

PROJECTS

PROJECT 6-1

Operating systems can be classified as follows: multiuser, multiprocessing, multitasking, multithreading, and real-time. Use the Internet to find information regarding these types of operating systems. Then complete the following list by writing a sentence or two describing each type.

- Multiuser:
- Multiprocessing:
- Multitasking:
- Multithreading:
- Real-time:

PROJECT 6-3

You are part of a team writing the program for an interactive children's game. The object of the game is similar to the poem Jack and Jill. (See www.poetryfoundation.org/poem/176353 for the complete text.) Your part is to develop the basic flowchart or algorithm for the poem. Complete the following:

1. Identify the steps in the poem.
2. Using the algorithm shown in Figure 6-3 or the flowchart shown in Figure 6-4, write or sketch the steps of the poem.

CRITICAL THINKING

As mentioned in this lesson, software piracy is the unauthorized copying of software. Assume that your responsibility is to protect your organization from software piracy. Access the Microsoft Protect Yourself from Piracy Web site at www.microsoft.com/piracy and the Webopedia software piracy definition page at www.webopedia.com/TERM/S/software_piracy.html. Review the

ONLINE DISCOVERY

Open source, freeware, and shareware are three categories of software described in this lesson. Complete the following:

1. Use the Internet and Web sites such as download.cnet.com, directory.fsf.org, and freewarefiles.com to find a minimum of two examples of software in each category.

JOB SKILLS

Computer software engineer is one of the occupations projected to grow the fastest and add the most new jobs during the current decade. You are considering a career as a software engineer and want to learn more about this profession. Using the Internet and

PROJECT 6-2

Webopedia provides a complete overview of an operating system. Access this Web site located at www.webopedia.com/TERM/O/operating_system.html. Review the information and then write a summary about operating systems, using your Webopedia research and the information contained in your textbook.

TEAMWORK PROJECT

You and two team members have been asked to create a proposal to purchase equipment for a new computer lab for your classroom. Your job is to determine the operating system, the distribution method you will use for software access, and the minimum number of applications you need to accomplish the goals of your computer literacy course. Describe the operating system you will use and explain why your team selected it. Research the distribution method and applications you need, and then organize your findings into a one-page report and a presentation to present to your class.

information contained on both of these sites, and then write a report describing these terms: *copy-protecting*, *shareware*, *OEM unbundling*, *counterfeit software*, and *Certificate of Authenticity (COA)*. Describe the approach you would use to protect your organization's software.

2. Use your word processing program and create a table listing the name of the software program, the Web site address, a short description, and the software category.



1-2.1.2



1-2.1.3



1-2.1.3



1-2.1.3

LESSON 7

Software Fundamentals

 Estimated Time:
1.5 hours

OBJECTIVES

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

- Use word-processing software.
- Work with spreadsheet software.
- Work with presentation software.
- Use database software.
- Work with graphics and multimedia software.
- Use other types of software, including education, entertainment, utility, and miscellaneous programs.
- Select the right software for the task.
- Integrate software.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

bitmapped graphics
cell
database
datasheet
field
multimedia
object
object linking and embedding (OLE)
presentation software
primary key
query
record
table
text editor
utility program
vector graphics
word-processing software
workbook
worksheet

As you learned in Lesson 6, software is divided into two classes: system software and application software. System software consists of low-level programs that interact with the computer at a basic level. Lesson 8 covers system software in detail. Application software (also called end-user software) includes programs such as databases, presentation software, spreadsheets, and word processors. Symbolically speaking, application software sits on top of system software because it cannot run without the operating system and system utilities.

You can purchase application software as individual programs or as a suite. Software suites are groups of related programs that interact nearly seamlessly with each other to make certain tasks easier. A suite generally contains the following four types of programs: word processing, spreadsheet, presentation, and database. Some of the more popular suites are Apple iWork, Corel WordPerfect Office, Google Docs, Microsoft Office, Microsoft Works, and Oracle OpenOffice. Some suites, however, do not include a database program, while others contain add-ons such as Talk (instant messaging) and Calendar (appointment tracking), both part of Google Docs.



VOCABULARY

word-processing software

Using Word-Processing Software

Word-processing software is a widely used type of application. Primarily, you use this software to create, edit, and print documents and then save them electronically. When creating a document, you easily can correct errors and modify data. In most word-processing programs, you can save the document in a variety of formats including a template, Rich Text Format, plain text format, and as files compatible with earlier versions of the program.

Microsoft Word (see **Figure 7-1**), a word-processing program, includes basic and sophisticated features for creating, editing, formatting, and producing documents. For example, it includes collaboration features that allow you to track the changes made by multiple users. Reviewers can insert their comments within a document. These features are very useful, particularly when two or more people are working on the same project or when instructors need to comment on a student's work.

