string as Ex14.1; the latter lacks a space between x and 1. The string in the Find box must match part or all of an item's name exactly or the computer will not be able to find the item.

3. To determine the window’s hierarchical location, press its title to view its path.

4. See what happens if no match is found. Repeat steps 1–2, but this time type Ex 77 into the Find box before you search. After searching, the Finder should display the dialog box in Figure 14.29.

5. Click OK and then use Find Again to locate more than one matching file. Each time that you choose File/Find Again, the Mac searches for an additional match to your search string.
   a. Find an icon that contains the file wow.
   b. Choose File/Find Again (⌘G) to find another match.
   c. Continue to Find Again until you hear an alert sound, letting you know there are no more matches.

6. Close any open windows.

**File Organization Assists Backing Up**

Organizing a disk makes it easier to locate and to back up essential files. For example, if you had all the files that you had made or altered separate from the West Student Data files, then you could back up only your unique files—knowing that the originals can be retrieved from your instructor.

But even after your files are organized, there's a catch. Most Macintosh systems have only one floppy disk drive. How do you back up from floppy to floppy if the drive can only hold one disk at a time? The easiest way is to use the hard disk as an intermediary. You place the items to copy into a folder and copy the folder and
its contents to the hard disk. Then, you eject the original floppy, insert the backup, and copy the folder from the hard disk to the backup floppy disk. After the folder is copied, check the backup to be sure everything is there and delete the intermediary folder from your hard disk.

Computer laboratories often have their hard disk protected so that students will not change or delete critical files accidentally. In this case, students save all work to floppy disks.

**GUIDED ACTIVITY 14.8**

*Selectively Backing Up Your Work*

Guided Activity 14.8 shows how to back up selected files and folders from one floppy disk to another. Begin at the Desktop.

**NOTE** You will need both your Data Disk and an additional blank floppy disk to do this Guided Activity.

1. Insert and Open your Data Disk.
2. Make a new folder named **My Work**.
3. **Shift**-click and drag all document icons in the Data Disk window into the **My Work** folder.
4. Close the Data Disk window, and choose File/Eject (Esc) to eject the disk, but leave it mounted.
5. Insert and initialize a new floppy disk. Name it **My Backup**. (Refer to Unit 2 if you’ve forgotten how to initialize a disk.)
7. Insert and Open your Data Disk.
8. Drag the **My Work** folder onto the **My Backup** icon. Dragging a folder from one location to another on the same disk moves it. Dragging a folder icon from one disk to another disk icon copies the folder and its contents onto the second disk.
9. Wait while the **My Work** folder and all the items it contains are copied onto **My Backup**. From time to time, the computer will eject one disk and ask for the other. Continue this floppy disk shuffle until the copy process is complete.
10. Put away your Data Disk and insert the new floppy disk, **My Backup**.
11. Open **My Backup** and check that the folder is there. Open the **My Work** folder to be sure its files are inside.
12. Close all open windows, highlight your backup disk, and choose File/Put Away (Esc Y) to dismount and eject the disk.
Deleting Unwanted Items

The Trash lets you remove things that you no longer need. You have already learned to drag a floppy disk’s icon through the trash to eject the disk and remove its icon from the Desktop. When you drag a floppy disk through the Trash, the disk’s contents remain intact.

The Trash has a second function: to delete files and folders from hard and floppy disks. Because the items that you trash are removed permanently from storage, you should only trash files and folders that you no longer need. (There are special utility programs that can sometimes restore trashed items. For general purposes, consider Empty Trash a permanent command.)

Item deletion is a two-step process both to prevent accidents and to let you change your mind. To delete a file or folder—and all the information it represents or holds—first drag the file or folder icon over the Trash icon, as if you were placing it into any other folder. The Trash bulges to let you know it contains one or more icons. The Finder command Special/Empty Trash performs the actual deletion. Empty Trash is not Undo-able. The Trash icons shrinks back to its empty shape once the Trash is emptied. Therefore, the empty Trash icon signifies that there are no items in the Trash folder, and the bulging Trash icon signifies that the Trash has contents.

Not every file can be deleted. The Finder prevents you from throwing away files you are using currently, or files that are in use. For this reason, you cannot trash your startup disk; its system software is in use whenever the computer is operating. Also, you cannot trash a file that is shared (on a network), and you cannot trash a locked disk or icon.

GUIDED ACTIVITY 14.9

Using the Trash to Delete Folders and Files

Guided Activity 14.9 shows you how to delete the excess files and folders you created in the last Guided Activity. You will also use the Trash safeguards: removing wanted icons from the Trash so that they are not deleted accidentally, and locking an icon so that it cannot be thrown away. Begin at the Desktop, with all windows closed.

1. Open the Data Disk window.
2. Duplicate second try.
3. Drag the second try copy icon into the closed Trash icon. The Trash will bulge, and second try copy will vanish from the Data Disk window.
4. Double-click the Trash to open its window. Locate the second try copy icon inside, as shown in Figure 14.30.
5. Choose Special/Empty Trash. Since emptying the trash is not Undo-able, the Empty Trash dialog box appears to warn you that any items in the Trash will be removed permanently (see Figure 14.31).

6. Click OK to empty the Trash. The second try copy icon vanishes from the Trash window, and the Trash icon returns to normal.

7. Close the Trash window.

8. Duplicate second try twice and file the copies into the word processing folder.

9. Delete the word processing folder and its contents from the Data Disk.
   a. Drag the word processing folder into the Trash.
   b. Empty the Trash. The Empty Trash dialog box alerts you that there are three items in the Trash: the word processing folder itself and the two second try copies, as shown in Figure 14.32.
   c. Click OK. The folder and all its contents are removed permanently from the Data Disk.

    a. Drag second try into the Trash.
    b. Choose Special/Empty Trash.
c. When the Empty Trash dialog box appears, click Cancel to avoid emptying the Trash.

d. Open the Trash window, and click the icon to select it.

e. Choose File/Put Away (⌘Y) to remove second try from the Trash and return it to its place in the Data Disk window. In addition to dismounting and ejecting a highlighted floppy disk, Put Away moves items from the Trash or the Desktop to their previous locations.

11. Lock a file and attempt to delete it. Locked files cannot be deleted or changed.

   NOTE Some applications will not operate if they are locked.

   a. Lock second try.

      i. Select the icon and choose File/Get Info (⌘I), as shown in Figure 14.33.

      ii. Click the box next to the word Locked in the box’s lower-left corner and close the Get Info window.

   b. Drag second try into the Trash.

   c. Empty the Trash. The alert box in Figure 14.34 appears.
d. Click OK.

e. Put Away second try.

12. Unlock second try.
   a. Select icon and choose File/Get Info (⌘I).
   b. Click the lock box to remove the x.
   c. Close the Get Info window.

13. Close all windows and Put Away your data disk.

*Trash Warnings*

- The Trash icon has only two appearances, empty and bulging. It bulges the same whether it holds one item or sixty.
- If you are not sure what is in the Trash, open it and check its contents before you empty it. *This warning is especially important if small children use your computer.* Many people have dragged an icon into the Trash and accidentally emptied the Trash—only to discover too late that they have lost important information.

*Managing Memory*

The first part of Unit 14 has focused on the organization of stored files. Now, let us examine the management of random access memory (RAM). After reviewing the distinction between storage and memory, you will determine how much total memory your Macintosh has and how that memory is allocated to individual applications. Then, you will open several applications simultaneously and use the Application menu to navigate swiftly among them.

*Storage Versus Memory*

Storage is the retention of program instructions, data, and processed information from one computing session to another. Memory is the computer’s workspace: the place where the computer holds program instructions, data, and information while processing occurs. For the computer to do its work, part or all of the open application(s) plus part or all of the relevant documents must be copied from storage into memory (RAM).

*Memory Utilization*

When turned off, the computer’s memory is empty. As the computer starts up, its system software is copied from storage into memory. When you open an application, such as MS Word, two things happen. First, the computer sets aside or allocates an empty block of RAM for the application and its related documents.
Second, the computer copies those parts of the program that it needs from storage and places them into the allocated memory block. The working copy of each open document is also held in the application’s memory allocation.

When you finish your work and quit an application, the computer *purges* or empties the previously allocated RAM block of its application and document contents, freeing up the memory block to do other work.

**How Much Memory Do You Have?**

*Total memory* is the amount of RAM installed in your Macintosh. *Available memory* or free memory is the amount of RAM currently empty. *Contiguous memory* is a single block of RAM with cells that are numbered sequentially and are adjacent to each other. To open an application, its machine code must be copied into contiguous memory.

*About This Macintosh* displays an information box, like the one shown in Figure 14.35, that shows the computer’s model name and number, the size of its total memory in Ks, and its system software version. This information box also shows which applications are loaded currently into RAM, and the size of the largest unused block of contiguous memory.

Figure 14.35 shows a Macintosh II computer running System 7.01a with a total of 8MB (8192K) of memory (your system software may be another size). The only application loaded currently into memory is the system software, leaving about 6MB (6017K) free for other applications.

The bottom part of the About This Macintosh information box displays a *RAM bar graph* of all currently open applications. The dark part of each bar shows proportionately how much of the program’s RAM allocation is filled; the light part shows how much of the RAM allocation is still free and usable. Figure 14.36 shows the bar graph that appears when MS Word is open (your computer may allocate a different amount of RAM).
GUIDED ACTIVITY 14.10

About This Macintosh

Guided Activity 14.10 acquaints you with your system’s About This Macintosh information box. You will choose /About This Macintosh, record information about your system, and close the information box. Begin with your computer turned off.

1. Turn on your computer.
2. Choose /About This Macintosh to view its information box.

**NOTE** If you are using a Macintosh Performa, choose /About This Computer instead. Performas have a slightly different operating system with a differently worded command.

3. Record these statistics about your computer in Figure 14.37:

**FIGURE 14.37**

*About This Macintosh fill-in*

- **a.** Computer type
- **b.** Total memory in system
- **c.** System software version
- **d.** Year(s) software created/updated
- **e.** Available memory
- **f.** Size of system software allocation

4. Leave the box open for the next Guided Activity.

**Memory Allocation**

Each application has a preset memory allocation, the size of contiguous RAM set aside for that application as it opens. When you open a given application, the Mac’s first step is to verify that it has an available RAM block of memory equal to or greater than the program’s preset memory allocation.
Each application has an Info box that displays its memory requirement. If you highlight the MS Word application icon and choose File/Get Info, you will see one of the two information boxes shown in Figure 14.38.

![Figure 14.38](image)

The Size near the top of the box refers to the amount of kilobytes or megabytes that the file occupies on disk; it is a storage measurement. The sizes at the bottom of the Get Info window, in the Memory or Memory Requirements box, are memory allocation measurements. Current size (7.0–7.01) or Preferred size (7.1) displays the actual allocation, the amount of RAM that the program and its documents are set to occupy.

**SIGNS OF INADEQUATE MEMORY**

If there is not enough memory to open a program, you should get a dialog box warning that there is not enough memory to open the application, and suggesting which open application to close. Sometimes, however, the computer will attempt to open a program, get part way, and produce an alert box explaining that “the application has unexpectedly quit.” At other times, there will be no warning at all. The computer attempts to open the program, and part way through the process the screen freezes, or a system bomb occurs. When this happens, you have no choice but to turn the computer off and on again. Remember, any unsaved work will be lost when you restart. Therefore, always save all open documents before you open an additional application.

**Multitasking**

Given enough total memory, you can load two or more applications into memory, and switch among the open applications as needed. This process is called multitasking. Multitasking enhances productivity; it lets you use time and resources efficiently.
Suppose you are using Excel to prepare your company's annual budget when your boss walks in and asks you to change a few words on yesterday's MS Word memo. Without multitasking, you would have to quit Excel and open MS Word to edit the memo. Then you would wait while the memo printed, quit MS Word, and reopen the Excel worksheet to continue where you left off. With multitasking, you could use your word processor and printer without having to quit the spreadsheet. Therefore, multitasking allows you to handle interruptions with minimum time loss.

Another multitasking benefit is the ability to open and use two or more applications in tandem to complete a single project. To write this book, we consistently multitasked among MS Word, a screen capture program called Exposure Pro, and the applications about which we were writing. For example, to write an Excel unit, we would write a step or two in MS Word, switch to Excel to actually do the step(s), then capture and edit the Excel screen in Exposure Pro. From Exposure Pro, we would copy the edited screen image into MS Word via the Clipboard. Without multitasking, it would have taken considerably longer to produce each unit.

**The Application Menu**

To minimize the confusion that can occur with several open applications, the Application menu in the right corner of the menu bar helps you keep things straight. Although you can have as many open applications as your memory permits, only one application at a time may be active, or in the foreground. The Application menu lists the open applications, identifies the active application, and permits navigation among open applications. When you first start up the computer, the Finder is probably the only open application. (Your computer might also have At Ease open; this security program prevents users from accidentally modifying things that they shouldn't modify.) The Finder should also be the active application; the Finder icon appears as the menu title and there is a check mark, ☑, next to its name in the pull-down menu. With only one open application, there is no other application to hide or show, so the first three menu choices are dimmed, like the left half of Figure 14.39. When you open another application, the Application menu lists two open applications, such as Finder and MS Word (Word 5.1) in the right half of Figure 14.39.

<table>
<thead>
<tr>
<th>Hide Finder</th>
<th>Hide Word 5.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hide Others</td>
<td>Hide Others</td>
</tr>
<tr>
<td>Show All</td>
<td>Show All</td>
</tr>
</tbody>
</table>

In this case, you can use the Application menu to move back and forth between the two open applications. The next Guided Activity will show you how.
GUIDED ACTIVITY 14.11

Using the Application Menu

Guided Activity 14.11 shows you how to use the Application menu to move back and forth between two open applications, Finder and MS Word. Begin with your computer turned off.

1. Start up the computer to reach the Desktop.
2. Press the Menu bar icon of the active application (Finder) to display the Application menu. The Menu should resemble the left half of Figure 14.39.
3. Choose  
   a. Confirm that only the system software (and possibly At Ease) is loaded currently.
   b. Close the information box.
4. Open the MS Word application. Watch the right corner of the Menu bar as the program loads. The Application menu title will change from the Finder icon to the MS Word icon as MS Word becomes the active application.
5. Type a sentence or two in MS Word and save the file to your Data Disk.
   **NOTE** Always save before you switch. Sometimes the screen will freeze or other problems will occur. Saved work won't be lost if you have to restart the computer.
6. Choose Application/Finder to activate the Finder. The Finder menu bar will appear, and any open Desktop windows will come to the foreground, on top of the MS Word document window.
7. Choose  
   a. Confirm that both the system software and MS Word are loaded, as shown in Figure 14.40.
   b. Close the window.
8. Choose Application/MS Word from the Application menu to make it the active application. The MS Word menu bar will appear and its document window will come to the foreground, sending the Finder into the background.
9. Choose Application/Hide MS Word to activate the Finder and hide the MS Word document window. The Hide Window command has two purposes. First, it makes your Desktop less cluttered; you don't see as many open windows stacked on top of each other, but the applications themselves remain open. Second, the Finder needs less time to redraw the screen when it has fewer windows to reconstruct.

10. Choose Application/Show All to display the hidden MS Word document window. The Finder still stays active, and MS Word remains in the background.

11. Choose apple/Calculator to open the Calculator desk accessory. The Calculator is now the active application. Its icon appears in the Menu bar, and its window is active.

12. Choose Application/Hide Others. The Calculator will have the only open window on the Desktop. The icons of the other open applications (Finder and MS Word) will dim on the menu to show that they are hidden, as shown in Figure 14.41.

13. Choose Application/Finder to activate the Finder and choose apple/About This Macintosh.
   a. Confirm that there are three open applications (see Figure 14.42).

14. Adapt step 11 to open the Puzzle and Note Pad desk accessories. Your Application menu and About This Macintosh should resemble those shown in Figure 14.43.

   NOTE With system software this large, a computer would require at least 5MB of RAM to open all these applications at once. (Your computer's system software is probably smaller.)

15. Practice using the Application menu to move among the various open applications. Finish with the Puzzle application active.
16. Close the Puzzle window to quit the Puzzle application and remove it from RAM.

17. Check both the Application menu and About This Macintosh to see that Puzzle is no longer listed. Quitting the Puzzle frees up 20K of RAM to use for something else.

18. Leave all the remaining applications open for the next Guided Activity.

**Click and Switch**

The Application menu is not the only way to activate an open application. Clicking the mouse on any visible part of a window activates its application and brings the clicked window to the foreground. Clicking on the patterned background of the Desktop brings the Finder to the front. Many people click and switch instead of using the Application menu because clicking is faster. Try it.

**GUIDED ACTIVITY 14.12**

**Clicking to Switch the Active Application**

Guided Activity 14.12 continues from Guided Activity 14.11, with the Finder, MS Word, Calculator, and Note Pad applications open and MS Word active. You will click onto different screen landmarks to activate each of the different open applications. When you are done, you will Shut Down; this allows the computer to quit all open applications and end your computing session with a single command.

1. Click the Desktop workspace to make the Finder active. The other open applications are now in the background.

2. Click inside the MS Word document window. MS Word activates, and the Finder moves into the background.

3. Shrink the MS Word document window with the size box to about a quarter of its original size.
4. Activate and drag the Calculator and Note Pad windows down and right, to separate them from the MS Word document window.

5. Click from window to window, watching the Application menu title change as you select a new window.

6. Reposition the windows so that they nearly cover each other.

7. Click on the different windows to activate their application. You only need to see a tiny bit of a window to click and bring it forward.

8. When you are done, activate the Finder and choose Special/Shut Down.

**NOTE** When you Shut Down or Restart with multiple open applications, the Mac must first close them. If you have unsaved changes in any of the open applications, those applications will be brought to the foreground one at a time, and you will be asked if you wish to save changes, as shown in Figure 14.44. Yes saves the changes, No quits without changing, and Cancel aborts the Shut Down or Restart command, leaving the application open.

**FIGURE 14.44**
The Save Changes dialog box

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**Close Versus Quit**

To be an effective computer user, you want to make the best use of your system’s available memory. A common mistake that beginners make is to close a document window instead of quitting the application. To prevent this problem, let us examine the memory effects of the Close and Quit commands.

**Close**

File/Close (⌘W), or its mouse equivalent clicking the close box, removes only one open file from RAM. Small applications, such as the Calculator, Note Pad, or Puzzle desk accessories, are totally contained in a single file. Consequently, when you close the window of one of these small applications, you remove its application file from RAM.

Most applications, including MS Word and Excel, create and use document files that are separate from the application file(s). Closing a document window removes only the document from RAM, leaving the application that created it open and available for more work.
Open

An open application with closed document windows doesn’t give you anywhere to work. Choosing File/Open from within an application that creates documents displays the **Open dialog box** from which you can locate and open a specific document. The Open dialog box, shown in Figure 14.45, looks and functions much like the Save As dialog box. You navigate the Path to the document you wish to open, highlight the document, and click Open. RAM permitting, you can open several documents from the same application one at a time, and then navigate among them as you do among different applications.

![Figure 14.45: The Open dialog box](image)

It takes much less time to close and open documents with the application loaded than it does to quit the application completely and start again from the Desktop. Only quit when you will no longer use the application at all, or if you need to purge one application from memory to make room to open another.

Quit

When you quit an application, you remove the application and all files associated with it from RAM. Use File/Quit (⌘Q)—rather than merely clicking the document close box—whenever you are done using a given application and do not plan to use it again in the current computing session, or if you need to purge RAM of the present application to make room for the next program you plan to use.

**GUIDED ACTIVITY 14.13**

**Open, Close, and Quit**

Guided Activity 14.13 fine-tunes your understanding of the Open, Close, and Quit commands. You will practice opening and closing files within MS Word, and then quit the MS Word application. Begin with your computer turned off.

1. Start up your computer and reach the Desktop. The Finder is the only open application (and possibly At Ease).
2. Insert your Data Disk. Locate and open the Cosmos folder and the wives folder within it. Inside the wives folder are seven related MS Word documents about England's Henry VIII and his six wives, as shown in Figure 14.46.

![Wives folder, viewed by Small Icon](image)

3. Open about h8. Both the document file and its associated application files load into RAM, and MS Word becomes the active application.

4. Read the document file. When you are done, click its close box to close the document, which removes the about h8 document from RAM.

5. Check the Menu bar to verify that MS Word remains the active application. Notice that although MS Word is open and even active, it does not have an open document window.

6. Click the Desktop workspace to activate the Finder. Since MS Word does not have an open window, only the Application menu or About This Macintosh can tell you that MS Word is still in RAM.

7. Open the 1 h8 file to read about Henry's first wife, Catherine of Aragon.
   a. Activate MS Word from the Application menu.
   b. Choose File/Open to select a document to open. The Open dialog box, shown in Figure 14.47, resembles the Save As dialog box. From it, you can navigate the Path menu to locate the file you wish to open.