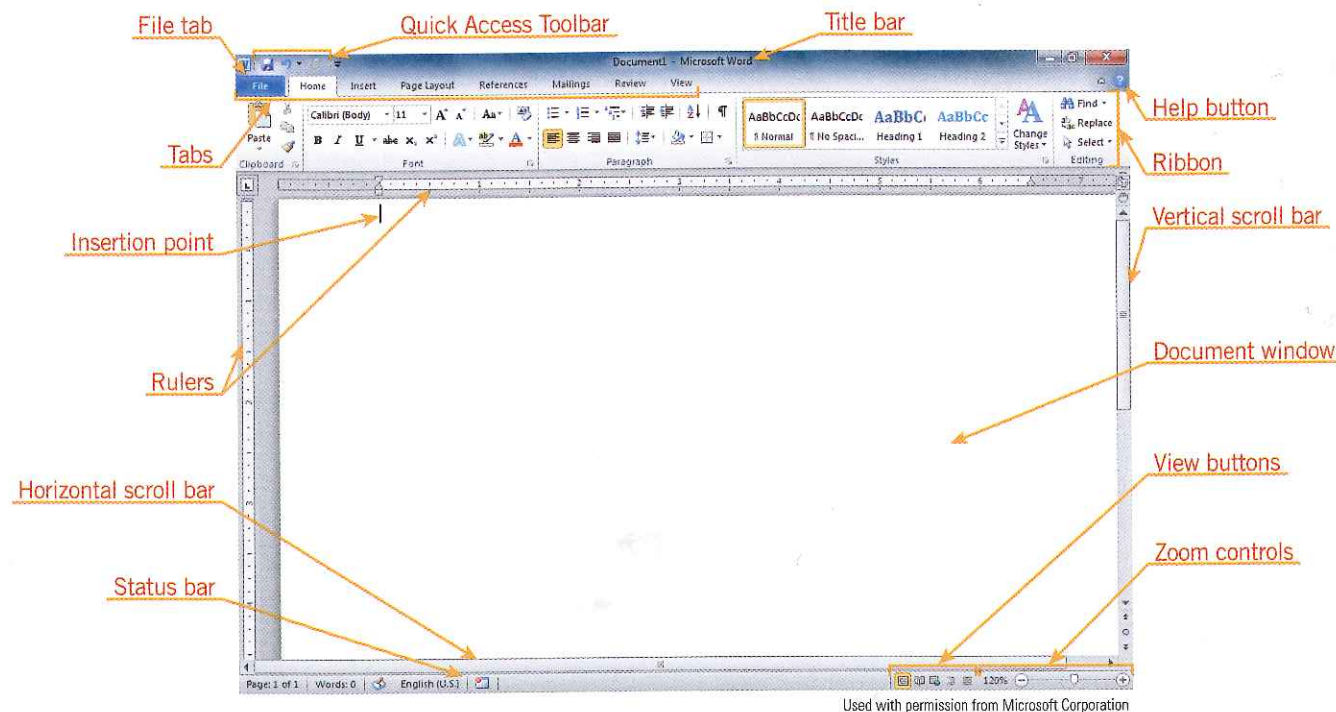


FIGURE 7-1 Word window

Used with permission from Microsoft Corporation

Figure 7-1 shows a blank document opened in Microsoft Word. The following list describes the features displayed in this figure.

- **Document window:** Area where you type and work with a document.
- **Help button:** Opens a new window where you can select or search for Help topics.
- **Horizontal scroll bar:** Moves the page left and right if the page is too wide to fit in the document window.
- **File tab:** Opens Backstage view, which contains commands tasks such as opening, saving, and printing documents.
- **Insertion point:** Indicates where characters are entered when you type.
- **Quick Access Toolbar:** Located in the title bar and contains a repository of the most-used functions; fully customizable.
- **Ribbon:** Panels that contain command buttons and icons.
- **Rulers:** Show the positioning of text, tabs, margins, insertion point, and any other elements on the page.
- **Status bar:** Displays the number of the current page and the total number of pages in the document; also indicates the on/off status of Word features such as spelling and grammar checking.
- **Title bar:** Displays the name of the program and the name of the document on which you are working; the default name of a document is DocumentX, where X is a number.
- **Vertical scroll bar:** Moves the page up and down if the page is too long to fit in the document window.
- **View buttons:** Switch among the following views: Print Layout, Full Screen Reading, Web Layout, Outline, and Draft.
- **Zoom controls:** Change the magnification of the document so it appears larger or smaller in the document window.

The following basic features in word-processing programs automate the process of creating and editing professional-quality documents:

- **Accessibility:** Use keyboard shortcuts, size, zoom, color, and sound options.
- **Copy and paste:** Select and then duplicate a section of text.
- **Cut and paste:** Select and cut (delete) a segment of text from one place in a document and then insert or paste it somewhere else within the same document or within another document.
- **Delete:** Select and then delete characters, words, lines, or pages of text.
- **File management:** Access options so you can create, delete, move, save, and search for files.
- **Font selection:** Apply font size, font type, color, italics, underline, and bold properties to the text.
- **Graphics:** Insert pictures, clip art, shapes, SmartArt, WordArt, and other graphical objects.
- **Page size and size margins:** Define various page sizes and margins; text is readjusted to fit the page.
- **Print:** Send a document to a printer to produce a hard copy.
- **Search and replace:** Search for a particular word or phrase; use replace to substitute a character, word or longer text for specified text within the document.
- **Text insertion:** Insert text anywhere in the document; the inserted text can be copied from another word-processing document, an e-mail message, a Web page, or other document type.

ABOVE AND BEYOND

If your desktop contains a Word icon or an icon for another Microsoft Office program, you can double-click the icon to start the program.

WARNING

As you work in a document, it is a good idea to save it regularly to prevent losing data.

VOCABULARY
text editor

- **Word wrap:** Automatically moves the insertion point to the next line when one line is filled with text; the text is readjusted if the margins are changed.

Word processors that support these basic features generally are called *text editors*, whereas word-processing programs that are more robust support additional features. Some of these more advanced features are as follows:

- **Blogs:** Publish blogs directly from the word-processing program.
- **Footnotes:** Automate the numbering and placement of footnotes.
- **Headers and footers:** Specify custom text and graphics at the top and bottom of a page.
- **Macros:** Save a series of keystrokes that represent a series of commands.
- **Merge:** Merge text from one file into another; useful for generating documents such as mailing labels and then merging them with a form letter.
- **Page numbering:** Number pages in the format and position you specify.
- **Reference tools:** Access reference tools such as a spell checker, dictionary, thesaurus, and language translator.
- **Windows:** Display and edit two or more documents on the same screen.
- **WYSIWYG:** Work with the document on the screen as it will look when printed; stands for “what you see is what you get”.

Microsoft Word also provides other options that you can adjust and configure to suit your working style. You can display these options by clicking the File tab and then clicking the Options button in the left pane. **Figure 7-2** shows an example of options you can modify through the Word Options dialog box. In this figure, the Proofing category is selected.