![The Open dialog box](image)

c. Click 1 h8 to select it and then click Open. (Double-click 1 h8 for a shortcut.) The document loads quickly.
8. Read the file. 

9. Apply steps 8–9 to open the 2 h8 file to read about Henry’s second wife, Anne Boleyn. 

**NOTE** It was not necessary to close 1 h8 before opening 2 h8. The 2 h8 window opens right on top of 1 h8. 

10. Choose Window/1 h8 to activate 1 h8 and bring its document window forward. MS Word’s Window menu functions much like the Application menu; the Window menu displays the open Word documents and allows you to navigate among them. 

11. Adapt steps 8–9 to open 3 h8-6 h8. You now have six open document windows. 

12. Choose Application/Hide Word 5.1. MS Word and all the open document windows will be hidden. 

13. Choose Application/Word 5.1 to activate MS Word. 

14. Close all the MS Word documents, one at a time. 

15. Click the Desktop workspace to activate the Finder. 

16. Whoops, you forgot to quit MS Word. Do it! 
   a. Choose Applications/MS Word. 
   b. Choose File/Quit (⌘Q). Wait while MS Word and all its accompanying files are purged from RAM. 
   c. Check the Application menu to be sure MS Word is no longer listed. 

17. Shut Down. (This is your last Guided Activity.) 

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**Computer Viruses**

Unit 14 has shown you some strategies for managing your storage and memory. This discussion would be incomplete without examining how your system can become unexpectedly “managed” by a computer virus, and without demonstrating steps that you can take to prevent and eradicate viruses. 

A computer virus is an actively contagious application, designed as a prank or sabotage, that can invade your computer without your knowledge. The tiny, invisible program hides, replicates itself, and after a set period of time, takes over your Macintosh to make it do unexpected things. 

Fortunately, most Macintosh viruses have been nonmalicious; they may beep or display a message on your screen but they do not attempt to do anything destructive. Malicious viruses, on the other hand, are intentionally destructive; they are programmed to damage or delete files, or to destroy the contents of your hard disk. Even nonmalicious viruses are unintentionally damaging. Viruses occupy memory and disk space that you could otherwise use. But more seriously, nearly
every virus contains programming errors that can cause your computer to slow
down or can cause frequent system crashes.

Unless your Mac has had no new software since 1986, consider yourself at risk.
How do you contact a computer virus? Viruses travel from computer to computer
through floppy disks, networks, electronic mail (e-mail), on-line bulletin boards,
and modems. Floppy disks are the primary carriers. When you place your floppy
disk into a computer to save or open a file—and the computer is infected—you
inadvertently copy the invisible virus program onto your disk. Then, when you
insert that floppy disk in another computer, the virus copies from your floppy disk
onto the second machine’s hard disk.

How can you avoid viruses? Practice “Safe Hex.” (Hex is short for hexadeci-
mal, a base 16 numbering system used in computer programming.)

- Try to know where every floppy disk that enters your computer has been. (This
  is not often possible in computer laboratories.)
- Purchase all programs with shrink wrap intact, but understand that even
  shrink wrap can fail.
- Avoid unauthorized copies of software.
- Lock the original program floppies and copy them onto the hard disk. Be sure
  both the original and the copy are exactly the same size. Check periodically
  after use.
- Back up your important files.
- Use antiviral software to detect and eradicate viruses.

Antiviral software checks to see whether one or more known Macintosh virus
is lurking in the background, waiting to disrupt your computing. Most computer
laboratories keep anti-viral software on their hard disks to identify infected disks
when they are inserted, and remove their contaminated files. Locate and use the
most recent version of antiviral software. Old software can’t protect against new
problems.

Disinfectant is a free antiviral utility program written and regularly updated by
John Norstad and his colleagues at Northwestern University. First, Disinfectant
“scans” a hard or floppy disk to detect any hidden viruses; if needed, it then “disin-
fests” the disk to remove any found viruses. Disinfectant can be set up to check
each disk as you use it, and alerts you if it finds a problem.

While it is appropriate to be concerned about computer viruses, do not let your
concern discourage you from using your computer. In the words of Disinfectant
3.2’s online help:

“The virus problem is serious, but even more serious is the tendency to overre-
act to the threat. Organizations which impose severe restrictions on the use of
personal computers and personal computer software are doing more harm than
good. . . The heart of the personal computer revolution (especially the Macintosh
revolution) is the empowerment of the individual. At their best, personal comput-
ers are extensions of each individual’s imagination, unfettered by arbitrary rules
and regulations imposed by the corporate MIS priesthood. We cannot let the virus problem and other security concerns endanger this revolution.”

Now that you have been empowered, ENJOY!

**Summary**

Unit 14 has taken a second, more in-depth look at storage and memory, and their management. Beginning with storage, you examined the basics of Macintosh file management and the Hierarchical File Management (HFS). You duplicated and organized a Desktop disaster, turning Chaos into Cosmos. In the process, you created and used nested folders, and learned some time-saving icon selection techniques. Afterwards, you explored the relationship between the Cosmos folder and its underlying hierarchy, and used the Desktop Path menu to navigate quickly from window to window. You then moved from the Desktop to inside MS Word, and used the Save As Path menu to specify where each new file would be saved. Finally, you did some Macintosh housekeeping. You used the Find dialog box to locate misplaced items, and backed up selected files from your Data Disk to a new backup floppy disk.

Unit 14 also showed you some ways to make the most of your system’s memory. First, you used the About This Macintosh information box to measure your system’s total memory and its current allocation. Then you learned to multitask: to load more than one application into RAM and switch among the open applications. You used the Application menu to identify your open applications and to change the active application. You examined the RAM implications of opening, closing, and quitting programs and documents.

At the end of Unit 14, you learned that hidden, invisible computer viruses can sabotage your computing environment. To prevent virus problems, practice Safe Hex: know the history of each disk that enters your system, back up your files regularly, and scan all disks as they are inserted with an up-to-date antiviral program.

**Command Review**

- **View / by Name**: Displays small generic icons in an alphabetical list.
- **Expand a folder**: Click left-pointing outline triangle to display an indented contents list.
- **Retract a folder**: Click down-pointing outline triangle to hide its indented contents list.
- **Duplicate a folder**: Select item and choose File/Duplicate (⌘D) to create an exact replica and place it next to the original, with copy at the end of the duplicate’s name.
Copy a folder

Drag its icon onto the icon of a disk other than its own to replicate the folder onto the second disk, leaving the original intact and unmoved (the duplicate not renamed, since it is on a different disk than the original).

File/New Folder (⌘N)

Creates an empty untitled folder in the active window, or on the Desktop if no window is active.

Empty Trash

Choose Special/Empty Trash to delete files and folders currently in the Trash folder.

Lock a file

Click to place an x in the box next to Locked in the file’s Get Info window. This command prevents the file from being deleted or modified.

Unlock a file

Click to remove an x in the box next to Locked in the file’s Get Info window. Unlocking allows a file to be deleted or modified.

Clean Up a window

Activate the window and choose Special/Clean Up Window to arrange the window’s icons one at a time on the invisible grid.

Clean Up by Name

Activate the window, make sure that it is Viewed by Icon (View Menu), press Option and choose Special/Clean Up by Name to arrange the window’s icons all at once in alphabetical order on the invisible grid.

⌘-press

While the ⌘ key is pressed, press a window title or dialog box list to display its Path menu.

Put Away

Select an item and choose File/Put Away to move the selected file or folder icons from the Trash or Desktop workspace to their previous location. This command dismounts and ejects a selected floppy disk.

Find an icon

With the Finder active, choose File/Find (⌘F), type part or all of the name you seek, and click Find to scan all mounted disks to locate the first item that matches your criteria, and to display it on the Desktop.

Find Again

Choose File/Find Again (⌘G) to scan all mounted disks to locate the next item that matches your criteria, and to display it on the Desktop.

From within an application that creates documents, you should know these Macintosh commands:

Open

Choose File/Open (⌘O) to display the Open dialog box to locate and to open a specific document.
Guided Activity 14.8 showed you how to back up a few of the files you have created and stored on your Data Disk. Apply those skills to back up your Guided Activity and Exercise work and to reorganize your backup files.

1. **Back up your Guided Activity work.**
   
   a. **Create a new folder called** My Guided Activities inside the West Student Data folder on your Data Disk.
   
   b. **Choose View / by Date.** My Guided Activities will be at the top of the list with all of your files above the original West Student Data files.
   
   c. **Drag the** My Guided Activities folder onto the Desktop workspace.
   
   d. **With the marquee, select all of the files you created and drag them into the** My Guided Activities folder. The marquee also works in list views.
   
   e. **Drag the** My Guided Activities folder onto the Data Disk icon to file it away.
   
   f. **Modify the instructions from** Guided Activity 14.8 to copy the My Guided Activities folder onto your backup floppy disk.

2. **Apply the steps in Exercise 1 to create a folder named** My Exercises in the Exercises folder, place your exercises in it, and copy the folder onto your backup floppy disk.

3. **Reorganize your backup files. Use “before” and “after” directory printouts to compare their organizational structures.**

   a. **Print a “before” directory of your backup disk.**
      
      i. **Choose View / by Name, and expand all folders.**
      
      ii. **Choose File / Print Window.** Print Window will print the entire directory, not just what you can see in the window.

   b. **Create four new folders named** Word Processing, Graphics, Spreadsheets, and Database.

   c. **Open the** My Work folder and drag all word processing files from this folder into the** Word Processing folder.
d. In turn, move any word processing files from the My Guided Activities and My Exercises folders into the Word Processing folder.

e. Drag your graphics, spreadsheet, and database files from the My Work, My Guided Activities, and My Exercises folders to their correct application-based folder.

f. Check the My Work, My Guided Activities, and My Exercises folders to be sure that they are empty (0 items), and then delete the empty folders.

g. Repeat step a. to create an “after” directory printout.

h. Compare the two printouts to understand how the Mac’s hierarchical file system permits different organizations.

Review Questions

Multiple Choice

1. _________ help you to organize your Macintosh files.
   a. filing cabinets  
   b. disks  
   c. folders  
   d. documents

2. The Empty Trash command will not delete
   a. a locked file  
   b. a file shared on a network  
   c. a file currently in use  
   d. any of these

3. Random Access Memory (RAM) is
   a. the file’s permanent storage area  
   b. the computer’s workspace  
   c. the computer’s permanent storage area  
   d. all of these

4. What happens when you choose File/Close?
   a. your Desktop pattern vanishes  
   b. your current application closes, but the document you are working on remains open
c. your current document closes, but the application itself remains open
d. the computer and all peripherals turn off all at once

5. Computer viruses
   a. can invade your Macintosh secretly
   b. are often spread by floppy disks
   c. are usually pesky rather than malicious
   d. all of these

**True or False**

1. ___ The Finder prevents having two same-named items in the same folder.
2. ___ Check the Path menu in the File/Save As dialog box before you save your file to ensure that you store the file in its intended location.
3. ___ You can have MS Word, Excel, and two desk accessories open at once if your system has 4MB of RAM.
4. ___ Once you set a file’s destination, its hierarchical position is permanent.
5. ___ Once the Find command has located your file, you can use the Path menu to determine the file’s location.