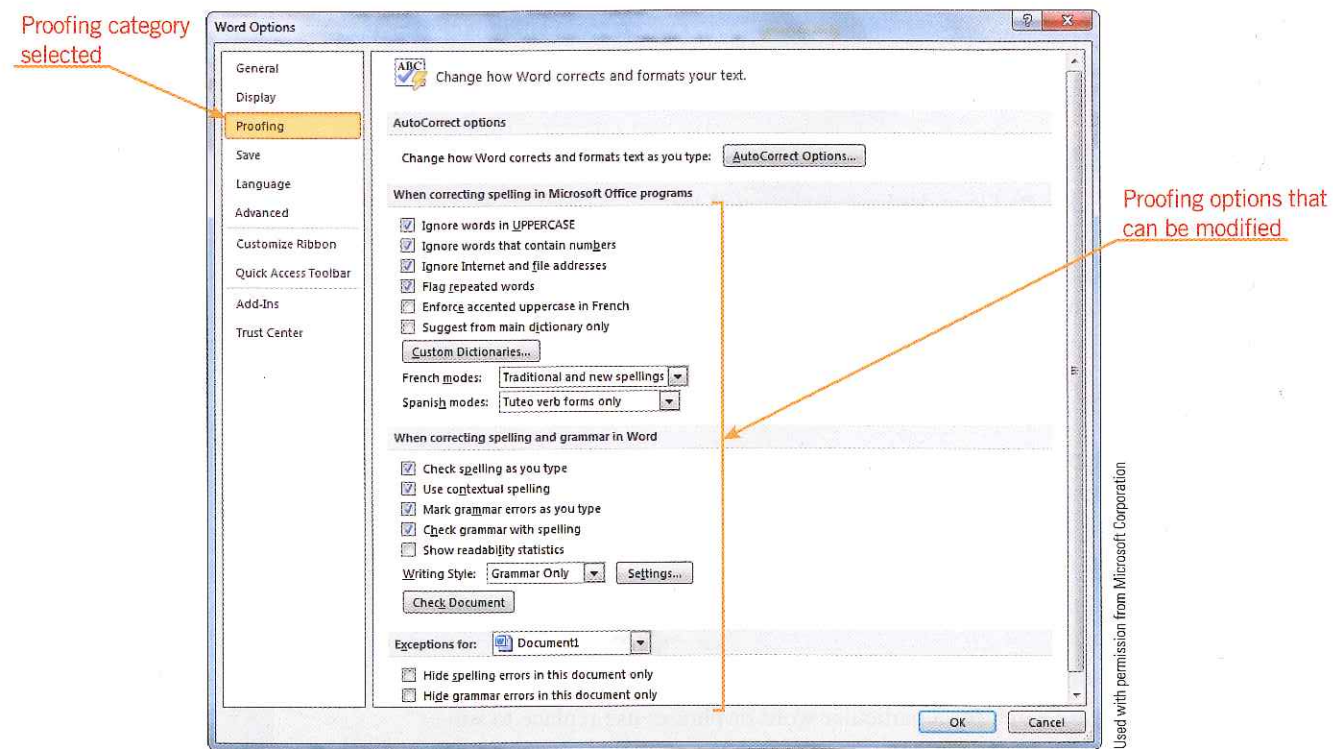


FIGURE 7-2 Word Options dialog box

Working with Spreadsheet Software

A *spreadsheet* is a row-and-column arrangement of data. You use electronic spreadsheet software such as Microsoft Excel to evaluate, calculate, manipulate, analyze, and present numeric data. Calculations are updated automatically, which makes this type of software very effective for tasks such as preparing budgets, financial statements, payrolls, and sales reports, and for managing orders and inventory. You also can use spreadsheet software to make forecasts and identify trends.

A spreadsheet (see **Figure 7-3**) looks much like a page from a financial journal. It is a grid with columns and rows that can contain text, formulas, and numbers (values). This grid in Excel is referred to as a *worksheet*. The terms spreadsheet and worksheet are used interchangeably. When you start Excel, you open a file called a *workbook*. Each new workbook comes with three worksheets, like pages in a document.

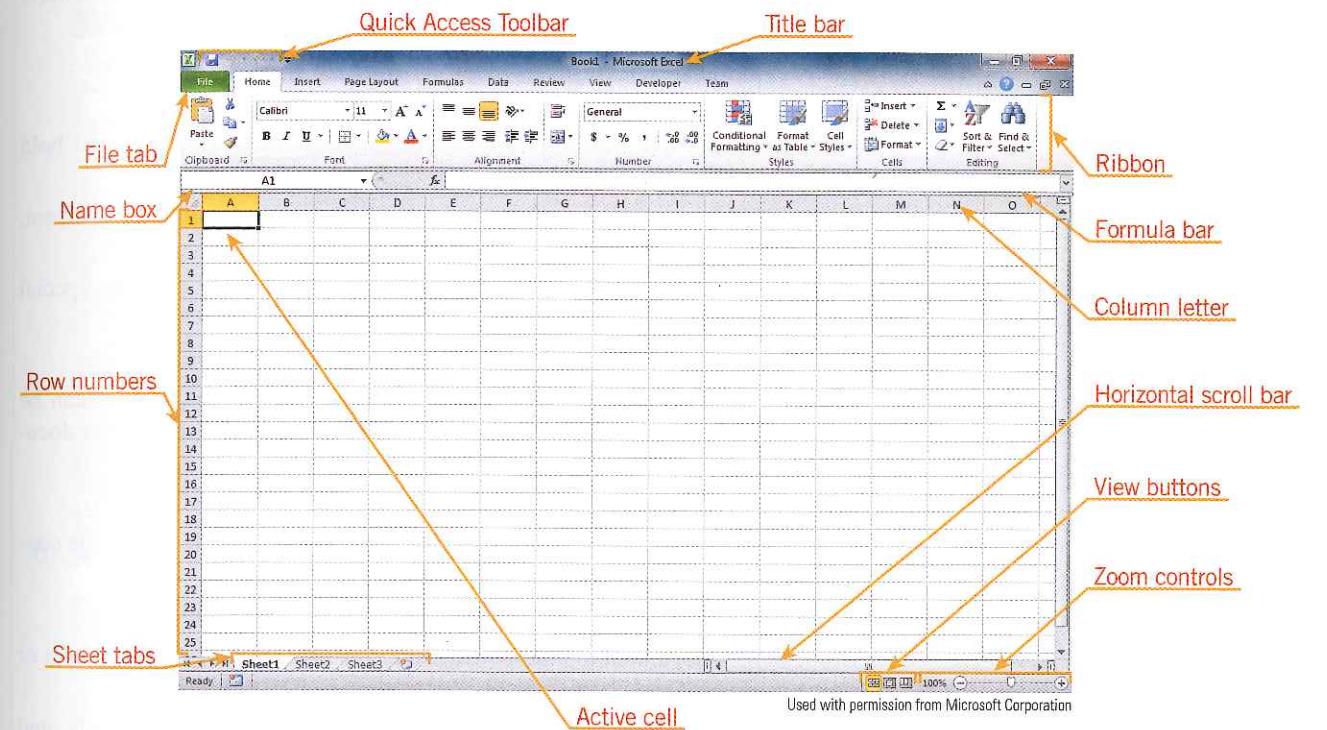


FIGURE 7-3 Excel window

As shown in **Figure 7-3**, the columns are identified by letters and the rows are identified by numbers. The point at which a column and a row intersect or meet is called a *cell*. Each cell has a name, called the cell reference (or cell address), which is represented by the column letter and the row number. For example, the first cell in a worksheet is cell A1. It is located in column A and row 1. The active cell is the cell where you are working and is surrounded by a thick border. Note that cell A1 is the active cell in **Figure 7-3** (as indicated in the Name box) and that 25 rows and the columns A through O are displayed. Some worksheets, however, contain thousands of columns and over a million rows; therefore only a small portion of the worksheet is displayed at one time. Individual worksheets are stored within a workbook. By default, a workbook contains three worksheets named Sheet1, Sheet2, and Sheet3, as shown on the sheet tabs at the bottom of the window. (Sheet is another word for worksheet.)