---

**Key Terms**

Active
Actual allocation
Allocate
Antivirus software
Application menu
Available memory
Bulging trash icon
Close
Command-press
Computer virus
Contiguous memory
Copy dialog box
Current size
Default folder name
Destination
Disinfectant
Duplicate
Empty Trash dialog box
Empty Trash icon
Find Again
Find dialog box
HFS
Hierarchical file system
In use
Malicious
Memory
Memory allocation
Multitasking
New folder
Nonmalicious
Open
Open dialog box
Path
Path menu
Preferred size
Purges
Put Away
Quit
RAM bar graph
Size
String
Total memory
Trash
Window menu
Multiple Choice
1. a.
3. d.
5. b.

True or False
1. T
3. F
5. T

Fill In the Blanks
1. a. PROBLEM The light from the window glares directly into the user’s eyes.
   SOLUTION Shade the window or turn the monitor so that the window is not directly behind it.

   c. PROBLEM The chair is too low and does not provide adequate support.
   SOLUTION Replace the chair with an adjustable one.
e. **PROBLEM** The chair is too low for the user's feet to rest flat on the floor.
   **SOLUTION** Provide an adjustable chair with a higher seat.

g. **PROBLEM** The monitor is too high.
   **SOLUTION** Adjust the monitor on its swivel base so that it is lower.

---

**Unit 2**

**Multiple Choice**

1. a.
3. a.
5. c.

**True or False**

1. T
3. T
5. F

**Fill In the Blanks**

1. Identify these system components and their functions: input, output, process.

<table>
<thead>
<tr>
<th>Components</th>
<th>Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Monitor</td>
<td>Output</td>
</tr>
<tr>
<td>c. Keyboard</td>
<td>Input</td>
</tr>
<tr>
<td>e. Floppy disk drive</td>
<td>Input and output</td>
</tr>
</tbody>
</table>

3. a. Number of items
   b. Number of kilobytes already used
   c. Number of kilobytes remaining

5. Disk
**Multiple Choice**

1. a.
3. d.
5. b.

**True or False**

1. T
3. F
5. T

**Fill In the Blanks**

```
ENTER  O  D

A  I  G  P
E

WORDPROCESSING  A  S
OR
X  L  R  E
R  O  FUNCTION  E  A  L
D  N  B
GE
W
ALPHANUMERIC
R
P
O
AT
A
R
Character
P
T
K
O
HARD
K
N
INSERT
DELETE
TO
Y
F
BEAM
T

SAVE
RD
```
ANSWERS TO REVIEW QUESTIONS

Unit 4

Multiple Choice
1. a.
3. c.
5. a.

True or False
1. T
3. F
5. F

Fill In the Blanks
1. d.
3. e.
5. c.

Unit 5

Multiple Choice
1. a.
3. c.
5. b.

True or False
1. F
3. T
5. F
Fill In the Blanks

1. Window parts
   a. 6
   c. 7
   e. 2
   g. 5
   i. 11
   k. 3
   m. 15

Multiple Choice

1. c.
3. d.
5. d.

True or False

1. T
3. T
5. F

Fill In the Blanks

1. Identify these commands:
   a. Z
   c. C
   e. A
   g. O
   i. Q
Multiple Choice

1. a.
3. b.
5. a.

True or False

1. F
3. F
5. T

Fill In the Blanks

LANDSCAPE
PAGEBREAK
SPELLCHECKER
LAYOUT
POWEROUP
HORIZONTAL
DOCUMENT
AUTOMATIC
FOOTER
Unit 8

Multiple Choice
1. b.
3. d.
5. c.

True False
1. T
3. F
5. F

Fill In the Blanks
1. Point size indicator, 12 points selected
3. Italics button, deselected
5. Show nonprinting characters button, selected
7. Center alignment button, deselected
9. Justified alignment button, deselected
11. One-and-one-half line space button, deselected

Unit 9

Multiple Choice
1. d.
3. a.
5. c.

True or False
1. T
3. F
5. T
Fill In the Blanks

1. Selection tool
3. Rectangle tool
5. Arrowhead tool
7. Text tool
9. Group tool

Unit 10

Multiple Choice

1. c.
3. d.
5. a.

True or False

1. F
3. T
5. F

Fill In the Blanks

1. a. Enter text
c. Format text
e. Print text

Unit 11

Multiple Choice

1. d.
3. c.
5. c.
**True or False**

1. T
3. T
5. F

**Fill In the Blanks**

1. Reference area, active cell’s reference displayed
3. Chart legend
5. Fill handle
7. Heading, row 9

---

**Unit 12**

**Multiple Choice**

1. b.
3. b.
5. c.

**True or False**

1. F
3. F
5. T

---

**Unit 13**

**Multiple Choice**

1. d.
3. c.
5. c.


**True or False**

1. T
3. F
5. F

---

**Unit 14**

**Multiple Choice**

1. c.
3. b.
5. d.

**True or False**

1. T
3. F
5. T
ABSOLUTE REFERENCE Keeping a spreadsheet's cell reference constant or unchanging when a formula is copied or moved to another location. Compare with Relative Reference.

ACTIVE Currently selected, in use, or otherwise available, such as: the disk or application currently selected, the front-most window on the Desktop, the active spreadsheet cell, a black menu command, or a gray scroll bar.

ADDRESS Noun: a computer location identified by a specific name, number, or code label. Verb: to use, such as in RAM.

ALARM CLOCK The clock and calendar desk accessory included with the Macintosh operating system software.

ALERT The computer's way of letting you know when it cannot follow a command or there is some other problem. See also Alert Sound and Alert Box.

ALERT BOX A window that an application displays to warn you of a problem or an error. The box usually contains text to describe the situation, and one or more buttons to acknowledge or rectify the problem.

ALERT SOUND The sound that the computer makes to signal a problem.

ALIAS A small file that contains the address or location of its original file. When clicked, the alias icon finds and opens the original.

ALIGNMENT 1) The relationship of a paragraph to its right and left margins. 2) The relationship of spreadsheet cell contents or graphical text block contents to its boundaries. See also Left aligned, Right aligned, Centered, and Fully justified.

ALLOCATION RAM set aside or allotted for use by specific software programs.

ANTI-VIRAL SOFTWARE Application programs that detect and often eradicate computer viruses.
APPLE MENU The customizable collection of frequently used files and folders that may be accessed from under the Apple logo, ⋆, in the left corner of the Menu bar.

APPLICATION MENU The menu titled by the active application's icon in the right corner of the Menu bar. The Application menu lists the open applications, identifies the active application, and permits navigation among open applications.

APPLICATION PROGRAM A set of commands written to allow you to accomplish a task, such as word processing or spreadsheet calculations.

ARITHMETIC OPERATOR A symbol that tells a program to perform an arithmetic operation, such as addition (+), subtraction (-), multiplication (*), or division (/).

ASCENDING Sorting from beginning to end, such as from A–Z or 1–100. Contrast with Descending.

ASCII ALPHABETIZATION The ordering of characters and character strings according to their ASCII equivalents. May cause unexpected results when “alphabetizing” numbers.

ASCII The acronym for the American Standard Code for Information Interchange, the standardized computer character set used by most computers to achieve compatibility among different computer devices and computer systems. Each character is assigned a unique eight-digit binary number.


BACKGROUND PROCESSING The ability of some open applications to continue processing data in the background while you do something else in the foreground.

BACKUP An archival copy, an exact replica of an original item. You can back up an individual file, the contents of an entire floppy disk, or even the contents of an entire hard disk.

BALLOON HELP Cartoon balloons that describe on-screen landmarks. This teaching tool is turned on and off from the Help menu.

BASE 2 Another name for the Binary Numbering System.

BEEP One form of alert sound. See also Alert Sound.

BINARY NUMBERING SYSTEM The two-digit numbering system that the computer uses to count, measure, and perform arithmetic operations. Uses only two digits, one and zero, because each circuit is either on (1) or off (0). Also called Base 2.

BIT The smallest binary unit or Binary Digit. Each bit represents a single on-off circuit.

BIT-MAPPED Graphics or fonts whose images consist of patterns of square dots.

BUG Something that is wrong with a piece of hardware or software. Computer scientist Grace Hopper discovered a moth in an early computer that caused problems, hence the derivation of the term.

BUTTON An on-screen command box or oval that represents a command. When you click a button, its command activates. Sometimes, buttons will be in dialog boxes, such as OK or Cancel; other times groups of buttons will be collected into button strips, such as the Toolbar in MS Word or Excel. Some programs, such as FileMaker Pro, allow the user to create custom buttons.
**BYTE** A combination of eight bits. Unique bytes represent each letter of the alphabet, numeric digit, or other characters you type.

**CACHE** A temporary holding area in RAM where the computer stores repeatedly used information.

**CALCULATOR** The four-function arithmetic calculating desk accessory that is included with the Macintosh operating system software.

**CASE** Refers to whether letters are uppercase (all capital letters) or lowercase (all small letters).

**CASE SENSITIVE** A command that is responsive to the difference between uppercase and lowercase letters, such as between *Case* and *case*.

**CELL** The smallest unit of a spreadsheet, the data container formed by the intersection of a column and a row.

**CELL REFERENCE** Each spreadsheet cell's location in the matrix, named by the combination of its column letter and its row number, such as C8.

**CENTERED** Paragraphs, cells, or text blocks whose contents are formatted to appear equidistant between their left and right boundaries.

**CENTRAL PROCESSING UNIT** The computer's central switching station, where the actual processing of data into information occurs.

**CHARACTER** A single typed letter, number, punctuation mark, or other symbol.

**CHARACTER FORMATTING** The process of determining what form a character will take. Examples of character formatting include font, size, type style, position, and color.

**CHART** The graphical presentation of worksheet data.

**CHECK MARK ✓** Check marks are often used in menus and lists to indicate which item is currently chosen, or if a toggle command is on or off. In Excel, clicking the check mark in the Formula Bar enters data into the active cell.