VOCABULARY
spreadsheet
worksheet
workbook
cell

The basic features supported by most spreadsheet programs are as follows; many of these features are the same as or similar to those contained in word-processing programs:

- **Accessibility:** Use keyboard shortcuts, size, zoom, color, and sound options.
- **Copy and paste:** Select and then duplicate a section of text, formula, number, or other data. When a number or formula is copied from one cell and then pasted into a new cell, the spreadsheet program automatically readjusts the formula based on the new location.
- **Cut and paste:** Select and cut (delete) a segment of text, a number, formula, or other data and then paste (insert) it somewhere else within the same document or another document. If a formula is part of the selection, it is readjusted to apply to the new location.
- **Data filtering:** Locate certain records in a spreadsheet based on selected criteria and then display those selected records.
- **Delete:** Select and then delete numbers, text, formulas, charts, and so on.
- **File management:** Create, delete, move, save, and search for files.
- **Font selection:** Apply font size, font type, color, italics, underline, and bold properties to the data.
- **Formulas:** Use a variety of formulas and functions, including AutoSum, Financial, Logical, Math and Trig, and Statistical functions.
- **Graphics:** Insert illustrations, images, SmartArt diagrams, symbols, special characters, and a variety of graph types into the spreadsheet.
- **Headers and footers:** Specify custom text at the top and bottom of a page.
- **Data entry:** Insert data anywhere in the spreadsheet; the inserted data can be copied from another spreadsheet, an e-mail message, a Web page, or other document type.
- **Macros:** Save a series of keystrokes that represent a series of commands.
- **Merge:** Merge a selection of cells or split merged cells; you can also merge copies of a shared worksheet.
- **Page numbering:** Number pages in the format and position you specify.
- **Print:** Send a document to a printer to produce a hard copy of the worksheet or of the worksheet and chart.
- **Search and replace:** Search for a particular word, phrase, value, formula, and so on; use replace to substitute new data, text, or formulas for others within the document.
- **Reference and editing tools:** Use a variety of built-in editing tools such as a spell checker, thesaurus, grammar checker, and translation tools.
- **Windows:** Display and edit two or more worksheets on the same screen.

The appearance of the spreadsheet is almost as important as the accuracy of the data it contains. You can use formatting to emphasize entries, create a more professional look, and make the information easier to read and understand. In Figure 7-4, you can see how graphics and formatting called cell styles can affect the appearance of the data.

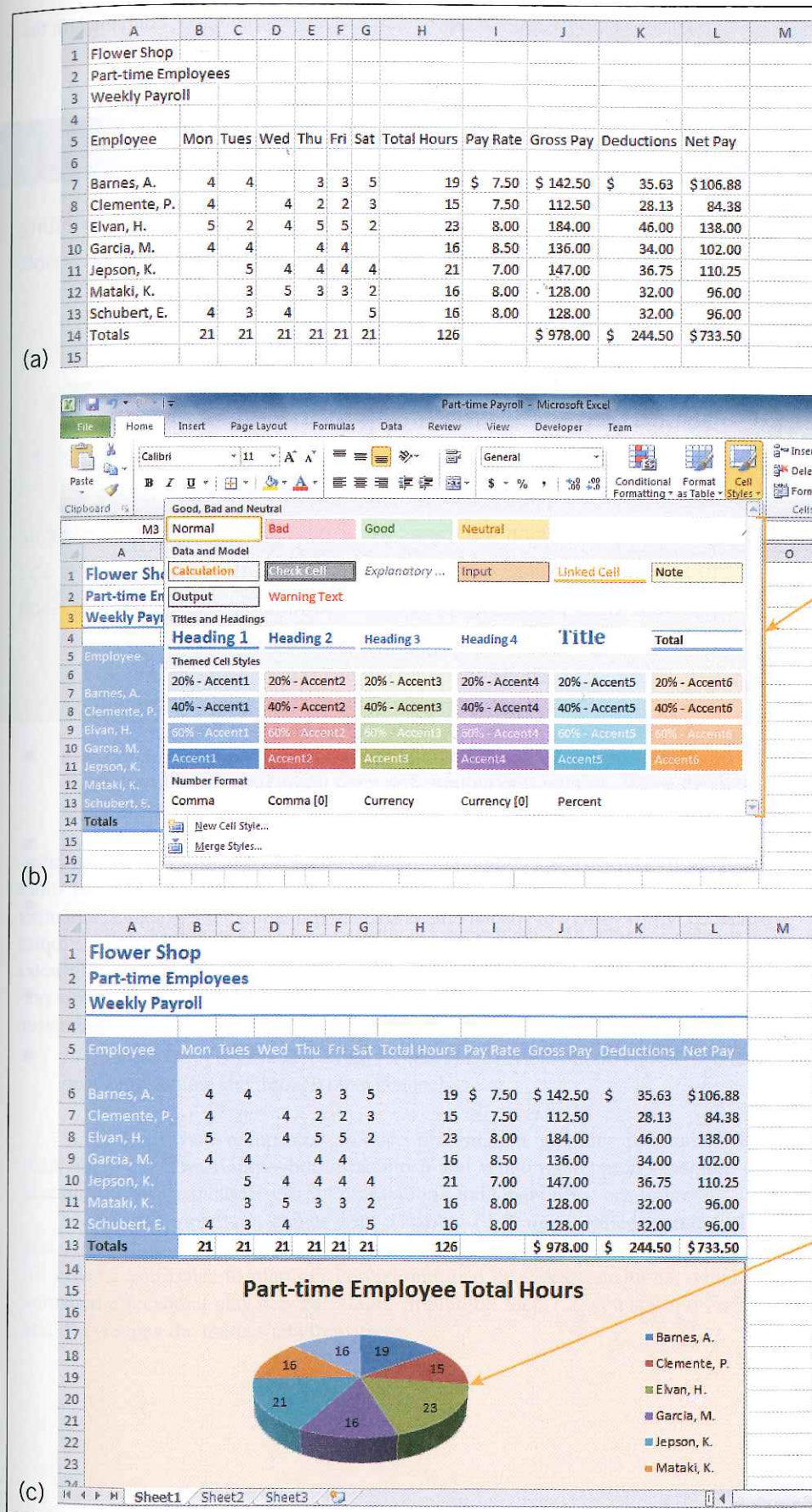


FIGURE 7-4 (a) Unformatted data (b) Cell styles applied (c) Graphic added

Used with permission from Microsoft Corporation

In Step-by-Step 7.1, you start Excel and review the commands contained on the Page Layout tab of the Excel Ribbon.