**CHOOSER** The desk accessory that lets you choose among the printers, shared storage devices, and communication devices that are attached to your computer.

**CLICK** A quick press and release of the mouse button.

**CLIP ART** A collection of ready-made graphic images stored on disk.

**CLIPBOARD** A special place in memory that holds the selection you Cut or Copied. Clipboard information is lost when the Macintosh is turned off or restarted, and replaced with a new selection every time you Cut or Copy.

**CLIPBOARD FILE** The file that contains the Clipboard's contents.

**CLOSE BOX** The box on the left side of the active window's title bar. Clicking the close box closes the window and removes its contents from RAM.

**CLOSE** The command that removes that file from RAM. If document files are independent from an application’s file (or files), closing a document will not purge the application from RAM. *Compare with* Open and Quit.

**CODE** The contents of a computer program.

**COLUMN** A vertical line of spreadsheet cells. *Compare with* Row.

**COLUMN HEADING** The letter that names a specific spreadsheet column, ranging from A–Z, AA–AZ, and so on.
**Command**  A user-initiated signal that controls a specific computer operation.

**Compatibility**  The capability of one computer to run the software or to process the information created on another computer.

**Component**  An individual piece of computer hardware.

**Computer**  An electronic machine that follows human instructions to process data into information.

**Computer System**  The computer itself and any connected machines, its operating instructions, and the people who operate or control the machinery and instructions. The hardware, the software, and the end user(s).

**Computer Virus**  An actively contagious application, designed as a prank or sabotage, that can invade a computer without the user’s knowledge.

**Conflict**  An adverse interference between the instructions of one software program and another that causes one or both applications to perform other than as planned. A severe conflict can prevent a computer from operating.

**Consistent User Interface**  A uniform computing environment that doesn’t vary from program to program.

**Constant**  Numeric data that does not change when other values in a spreadsheet or other program change.

**Constrain**  To limit an object’s range of motion. In graphics, drawing tools can be constrained to draw straight lines, circles, or squares.

**Control Panel**  A small program that allows the user to adjust specific system-related settings.

**Copy**  The Edit menu command that duplicates selected information into the Clipboard to Paste into another location. See Cut and Paste.

**CPU**  Abbreviation for Central Processing Unit.

**Curly Quotes**  Typographically correct opening and closing quotation marks and apostrophes. Also called Smart Quotes.

**Custom Icons**  Individually designed graphics that most software designers use in place of generic icons. Compare with Generic Icons.

**Cut**  The Edit menu command that deletes a selected block of text or graphic from a document and places it into the Clipboard to Paste into another location. See also Copy and Paste.

**Data**  Letters or numbers used individually or in combination to represent facts or events.

**Database**  An information management system. A collection of related topics, themes, or ideas stored on a computer and arranged for information retrieval and manipulation.

**Decimal Numbering System**  A ten-digit numbering system. The system most commonly used by technological societies.

**Default**  1) Noun: an automatic decision that a software program makes for you unless you explicitly change it. For example, the Finder’s default view is by icon; every Desktop window will open in icon view until you change the view. Application-specific defaults include page size and orientation, and text font, size, position, and style.  2) Verb: to revert to one of these automatic settings.
DEFAULT CELL ALIGNMENT The left alignment of labels and right alignment of values in spreadsheets to show how each cell’s data may be formatted and used.

DELETE To remove or erase something. For example, you can delete characters from a word processing document, objects from a graphic document, or cell contents from a spreadsheet document. You can also delete files and/or folders from a disk.

DESCENDING Sorting from end to beginning, such as from Z–A or 100–1. Contrast with Ascending.

DESELECT Remove highlighting from an icon, text block, or other item. When you deselect an object, it is no longer active.

DESK ACCESSORIES Small programs accessed from the Apple menu that assist you with day-to-day tasks.

DESKTOP The primary work area for all Macintosh tasks. The home base from which you can manipulate stored files and use application programs.

DESKTOP FILE The invisible table of contents that belongs to each Macintosh disk.

DESKTOP PATTERN The background area design on your computer screen.

DESKTOP PUBLISHING APPLICATION Software programs that allow personal computers to generate typeset-quality text and graphics.

DESKTOP WINDOW The window that you see when you open a disk or folder icon. Desktop windows display the directory of the disk or folder’s contents.

DESTINATION The place where command results will appear, such as the active spreadsheet cell or the active Desktop window.

DIALOG BOX A window that is used for a special or limited purpose, such as to name a file and to set its destination before actually saving the file. A dialog box is a command intermediary; it solicits information from you to carry out your command.

DIRECTORY A storage medium’s table of contents. On the Macintosh, managed by the Finder.

DISK A physical medium capable of storing information.

DISK CACHE A small block of RAM that is set aside to hold a second copy of the most recent program code and data that is read from storage into memory.

DISK DRIVE A device capable of reading and writing storage information to and from a disk.

DISK ICON A disk’s visual representation on the Macintosh screen.

DISMOUNT To remove a disk’s icon from the Desktop and its Desktop file from RAM.

DOTE S PER INCH (DPI) 1) On screen, the number of screen dots, or pixels, per linear inch of the computer screen. 2) When printing, the number of dots of ink per linear inch that the printer can produce. See also Resolution.

DOUBLE-CLICK Two quick successive clicks of the mouse button.

DPI See Dots Per Inch.

DRAW Software programs or modules that produce object-oriented graphics. See also Object-oriented Graphics.

DRIVER SOFTWARE The software instructions that manage the devices attached to your computer.
D O W N  M E N U  A list of commands, normally hidden from view, that appears whenever you press a Menu title.

DUPLICATE To make an exact replica of something, for example: a disk, a file, a folder, or a graphical element.

EDIT To change something.

EJECT To remove a floppy disk from a disk drive.

E L E C T R O N I C  T Y P O G R A M Y  The use of the computer to produce and arrange aesthetically pleasing and readable text.

E L E M E N T  Each graphical object in MS Word’s Picture module.

E N C A P S U L A T E D  P O S T S C R I P T  (E P S )  High-end graphics programs that use PostScript to create, format, and modify graphical objects. Can also refer to graphical images produced by one of these programs. See also PostScript.

E N D  O F  F I L E  M A R K  The dark horizontal line that indicates the end of a MS Word document. Other applications may indicate the end of file with a different symbol.

E N D  U S E R  A person who operates or uses the computer system.

E N T E R I N G  T E X T  Sequential key pressing to input characters.

E P S  See Encapsulated PostScript.

E R G O N O M I C S  the science that studies the physical relationship between people and their work environment.

E X P A N D  1) To make larger. 2) To reveal more contents, such as in a folder. Compare with Retract.

E X T E N S I O N  A file that adds features or capabilities to another program, such as your standard operating system software or a specific application.

E X T E R N A L  G R A P H I C  An image that is created outside of a given application and brought in. Compare with Internal Graphic.

E X T R A C T I O N  In Excel, the process of isolating database records that match specific criteria and copying these records to another worksheet area (Extract Range) for further use.

F E A T U R E S  The specific determination of what each application program can do; the bells and whistles that give individual programs their personalities.

F E E D B A C K  A form of output that immediately cycles back to the system’s input or processing areas for modification. Feedback forms the basis for interactive computing.

F I E L D  Each individual category of information in a database record.

F I E L D  N A M E  The descriptive name of each database field.

F I E L D  T Y P E  The specific type of information that a particular field is defined to hold, such as text, numbers, or pictures.

F I L E  1) A discrete, named unit of computer work that is saved to a disk. 2) In database terminology, an entire saved collection of information.

F I N D E R  The Macintosh’s operating system software file that lets you locate, move, open, close, and delete files and folders. The Finder generates and updates the Desktop file.

F L O P P Y  D I S K  A thin, flexible mylar storage medium.
FOLDERS  Organizational containers that hold files and other folders.

FONT  A named set of characters of distinct design, such as Times or Palatino (technically, a typeface).

FOOTER  Repeated information printed in the bottom margin of every printed page in a document. Compare with Header.

FORMATTING  1) Creating tracks and sectors on a storage medium to let the computer know where to store and retrieve files on that medium. Also called Initialization. 2) Changing a document's appearance, such as the display of its characters or the size of its indents and margins.

FORMULA  A mathematical statement that derives its value from values found elsewhere in a spreadsheet, database, or other program. See also Function.

FUNCTION  A built-in formula. See also Formula.

G  Abbreviation for a gigabyte.

GENERIC ICONS  Finder-drawn icons that are used unless an application replaces them. See also Custom Icons.

GIG  Abbreviation for a gigabyte.

GIGABYTE  A billion bytes.

GIGO  Garbage In Garbage Out.

GRAPHICS  Application programs that create, modify, and print computer-generated images and pictures.

HANDES  Square dots on the edges of a graphical object to indicate that the object is selected. You can press and drag a handle to resize the selected object.

HARD COPY  Output printouts.

HARD DISK  A flat, round platter that serves as a storage medium and is capable of storing large quantities of information.

HARD RETURN  Manually pressing Return to end a computer paragraph and bring the insertion point to the next line. Also called a Manual Return.

HARDWARE  The physical equipment and components in a computer system.

HEADER  Repeated information printed in the top margin of every printed page of a document. Compare with Footer.

HELP MENU  The menu titled by the cartoon balloon question mark on the right side of the menu. The Help menu always provides access to the Finder's balloons, and often to application-specific topical help.

HFS  Abbreviation for Hierarchical File System.

HIDDEN CHARACTERS  Characters that are not displayed on the physical keyboard, such as ≠ or ⬤, but can be typed by combining the Option and sometimes Shift with alphanumeric characters.

HIERARCHICAL FILE SYSTEM  The official name of the Macintosh's storage organizational system.

HIERARCHY  A pyramid-type organizational system in which each item has an organizational ranking, and all items of the same rank are at the same hierarchical level.

HIGHLIGHT  The change in screen color to show that an item is selected or activated.

I-BEAM  The pointer's shape when its function is text-oriented.
Abbreviation for Input-Output.

An on-screen representational picture.

A screen element, such as a window or a disk, that is not available currently. Inactive items are deselected. Inactive windows do not display their close, size, or zoom boxes; inactive scroll bars do not display their scroll arrows or scroll boxes. Inactive menu choices are dimmed.

Display a paragraph's indentation setting in the Ruler.

In word processing, the width of a paragraph relative to the document's right or left margins. See also Margin.

Processed data. Data that has been manipulated in a way that is meaningful to the computer user.

The line or two of information just below the title bar in a Desktop window. The information bar provides storage statistics.

See Formatting.

The entering of data into the computer.

A device, such as a disk drive, that can both read (input) and write (output) files.