Step-by-Step 7.1


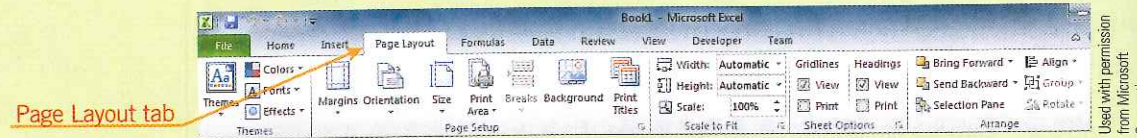
1. Start Excel by clicking the **Start** button  on the taskbar, pointing to *All Programs*, clicking **Microsoft Office**, and then clicking **Microsoft Excel 2010**.
2. Click the **Page Layout** tab on the Ribbon (see **Figure 7-5**).

FIGURE 7-5
Excel Page Layout tab



3. Review the groups on the Page Layout tab: Themes, Page Setup, Scale to Fit, Sheet Options, and Arrange. Click the buttons in each group and use your word-processing program to summarize the purpose of each button. Submit your summary to your instructor.
4. Close all open windows.



Working with Presentation Software

Presentation software is a computer program you use to organize and present information, normally in the form of a slide show. Through the use of sequential slides enhanced with a variety of special effects such as animation, text, graphics, and other features, a presentation is an effective and professional way to communicate topics and ideas. In addition, presentation software provides options for generating notes for the presenter and handouts for the audience. Equipment requirements for the presentation include a projector and computer. Microsoft PowerPoint is the presentation program in the Microsoft Office suite (see **Figure 7-6**).

VOCABULARY presentation software

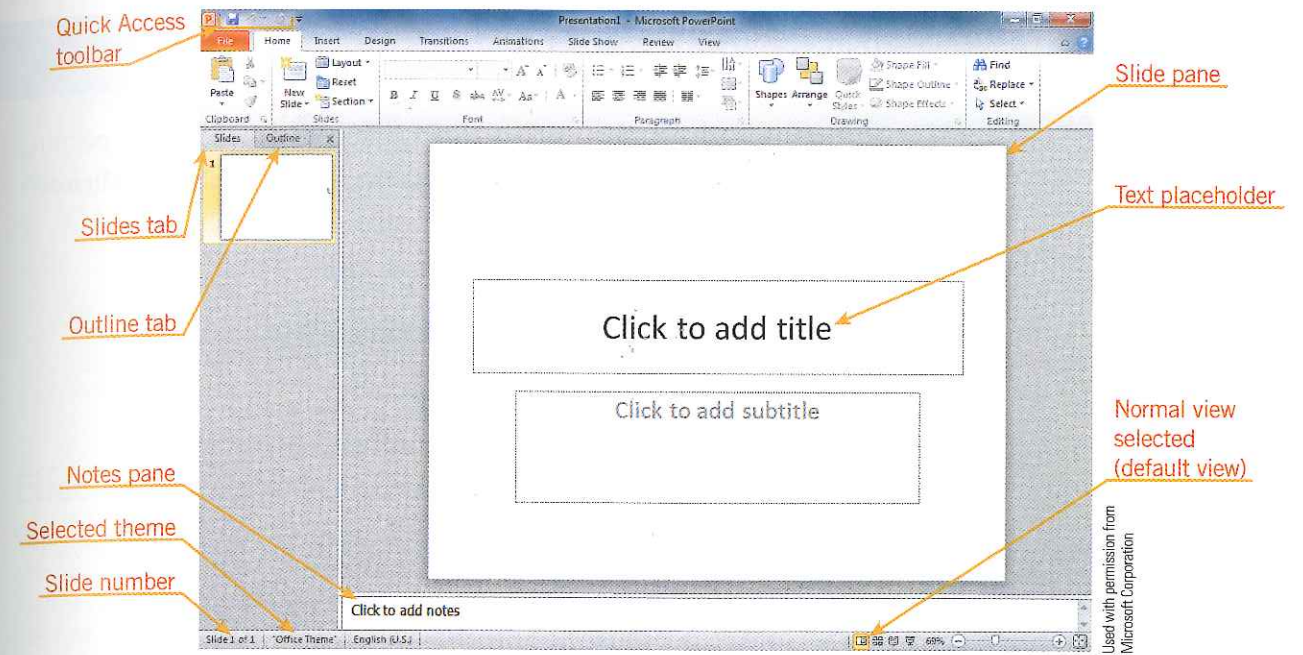


FIGURE 7-6 PowerPoint window

Besides being excellent for creating on-screen shows, presentation software is also useful in the following scenarios:

- **Self-running presentation:** Job fairs, demonstrations, and conventions are a few examples of where you might see a self-running presentation. When the presentation is completed, it automatically restarts.
- **Presentation broadcasting:** You can use the Web to broadcast your presentation to locations all over the world.
- **Overhead transparencies:** If you do not have access to a computer and projector for your presentation, you can create and print black-and-white or color transparencies. This requires using plastic transparency sheets in your printer.
- **Audience handouts:** Printed handouts support your presentation. Smaller versions of your slides can be printed two, three, six, or nine to a page.
- **PDF document:** Portable Document Format (PDF) is a common format for sharing documents online and through other channels.

Several software companies produce presentation graphics programs. Other than Microsoft PowerPoint—both Macintosh and Windows versions—popular presentation software includes Corel Presentations and OpenOffice.org Impress.

Microsoft PowerPoint comes with a variety of designs, called themes, which you can apply to a presentation. A theme is a predesigned set of fonts, colors, lines, fill effects, and other formatting. PowerPoint also provides transitions, which are animated effects that play between slides. In Step-by-Step 7.2, you start PowerPoint and then review the themes and transitions.