1) To put a floppy disk into a disk drive. 2) To add text at the insertion point location. 3) To add a row, column, or group of cells to a worksheet.

The blinking vertical line that indicates where the next text you type will appear on screen.

To add software to storage in a way that the software can be used.

An application package that combines at least three software functions.

Computing that is dependent upon user feedback.

Computing systems in which the user has some control over the computer's operations. The norm in personal computing systems.

A graphic that is created entirely within the application where it will be used. Compare with External Graphic.

Paragraphs, cells, or text blocks whose contents are formatted to line up straight against both their left and right boundaries by adjusting the space between the individual words in each line.

Macintosh abbreviation for kilobyte. (IBM users abbreviate KB.)

The desk accessory that lets you look up each font's hidden characters, and determine the keystrokes to produce them.

A piece of input hardware with keys like a typewriter.

A keystroke combination that replaces a pull-down menu command.

Approximately one thousand bytes. 1024 bytes.

An identifier. In a spreadsheet, cell data that will not be used for calculation. Descriptions used for headings and explanations. Contrast with Value.

Wide document orientation. Compare with Tall or Portrait.
**LAYOUT** A user-defined arrangement of document elements, such as page layout in desktop publishing, or field and label layouts in databases.

**LEFT ALIGNED** Paragraphs, cells, or text blocks whose contents are formatted to line up straight against their left boundaries, with ragged right edges.

**LINE SPACING** The amount of space that separates each line of text in a paragraph or text block.

**LOCK** To make a file or storage medium unalterable.

**MACINTOSH** A model of personal computers first produced by Apple Computer, Inc., in 1984. There are many different Macintosh computers currently in the Macintosh line.

**MACRO** A stored list of program commands.

**MANUAL PAGE BREAK** A user-determined page break. Also called a Hard Page Break.

**MANUAL RETURN** See Hard Return.

**MARG** The blank space at the edge of a printed page surrounding the text area. Each document has four page-margin measurements: top, bottom, right and left. See also Indentation.

**MARQUEE** A selection rectangle that can be drawn to quickly select a group of contiguous graphical objects or Desktop icons.

**MB** Written abbreviation for megabyte.

**MEG** Spoken abbreviation for megabyte.

**MEGABYTE** Approximately a million bytes or a thousand kilobytes.

**MEMORY** Special computer chips that hold data and information so that the CPU can access and manipulate them. See also Random Access Memory.

**MENU BAR** The white bar across the top of the screen that contains the pull-down menu titles. The Menu bar titles change, reflecting the active application.

**MILITARY TIME** Time according to a 24-hour clock. Compare with Standard Time.

**MODEM** A device that lets computers communicate with one another via telephone lines.

**MODIFIER KEYS** Keyboard keys, such as Shift, Caps Lock, Control, and Option, that perform no action by themselves, but combine with other keys to change their function.

**MODULE** A program within a program, such as MS Word’s Picture or Excel’s Chart.

**MONOSPACING** A font with typewriter-style spacing between letters such that each character occupies the same amount of horizontal space. Compare with Proportional Spacing.

**MOUNTING** Loading a disk’s directory into RAM to access its files.

**MOUSE** Hardware device that lets you control the on-screen pointer.

**MULTITASKING** Loading two or more applications into memory, and switching among these open applications as needed.

**NANOSECOND** A billionth of a second.

**NESTING** Placing one thing inside of another, such as nested Desktop folders.
NONPRINTING CHARACTER Characters such as Return, Tab, and Space that operate but do not print. Many word processing programs let you display and hide these nonprinting characters on screen.

NOTE PAD A desk accessory included with the Macintosh operating system software that lets you enter and save short notes.

NUMBER FORMAT The determination of how numbers will be displayed, establishing the number of decimal places, the presence or absence of commas, and the appearance of dollar or percentage signs.


OBJECT-ORIENTED GRAPHICS Drawing programs in which each graphical image consists of discrete objects that can be selected, moved, formatted, and edited independently. Also called Vector Graphics.

ONLINE Accessible through your computer.

ONLINE HELP A miniature instruction manual accessible on your computer screen to help you use a particular software program. Typically accessed under the Help menu.

OPEN To reveal an icon’s contents window, or to launch an application program. When you open an icon, you replicate some or all of its contents into RAM for processing. Compare with Close and Quit.

OPERATING SYSTEM SOFTWARE The basic instructions that a computer needs to start up and to perform basic tasks such as displaying information on the monitor, keeping data organized, and retrieving and storing information. Often shortened to System Software.

ORIENTATION A document’s print direction, either tall or wide.

ORPHAN An alias whose original or parent file has been deleted from storage.

OUTLINER An application program or module that allows you to plan and organize a document by equating outline headings with document headings.

OUTPUT Displaying the results of data processing.

PAGE BREAK The place where the text of one printed page ends and the next printed page begins. See also Automatic Page Break, Manual Page Break.

PAGINATION The software process of dividing a document into printable pages based on the document’s paper size and margins.

PAINT Bit-mapped graphics.

PANES Divisions of a document window that can be scrolled independently to view discontinuous parts of that document.

PAPER SIZE The size of paper that a given document is prepared for and printed on, such as letter (8 1/2 x 11 inches) or legal (8 1/2 x 14 inches).

PARAGRAPHS MARK ¶ The nonprinting character generated by pressing the Return key.

PARAGRAPHS, COMPUTER The text distance from return to return. Compare with Paragraph, Grammatical.
**PARAGRAPH, GRAMMATICAL** A collection of sentences on a related topic. Since this definition depends on meaning, it cannot be applied uniformly by word processing programs. *Compare with Paragraph, Computer.*

**PARAMETER** A setting, value, option, or characteristic that an application program requires from the user to complete a command.

**PARAMETER RAM** A special, battery-powered memory chip that retains control panel settings from one computer session to another.

**PASTE** The Edit menu command that places a copy of the Clipboard’s contents at insertion point or selection location. *See also* Cut, Copy.

**PATH** The Finder’s navigational trail from one storage location to another.

**PATH MENU** The pop-up menu in some windows and dialog boxes that lets you navigate from one storage location to another.

**PIXEL** An individual screen dot. The smallest dot that you can draw on the screen.

**POINT** 1) Noun: a typographical measurement, \( \frac{1}{72} \) of an inch. 2) Verb: to roll the mouse so that its pointer (hot spot) is on top of a particular item, or in a particular location on screen.

**POINTER** 1) The mouse- or track ball-driven on-screen marker that helps you to operate the computer. The pointer’s shape changes, depending upon its current function. 2) A file, such as an alias, that points back to its original location.

**POP-UP MENU** Any menu that appears when you press a screen element other than a menu title, such as the font or size menus that pop up from the MS Word Ribbon.

**PORTRAIT** Wide document orientation.

**POSTSCRIPT** A graphical computer language created by Adobe Systems to define how printed documents look in precise detail. PostScript images adjust automatically to print at the maximum resolution of your current printer.

**POWER SURGE** An extra burst of power that lasts for several seconds. Surges can destroy data, and even damage equipment. *See also* Surge Protector.

**PRAM** Abbreviation for Parameter RAM.

**PREFERENCE FILE** A file that stores the customized default settings for a specific application.

**PRESS** To put your finger down on the mouse button and keep it down.

**PREVIEW** The on-screen examination of document pages as they will be printed, displaying the text area, header, footer, and margins.

**PRINT AREA** The part of a document that will be printed.

**PRINT MERGE** To combine data from two or more documents into a single printout or series of printouts. Examples include form letters and mailing labels.

**PRINTER** An output device that sends processing results to hard copy.

**PRINTOUT** Hard copy.

**PROCESSING** The transformation of data into information.

**PROOFREAD** To carefully read through a document to check for errors.

**PROPORTIONAL SPACING** A font whose characters occupy different amounts of horizontal space depending on their shape. *Compare with Monospacing.*
**PULL-DOWN MENU** A menu named by a menu title (word or icon) in the Menu bar. When you press a menu title, its pull-down menu appears.

**PURGE** For memory, the emptying of a previously allocated RAM block so that the memory block is free to do other work.

**PUZZLE** A desk accessory included with the Macintosh operating system software that lets you play a game.

**QUIT** The command that removes an application and all of its associated files from RAM. Compare with Close and Open.

**RAGGED** In word processing, text that has an uneven or jagged edge.

**RAM SWAPPING** Exchanging different code segments in and out of RAM to allow large applications and documents to operate with smaller RAM allocations.

**RAM** The abbreviation for Random Access Memory.

**RANDOM ACCESS MEMORY** Electronic circuits or chips where the central processing unit can access individual pieces of information randomly (not in sequence).

**RANGE** A rectangular group of worksheet cells.

**RANGE REFERENCE** The location of a particular range, specifying its beginning and ending cell reference, such as A6:D12 in Excel. (Some programs, such as Lotus 1-2-3 and ClarisWorks, use two periods between the range in place of a colon, such as A6..D12.)

**RASTER** A pattern of horizontal scanning lines on a television or computer screen.

**RASTER GRAPHICS** Another term for bit-mapped graphics.

**READ** To copy an exact replica of a file or file segment from storage into RAM. Compare with Write.

**RECORD** In a database, all the information about a specific person, place, or thing.

**RELATIVE REFERENCE** The automatic adjustment of a spreadsheet's cell references when a formula is copied or moved to another location. Compare with Absolute Reference.

**REPAGINATE** Page break adjustment that occurs when document size changes.

**REPEAT KEY** A keyboard key that continues to input its character as long as the key is pressed. Most keyboard keys are repeat keys.

**REPETITIVE STRAIN INJURIES** Injuries that occur when nearly identical actions are repeated at a high rate of speed over a long period of time. Examples are carpal tunnel syndrome and tendonitis.

**REPLACE** Substitute one item, such as a file or a text block, with another.

**REPORT** In a database, the displayed or printed list of all the records that match specific criteria.

**RESOLUTION** The number of dots per inch either displayed on screen or printed.

**RETRACT** To make smaller or to hide contents, as in a folder. Compare with Expand.

**RETRIEVE** To read a file.

**RIBBON** A row of MS Word buttons that format characters, indicate character format settings, and perform other functions.

**RIGHT ALIGNED** Paragraphs, cells, or text blocks whose contents are formatted to line up straight against their right boundaries, with ragged left edges.
ROW A horizontal line of spreadsheet cells.

ROW HEADING The identifying number to the left of each spreadsheet row, ranging from 1-16,384 in Excel.

RULER A row of MS Word buttons that format paragraphs and indicate their format settings.

SAVE To write a file. The Macintosh Save command can either write a new file, or update an existing one.

SCRAPBOOK A desk accessory included with the Macintosh operating system software that lets you paste and store frequently used text and images for later use.

SCRAPBOOK FILE The file that stores the catalog of graphic and text elements displayed by the Scrapbook desk accessory.

SCREEN PAGE The part of a document that is displayed in its window.

SCREEN SAVER A program that blanks or creates moving images automatically on your screen when the computer screen doesn’t change for a set period of time. Screen savers prevent images from burning into the screen phosphors.

SCRIPT A particular command sequence, often user-definable.

SCROLL ARROWS Scroll bar control buttons that change the window view when clicked or pressed.

SCROLL BARS Controls that let you move from one area of a document or Desktop window to another. Most windows have two scroll bars, horizontal and vertical.

SCROLL BOX White square within the scroll bar that indicates the window’s position relative to the document as a whole. A scroll box can be dragged along the scroll bar to move directly to a specific part of a document or Desktop view.

SEARCH The examination of a disk or a file to locate data that match specific criteria.

SECTOR An arc-shaped disk storage unit.

SELECT To identify an on-screen object, such as an icon or a block of text, so that it can be operated or changed. Usually, selected objects are highlighted.

SELF-TEST The first part of the startup process, in which the computer checks its CPU, its ROM, and its RAM.

SHIFT CLICK Holding down (Shift) as you click the mouse button.

SIMM Abbreviation for single in-line memory module. A RAM chip.

SIZE For a file, the storage measurement that specifies the amount of bytes, kilobytes, or megabytes that file occupies on disk.

SIZE BOX The box in the lower-right corner of a resizable window. Dragging the size box resizes the window.

SMART QUOTES See Curly Quotes.

SOFT RETURN The automatic line return that the word processing program generates when you type past the right margin. See Word Wrap and Hard Return.

SOFTWARE Computer instructions stored on a disk that direct the computer to perform specific tasks. Often divided into two or three functional categories: application programs, operating system software, and utility programs.

SORT The arrangement of data in a specified order, such as alphabetically or numerically.
SOUND FILE The storage of a digitally recorded series of audio snapshots.

SPELL CHECKER An application program feature that checks for the correct spelling of document words against an online dictionary.

SPLIT BOX The rectangle in some document windows that can be dragged to divide that window into panes.

STANDARD TIME Time according to a 12-hour clock. Compare with Military Time.

STARTUP The automatic routine that occurs when you turn on a computer. The process by which a computer checks its hardware and loads its operating system software.

STARTUP DISK The storage medium that contains the operating system software.

STARTUP ICON The icon of the startup disk, usually found in the Desktop’s upper-right corner.

STARTUP SCREEN The screen the Macintosh displays while it starts up.

STATIONERY A pattern or template document that can contain graphics, repeated text, and formatting specifications. Macintosh stationery files open as an untitled replica of the preserved original file.

STATUS AREA An area on the computer screen where some application programs provide setting and command information, such as the page number of the currently displayed passage, or whether the (Caps Lock) or (Num Lock) keys are active. Sometimes called the Status Bar.

STATUS BAR See Status Area.

STORAGE The retention of program instructions, data, and processed information from one computing session to another.

STORAGE DEVICE A device that can read and write data to and from a storage medium.

STORAGE MEDIUM A material that is capable of retaining data and instructions without electrical power.

STRING A series of alphanumeric characters.

SUBSCRIPT Text that is positioned below the main line of text.

SUPERSCRIPT Text that is positioned above the main line of text.

SURGE PROTECTOR A device that helps to protect electronic equipment from potentially harmful fluctuations in electrical power. See also Power Surge.

SYMBOL FONT A symbol font has no standard characters. When you press an alphanumeric key, the symbol font produces an image or picture, such as **A in Zapf Dingbats.

SYSTEM FILE The part of the Macintosh operating system that helps the computer to start up and provides a bridge to the rest of the system software.

SYSTEM FOLDER The distinctive folder that contains the Macintosh’s operating system software.

SYSTEM SOFTWARE See Operating System Software.

TABLE A word processing feature that facilitates the arrangement of columns of text, numbers, and graphics.

TABS Position sets within a document’s margins that align text.
TALL  Document orientation in which pages are printed so that they are taller than they are wide. Also called Portrait orientation. Contrast with Wide or Landscape.

TEMPLATE  See Stationery.

TESTING THE WORKSHEET  Spot-checking worksheet calculations by hand or calculator to verify that formulas give anticipated results.

TEXT  The words, numbers, and other symbols that make up written documents.

TEXT AREA  The main part of a word processing document, the text within the margins.

TEXT BLOCK  A contiguous range of characters. A selected text block highlights on screen.

TITLE BAR  The bar at the top of a window that displays its name, indicates whether the window is active, and if so, displays the window's close and zoom boxes.

TOGGLE KEYS  Keyboard keys whose function switches on or off each time the key is pressed, such as the [Num Lock] or [Caps Lock] key.

TOOL  Used inconsistently by different programs to refer to a specific application type, such as the word processing tool, or to a specific command associated with a specific button, such as the Chart Wizard or the Bold tool.

TOOL PALETTE  A window or part of a window that contains buttons organized by function to make a program easier to use.

TOOLBAR  A screen area containing a group of buttons used in some application programs, such as MS Word and Excel.

TOP-DOWN DESIGN  A structured approach to problem-solving that begins with stating the general problem, and then breaks down the solution of that problem into increasingly more specific increments until the problem is solvable.

TRACK  A single concentric ring on a disk's surface.

TRASH  The special Desktop icon where you place items you wish to delete from storage.

TRUNCATED  Chopped off. File or folder names longer than 15 characters may be truncated in dialog box lists, with the truncated characters replaced by ellipses, . . .

TYPE STYLE  Modification of a character's appearance such as bolded, italicized, or underlined.

UNDO  The command that lets you reverse your very last step, at least most of the time.

UNLOCK  To make a disk or file modifiable.

UNTITLED  The name the Macintosh Finder gives a new folder, disk, or file icon.

UPGRADE  1) A new software version, allegedly with improvements and enhancements compared with the previous version. 2) A hardware improvement, such as an increase in total memory, or the change to a faster microprocessor.

USER  A person who operates or uses the computer system. Also known as an End User.

VALUE  Numeric data that can be manipulated mathematically. Compare with Label.

VECTOR GRAPHICS  Another term for Object-oriented Graphics.

VERIFICATION  The process of controlling data for accuracy.
VERIFY To check that everything is OK.

VIEW FORMAT One of seven ways in which a Desktop window can display its contents.

VIRTUAL MEMORY Extending application memory by swapping program and document segments between RAM and the hard disk in the background to provide large programs and documents with an extra place to put code segments during operation. Virtual memory is disk space pretending to be RAM; available, but slow.

WHAT IF? Projection. Making informed guesses as to the values of unknown figures over a set period of time.

WIDE Document orientation in which pages are printed so that they are wider than they are tall. Also called Landscape orientation. Contrast with Tall or Portrait.

WINDOW A rectangular area on screen in which you can see and work with information, such as the contents of a particular Desktop icon or a specific word processing document.

WORD PROCESSING APPLICATION A software program that allows a computer to create and to manipulate text.

WORD PROCESSOR A sophisticated text creation and manipulation tool.

WORD WRAP As you enter text, the word processing program automatically wraps words down to the next line if they go past the right margin. With word wrap, you should not press Return at the end of each line, only at the end of a paragraph. See also Paragraph, Computer.

WORKSHEET The spreadsheet document, a computerized matrix of cells arranged in lettered columns and numbered rows.

WRITE To copy an exact replica of something from RAM into storage. Compare with Read.

ZOOM BOX The box in the right corner of a window's title bar that you can click to alternate between two different window sizes, the current size (zoom in) and the optimal size (zoom out).
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# Quick Reference

## General Commands

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<th><strong>Menu</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>🍎 / About</td>
<td>Displays an information box about the active application</td>
</tr>
<tr>
<td>🌟 / Chooser</td>
<td>Displays the Chooser dialog box to set printers, modems, and networks</td>
</tr>
</tbody>
</table>

### File Menu

<table>
<thead>
<tr>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Finder active: displays total memory and its current allocations</td>
</tr>
<tr>
<td>Displays the Chooser dialog box to set printers, modems, and networks</td>
</tr>
</tbody>
</table>

#### Keyboard

<table>
<thead>
<tr>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Finder active: creates an empty, untitled folder in the active window or on the Desktop if no window is active</td>
</tr>
<tr>
<td>Other applications: creates a new document, displays its window</td>
</tr>
</tbody>
</table>

#### Mouse

<table>
<thead>
<tr>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reads selected icon’s contents into RAM and displays its window</td>
</tr>
<tr>
<td>Closes the icon’s window and removes its contents from RAM</td>
</tr>
<tr>
<td>Displays the Page Setup dialog box to configure a document’s printed pages</td>
</tr>
<tr>
<td>Displays the Print dialog box to print a document</td>
</tr>
</tbody>
</table>

### Edit Menu

<table>
<thead>
<tr>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Reverses the previous command</td>
</tr>
<tr>
<td>Duplicates selection into Clipboard, but removes it from the original</td>
</tr>
<tr>
<td>Duplicates selection into Clipboard without altering the original</td>
</tr>
<tr>
<td>Duplicates Clipboard’s contents at insertion point or selection location</td>
</tr>
<tr>
<td>Removes selected text or graphics without storing the selection on the Clipboard</td>
</tr>
<tr>
<td>Selects all items, text, and graphics in the active window</td>
</tr>
</tbody>
</table>

### Menu

<table>
<thead>
<tr>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Turns on Balloon Help</td>
</tr>
<tr>
<td>Turns off Balloon Help</td>
</tr>
</tbody>
</table>
### Finder (Desktop)