Step-by-Step 7.2


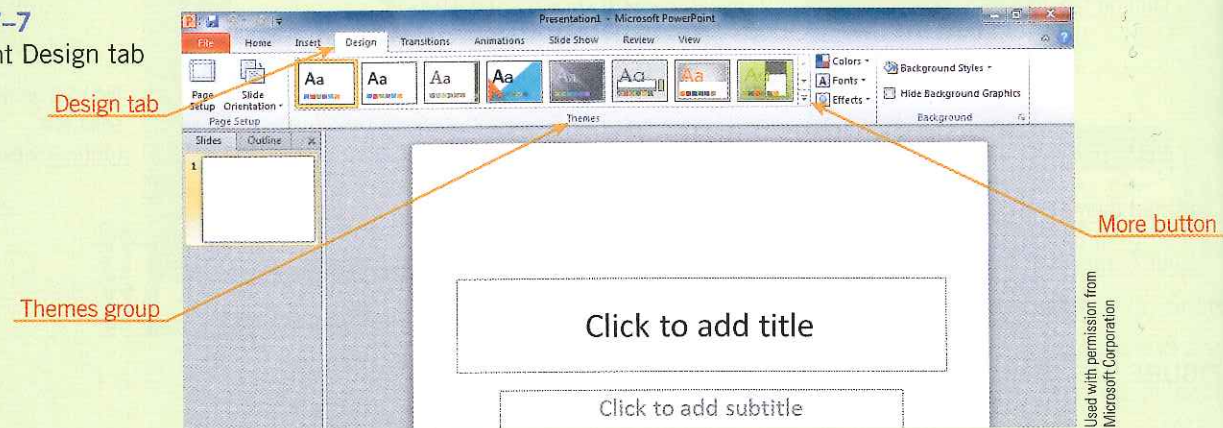
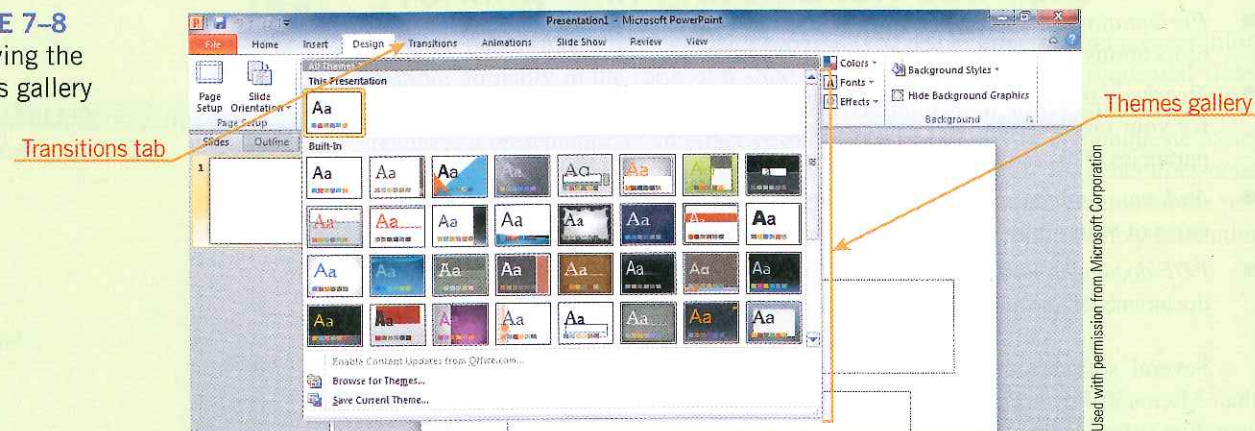
1. Start PowerPoint by clicking the **Start** button  on the taskbar, pointing to *All Programs*, clicking **Microsoft Office**, and then clicking **Microsoft PowerPoint 2010**.
2. Click the **Design** tab on the Ribbon (see **Figure 7-7**).

FIGURE 7-7
PowerPoint Design tab



3. Move the mouse pointer over each theme in the Themes group to display a preview and the name of the theme. Click the **More** button to display additional themes in the Themes gallery (see **Figure 7-8**). Click a theme to apply it to the slide.

FIGURE 7-8
Displaying the Themes gallery



4. Click the **Transitions** tab. Click each of the animated transitions in the Transition to This Slide group to play a preview of the transitions.
5. Click the **More** button in the Transition to This Slide group to display the Transitions gallery.

6. Suppose you need to create a presentation about software fundamentals. Use your word-processing program to answer the following questions:
 - a. Which theme would you select for the presentation and why?
 - b. Which transition would you use and why?
 - c. Would you use the same design and transition on each slide? Why or why not?
 - d. Submit your assignment to your instructor.
7. Close all open windows.

Effective Presentation Guidelines

You can use graphics, transitions, and other tools to make any presentation more effective and interesting. However, be cautious! Presentation programs contain many features and options, so it is sometimes difficult to avoid getting carried away. Often, the first-time user is tempted to add distracting sounds, animations, and excessive clip art to each slide. Before you create a presentation, therefore, you need to plan and outline the message that you want to communicate. As you develop the outline for your presentation, consider your audience and determine the presentation's purpose, the location in which it will be given, and the equipment you will need.

QUICK TIP

Use photos, clip art, and graphics instead of words for a more powerful presentation.

Follow these guidelines to create an effective presentation:

- Cover one topic per slide.
- Keep the text simple—use the “6 by 6 rule,” which is six lines of text, six words per line.
- Use no more than 50 words per slide, including titles and subtitles.

TECHNOLOGY CAREERS

Presentation Expert

Presentations are an organization's most direct communication effort. A good presentation can make a sale, while a bad presentation can prevent a company from landing a contract. As presentations are becoming commonplace, companies are beginning to emphasize the importance of this media.

A growing trend in large companies is to hire a presentation expert to oversee the creation and delivery of presentations within the organization. Depending on the size of the company and the number of presentations required, this person might work alone or as part of a media department. The media department generally functions as a service bureau for the rest of the company. Presentation managers might also be responsible for design. They must stay updated and aware of technological advances in the areas of multimedia. This position often requires additional professional education, such as workshops, conferences, and classes.

Many large companies have a standard set of master slides and templates. All employees are expected to use these standards. The presentation manager might be responsible for creating the masters and templates, and might even be responsible for teaching physical presentation delivery skills or coaching frequent speakers.

Because there are no certifications or degrees for presentation managers, many people employed in this field have graphics design or Web design backgrounds. They might have a four-year degree in a related field such as communications, a two-year degree in design, or a certification that includes design and computer application skills.

- Do not clutter your slide with large paragraphs displayed in a small font size. Use short comments and fill in the details orally.
- Use bullets, not numbers, unless providing specific step-by-step instructions. Bullets indicate no significant order, while numbers indicate rank or sequence.
- Use readable typefaces and fonts, such as those provided in PowerPoint themes.
- Choose color carefully.
- Use simple tables to present numbers.
- Add clip art sparingly and only where appropriate.
- Do not try to dazzle your audience with an overabundance of graphics, sound, transitions, and other effects.



Using Database Software

Effective information management is the core of a successful business and is important in your personal life. Data is unorganized text, graphics, sound, or video. Information is data that has been organized and processed so that it is meaningful and useful. Most people need a method to store data and convert it into accurate, relevant, and timely information when needed.

Database Software Defined

A **database** is a collection of related information organized in a manner that allows for rapid search and retrieval. A database management system (DBMS) is software used to create, maintain, and provide controlled access to data. A table in a database contains the data to organize and is similar to a spreadsheet. Like spreadsheets, database tables are composed of rows and columns. You use both types of software to organize, sort, and calculate data. A database, however, provides additional comprehensive functions for manipulating data. This lesson introduces you to some basic database features for entering, organizing, and reporting data.

Before you begin to design and develop a database, you should do some planning. Consider what data you will include and what information you want to create. After making these decisions, you are ready to begin creating your database.

Database Structure

To use a database program effectively, you first need to understand some basic terminology. In Microsoft Access, a database can consist of one table or a collection of tables. A **table** is composed of columns and rows, referred to as fields and records in Access. **Figure 7-9** shows a sample database table for customers of The Flower Shop. The table is named Customers. The Flower Shop provides wholesale products to florists, so its customers are small flower shop owners or managers.

Contact ID	First Name	Last Name	Company	Title	Address	Phone	E-mail
1	Jerry	Smith	My Flowers	Director	1212 Oak Street	813-555-4412	jsmith@course.myflowers.com
2	Tracy	Coady	USA Floral	Manager	42 E. Highview	904-555-3285	tcoady@course.usa.com
3	Eve	Perry	Perry Floral	Owner	1201 N. 3rd Avenue	813-555-4982	eve@course.perry.net
4	Jessica	Minnick	Flowers to Go	Owner	37 W. Monroe Drive	813-555-3365	jminnick@course.ftg.net
5	John	Jerrigan	Flower Arc	Manager	1900 E. Henry Street	904-555-6211	johnj@course.flowerarc.com

FIGURE 7-9 Records in the Customers table

VOCABULARY

database
table

Parts of the Customers table shown in Figure 7-9 are as follows:

- The rows in the table are called **records**. Each record is a group of related fields, such as all of the information regarding each customer in a customer table.
- The columns in the table are called **fields**. Each field contains a specific piece of information within a record. In the table in Figure 7-9, for example, the Phone field contains the customer's phone number.
- The **primary key**, which is assigned to a field, uniquely identifies each record in a table. It tells the database program how your records are sorted, and it prevents duplicate entries. In Figure 7-9, the primary key is the Contact ID field.

Microsoft Access is one of the most widely used database programs. The Access window is similar to other Microsoft Office 2010 applications in several ways—it displays a title bar, the Ribbon, and a status bar. Unlike Word, Excel, and PowerPoint, however, Access does not have a standard document view. The Access window changes based on the **object** you are using as you work with the database. (An object in Access is a container that you create in the database, such as a table.) Furthermore, many of the Ribbon tabs are unique to Access.

Using the data stored in a table, you can use database software to create queries, forms, and reports. A **query** asks a question about the data stored in the table. The database program searches for and retrieves information from one or more tables to answer the question. You use forms to enter data in a table and reports to print selected data. All of these objects—tables, forms, queries, and reports—are stored in a single file, which is the database.

After you create and save a new database, the next steps are to create fields and then add data to the table. Tables are the primary objects in a database because they contain the data. Most databases contain multiple tables.

Database Tables

Access provides several ways to create a table, including the following:

- Create a new database.
- Add a table to an existing database using the Tables group on the Create tab.
- Create a table by selecting a table template using the Application Parts button in the Templates group on the Create tab.

Creating a table is the first step in a three-step process; adding fields is the second step. The third step is to populate or add records to the table. When editing or adding records to a table, you can create and use a form or use Datasheet view. Views are formats for displaying and working with Access objects. You can display Access tables in the following views.

- **Design view:** Create a table and assign a primary key. Forms, queries, and reports also have a Design view.
- **Datasheet view:** Display a row-and-column view of the data in tables, where you can enter and edit data. A **datasheet** resembles an Excel worksheet. Forms and queries also have a Datasheet view.

When you enter data in a field, it is called an entry. To move from one field to another, you can use the mouse or the keyboard to navigate in the table.

VOCABULARY

record
field
primary key
object
query
datasheet

Forms

In addition to adding and viewing records in Datasheet view, you can create and use a data-entry form. A form provides a convenient way to enter and view records in a table. When you create a form, you are adding a new object to the database. You can create a form manually or use the Form Wizard. The wizard asks you questions and formats the form according to your preferences.

Queries

A query enables you to locate records that match specified criteria by providing a way for you to ask a question about the information stored in one or more database tables. The database program searches for and retrieves data from the table(s) to answer your question. Microsoft Access provides four query options:

- *Simple Query Wizard*: Creates a select query from the selected fields
- *Crosstab Query Wizard*: Displays data in a spreadsheet format
- *Find Duplicates Query Wizard*: Locates records with duplicate field values
- *Find Unmatched Query Wizard*: Locates records in one table that have no related records in another table

Suppose, for example, that you want to produce a list of all customers within a specified zip code. When you create a query, you determine what fields you want to display in the query results. Often, you only need to see certain fields in the query results instead of all the fields in the table. In a customer list, for instance, you might want only the customer's last name and the zip code displayed. The order in which you select the fields determines the order in which the information is displayed in the query results.

Reports

Another important feature of database management software is the ability to generate sophisticated reports that show the contents of the database. A report is a database object that allows you to organize, summarize, and print all or a portion of the data in a database. You can create a report based on a table or a query. You can decide what formatting you want to use, such as headings, spacing, and graphics. After the report is generated, you can decide which records you want to include in the report, sort the report, and insert a picture in the report.

Although you can produce a report manually, the Report Wizard, similar to the Form Wizard, provides an easy and fast way to design and create one. The wizard asks questions about which data you want to include in the report and how you want to format the data. An example of a printed report is displayed in **Figure 7-10**.