<table>
<thead>
<tr>
<th><strong>File Menu</strong></th>
<th><strong>Keyboard</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>File/Get Info</td>
<td>⌘ I</td>
<td>Displays an information box about the selected item</td>
</tr>
<tr>
<td>File/Duplicate</td>
<td>⌘ D</td>
<td>Replicates the selected icon and its contents and adds the word <em>copy</em> to the end of the duplicate's name</td>
</tr>
<tr>
<td>File/Mak e Alias</td>
<td></td>
<td>Creates a duplicate of the selected icon that can find and open its original</td>
</tr>
<tr>
<td>File/Put Away</td>
<td>⌘ Y</td>
<td>Moves a selected file or folder icon from the Trash or Desktop to a previous location</td>
</tr>
<tr>
<td>File/Find</td>
<td>⌘ F</td>
<td>Dismounts and ejects a selected floppy disk</td>
</tr>
<tr>
<td>File/Find Again</td>
<td>⌘ G</td>
<td>Displays Find dialog box to set search criteria, locate the first matching item, and display it</td>
</tr>
<tr>
<td>File/Print Window</td>
<td>⌘ C</td>
<td>Repeats the Find to locate and display the next matching item</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Edit Menu</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit/Show Clipboard</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>View Menu</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>View/by Small Icon</td>
<td>Displays items in the active window in small icon view</td>
</tr>
<tr>
<td>View/by Icon</td>
<td>Displays items in the active window in large icon view (the default)</td>
</tr>
<tr>
<td>View/by Name</td>
<td>Lists items in the active window in ascending ASCII alphabetical order</td>
</tr>
<tr>
<td>View/by Size</td>
<td>Lists items in the active window by size, from largest to smallest</td>
</tr>
<tr>
<td>View/by Kind</td>
<td>Lists items in the active window by icon type: applications first, documents second, folders last</td>
</tr>
<tr>
<td>View/by Date</td>
<td>Lists items in the active window by date, from most recently modified to least recently modified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Special Menu</strong></th>
<th><strong>Keyboard</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Special/Clean Up Window</td>
<td></td>
<td>Arranges a window’s items one at a time according to the invisible grid</td>
</tr>
<tr>
<td>Special/Clean Up by Name</td>
<td>⌘ O</td>
<td>Arranges a window’s icons all at once in ASCII alphabetical order according to the invisible grid</td>
</tr>
<tr>
<td>Special/Empty Trash</td>
<td>⌘ E</td>
<td>Permanently deletes any items in the Trash from storage</td>
</tr>
<tr>
<td>Special/Eject Disk</td>
<td>⌘ E</td>
<td>Removes a floppy disk from the disk drive without dismounting</td>
</tr>
<tr>
<td>Special/Erase Disk</td>
<td>⌘ E</td>
<td>Erases and re-initializes the selected disk, removing all its contents</td>
</tr>
<tr>
<td>Special/Restart</td>
<td>⌘ R</td>
<td>Quits open programs, ejects disks, and restarts the computer</td>
</tr>
<tr>
<td>Special/Shut Down</td>
<td>⌘ Shift O</td>
<td>Quits open programs, ejects disks, and prepares the computer to be turned off</td>
</tr>
</tbody>
</table>
### MS Word & Excel Commands

<table>
<thead>
<tr>
<th><strong>File Menu</strong></th>
<th><strong>Keyboard</strong></th>
<th><strong>Button</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>File/Save</td>
<td>⌘ S</td>
<td>![Save Icon]</td>
<td>Updates changes to a previously saved file, or displays the Save As dialog box</td>
</tr>
<tr>
<td>File/Save As</td>
<td>⌘ Shift F8</td>
<td>![Save As Icon]</td>
<td>Displays the Save As dialog box: sets storage location, name, and saves a document file</td>
</tr>
<tr>
<td>File/Print Preview</td>
<td>⌘ Option I</td>
<td>![Print Preview Icon]</td>
<td>Displays one–two pages in reduced size as they will appear when printed</td>
</tr>
<tr>
<td>File/Quit</td>
<td>⌘ Q</td>
<td>![Quit Icon]</td>
<td>Removes the application and associated documents from RAM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Various locations</strong></th>
<th><strong>Keyboard</strong></th>
<th><strong>Button</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>⌘ B</td>
<td>![Bold Icon]</td>
<td>Bolds highlighted text</td>
</tr>
<tr>
<td></td>
<td>⌘ I</td>
<td>![Italic Icon]</td>
<td>Italicizes highlighted text</td>
</tr>
<tr>
<td></td>
<td>⌘ U</td>
<td>![Underline Icon]</td>
<td>Underlines highlighted text</td>
</tr>
<tr>
<td></td>
<td>⌘ Shift L</td>
<td>![Left Align Icon]</td>
<td>Left aligns highlighted text</td>
</tr>
<tr>
<td></td>
<td>⌘ Shift C</td>
<td>![Center Align Icon]</td>
<td>Center aligns highlighted text</td>
</tr>
<tr>
<td></td>
<td>⌘ Shift R</td>
<td>![Right Align Icon]</td>
<td>Right aligns highlighted text</td>
</tr>
<tr>
<td></td>
<td>⌘ Shift C</td>
<td>![Increase Font Size Icon]</td>
<td>Increases font size</td>
</tr>
<tr>
<td></td>
<td>⌘ Shift C</td>
<td>![Decrease Font Size Icon]</td>
<td>Decreases font size</td>
</tr>
</tbody>
</table>

### MS Word Commands

<table>
<thead>
<tr>
<th><strong>Edit Menu</strong></th>
<th><strong>Keyboard</strong></th>
<th><strong>Button</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Edit/Find</td>
<td>⌘ F</td>
<td>![Find Icon]</td>
<td>Searches the active document for words, special characters, formats, or styles</td>
</tr>
<tr>
<td>Edit/Replace</td>
<td>⌘ H</td>
<td>![Replace Icon]</td>
<td>Searches the active document for words, special characters, formats, or styles and replaces them with new text and/or formats</td>
</tr>
<tr>
<td>Edit/Go To</td>
<td>⌘ G</td>
<td>![Go To Icon]</td>
<td>Moves the displayed part of document to the specified page</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>View Menu</strong></th>
<th><strong>Keyboard</strong></th>
<th><strong>Button</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>View/Ribbon</td>
<td>⌘ Option R</td>
<td>![Ribbon Icon]</td>
<td>Toggles to hide or display the Ribbon</td>
</tr>
<tr>
<td>View/Ruler</td>
<td>⌘ R</td>
<td>![Ruler Icon]</td>
<td>Toggles to hide or display the Ruler</td>
</tr>
<tr>
<td>View/Toolbar</td>
<td>⌘ R</td>
<td>![Toolbar Icon]</td>
<td>Toggles to hide or display the Toolbar</td>
</tr>
<tr>
<td>View/Hide/Show</td>
<td>⌘ J</td>
<td>![Hide/Show Icon]</td>
<td>Toggles to hide or display nonprinting characters such as spaces, tabs, and returns</td>
</tr>
<tr>
<td>View/Header</td>
<td></td>
<td>![Header Icon]</td>
<td>Opens the Header window</td>
</tr>
<tr>
<td>View/Footer</td>
<td></td>
<td>![Footer Icon]</td>
<td>Opens the Footer window</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Format Menu</strong></th>
<th><strong>Keyboard</strong></th>
<th><strong>Result</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Format/Character</td>
<td>⌘ D</td>
<td>Displays the Character dialog box to change formats such as color, spacing, size, and design of selected text characters</td>
</tr>
<tr>
<td>Format/Paragraph</td>
<td>⌘ M</td>
<td>Displays the Paragraph dialog box to change line spacing, alignment, indents, and tab stops of selected paragraphs</td>
</tr>
<tr>
<td>Format/Document</td>
<td>⌘ F14</td>
<td>Displays the Document dialog box to change settings affecting the whole document such as margins, starting page number, and footnote placement</td>
</tr>
</tbody>
</table>
Tools Menu
Tools/Spelling
Tools/Grammar

Keyboard

Result
Checks a document or selected text for spelling errors
Checks a document or selected text for grammatical errors

Excel Commands

Edit Menu
Edit/Delete
Edit/Insert

Keyboard

Result
Delete a row, column, or selected cells
Inserts a row, column, or selected cells

Formula Menu
Formula/Paste Function
Formula/Goto

Keyboard

Result
Lists Excel's built-in functions to select a function and place it in the formula bar
Selects specified cells

Format Menu
Format/Number
Format/Alignment
Format/Font
Format/Border
Format/Column Width

Result
Displays the Number dialog box to change number or text format of selected cells
Displays the Alignment dialog box to change alignment, orientation, or text wrap
Displays the Font dialog box to change the font of selected cells
Displays the Border dialog box to change the border of selected cells
Displays the Column Width dialog box to change column width or set Best Fit

Data Menu
Data/Form
Data/Find
Data/Extract
Data/Set Database
Data/Set Criteria
Data/Set Extract
Data/Sort

Keyboard

Result
Displays the Form window in which to find, change, or delete database records
Displays the first record that matches search criteria
Copies those records that match search criteria to selected (extract) range
Defines the selected range as a database (only one per worksheet)
Defines the selected cells as criteria to be matched
Defines the selected cells as extract range
Sorts the selected cells

Options Menu
Options/Set Print Area
Options/Toolbars

Result
Indicates the range of cells to print
To remove, select the entire worksheet and choose Options/Remove Print Area
Shows or hides specific Toolbars

Window Menu
Window/Split
Window/Remove Split

Result
Splits the active worksheet window into panes
Removes split panes
General Concepts
Understanding Information Systems
Steven C. Ross

Operating Systems and Environments
Understanding and Using Microsoft Windows 3
Steven C. Ross and Ronald W. Maestas
Understanding and Using Microsoft Windows 3.1
Steven C. Ross and Ronald W. Maestas
Understanding and Using MS-DOS/PC DOS 5.0
Jonathan P. Bacon
Understanding and Using MS-DOS 6.0
Jonathan P. Bacon

Word Processors
Understanding and Using WordPerfect for Windows
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Larry Lozuk and Emily M. Ketcham
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Understanding and Using WordPerfect 6.0
Jonathan P. Bacon
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John R. Nicholson

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Steven C. Ross and Stephen V. Hutson
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Steven C. Ross and Alan H. Bauld
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Steven C. Ross

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Steven C. Ross

Understanding and Using Lotus 1-2-3 Release 3
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Steven C. Ross and Stephen V. Hutson
Understanding and Using Lotus 1-2-3: Advanced Techniques
Releases 2.2 and 2.3
Judith C. Simon

Databases
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Bruce J. McLaren
Understanding and Using Paradox for Windows
Larry D. Smith
Understanding and Using Paradox 3.5
Larry D. Smith
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Steven C. Ross
Understanding and Using dBASE IV
Steven C. Ross

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Gary Bitter
Understanding and Using Microsoft Works 3.0 on the Macintosh
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Understanding and Using Microsoft Works 2.0 on the Macintosh
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Steven C. Ross, Jonathan P. Bacon, and Cody T. Copeland

Essentials of Application Software Volume 1: DOS, WordPerfect
5.0/5.1, Lotus 1-2-3 Release 2.2, dBASE III PLUS
Steven C. Ross, Jonathan P. Bacon, and Cody T. Copeland

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