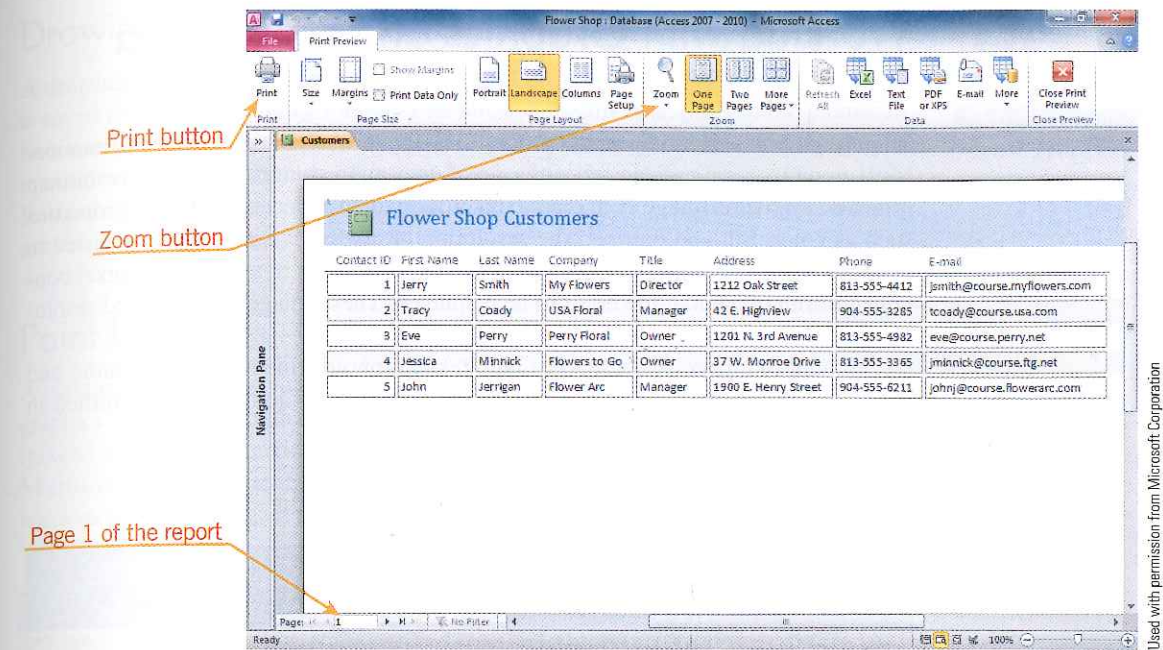


FIGURE 7-10 Access report in Print Preview

Online Databases

Entrepreneurs looking to open an online business often want to find an Internet-based database program. Many online databases are dynamic, which means you can change the content frequently.

Using an online database, you can insert new records and modify, delete, and search existing records. You can set up many online databases by uploading a CSV file from Microsoft Excel or Access. A CSV file is a comma-separated value file that can be exported from any spreadsheet or PC database software.

With some online databases, you can create a template for e-mail marketing. Some other features of Web databases are as follows:

- Create and update a contacts list.
- Change photos frequently and update an online catalog.
- Manage and keep your content current.
- Use online documentation.
- Generate formulas and calculated fields to automatically update your data.
- Keep users up to date with the latest information.
- Import and export information easily.



Working with Graphics and Multimedia Software

You use graphics and multimedia programs to create and edit images and animation. Most graphics applications fall into one of two main categories: vector or bitmap graphics. A vector image consists of many individual objects, each with properties such as color, fill, and outline. The resolution of a vector image can be adjusted to the highest quality. A bitmap image is composed of pixels in a grid. Each pixel contains information about the color to be displayed. These images have a fixed resolution and cannot be resized without losing image quality.

In addition to graphics such as pictures and photos, media includes audio and video files for playing music and videos. Digital media file types are identified in **Table 7-1**.

TABLE 7-1 Digital media file types

FILE TYPE	MEDIA	DESCRIPTION
FLV	Video	Adobe format for streaming Web video content
GIF	Graphics	Image format for pictures with up to 256 distinct colors
JPG or JPEG	Graphics	Method for compressing graphics files
MOV	Video	File extension for digital video files in QuickTime format
MP3	Audio	Compressed audio format
PNG	Graphics	Bitmapped image format that compresses data
QUICKTIME	Audio and video	Video and audio format that allows for the production of video and multimedia
SWF	Video	Shockwave file format; supports exact positioning of graphical objects
TIF	Graphics	Tagged Image Format; popular among the publishing industry, graphic artists, and photographers for storing images
WAV	Audio	Common audio format

QUICK TIP

Some Web sites offer free clip art that you can download.

Most graphics programs use a variety of tools to create and modify images. The following sections briefly describe types of graphic programs.

Drawing Programs

A drawing program is a graphics program used for creating illustrations. The image is saved in a **vector graphics** format. This allows all individual parts of the picture to be moved, isolated, and scaled independently of the other parts. Because the graphics use mathematical formulas, they can be sized freely without any loss in quality. Resized images will not appear pixelated. Examples of popular drawing programs are Adobe Illustrator and Corel Draw.

Paint Programs

A paint program allows you to simulate painting on the computer through the use of a graphics tablet or a mouse. The images are created with a matrix of picture elements (pixels) and are generated as **bitmapped graphics**. A program called Paint is part of Microsoft Windows. Another popular paint program is Corel Painter. These programs use a variety of tools, such as line, fill, shape, and curve tools (see **Figure 7-11**).

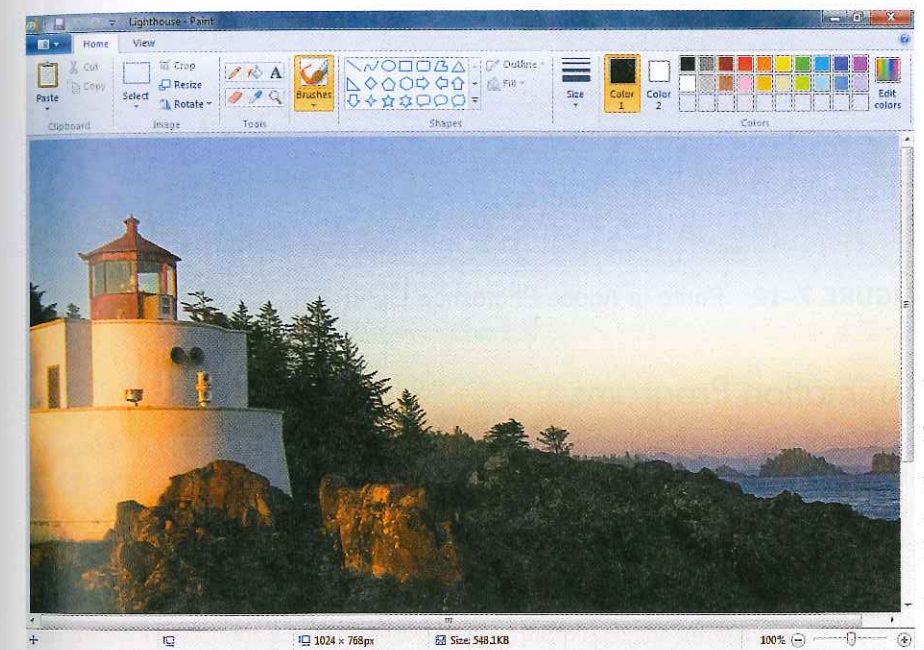


FIGURE 7-11 Image in Paint

VOCABULARY

vector graphics

bitmapped graphics

Photo/Image Manipulation Programs

You use digital editing software to edit images, photos, and logos. Adobe Photoshop Lightroom is a popular photo management and editing software program (see Figure 7-12).



FIGURE 7-12 Photo in Adobe Photoshop Lightroom

Animation Programs

You use animation software to create moving images and 3D graphics. Some of the more popular uses for these programs are online animations and game development. Adobe Flash, 3D Studio Max, and LightWave 3D are examples of this type of software.

Multimedia Programs

Multimedia is defined as the use of text, graphics, audio, and video in some combination to create an effective means of communication and interaction. Some examples of how this software is used are games, interactive presentations, advertisements, screen savers, and interactive books. Figure 7-13 shows a PowerPoint slide show containing images, video, and sound.

VOCABULARY

multimedia

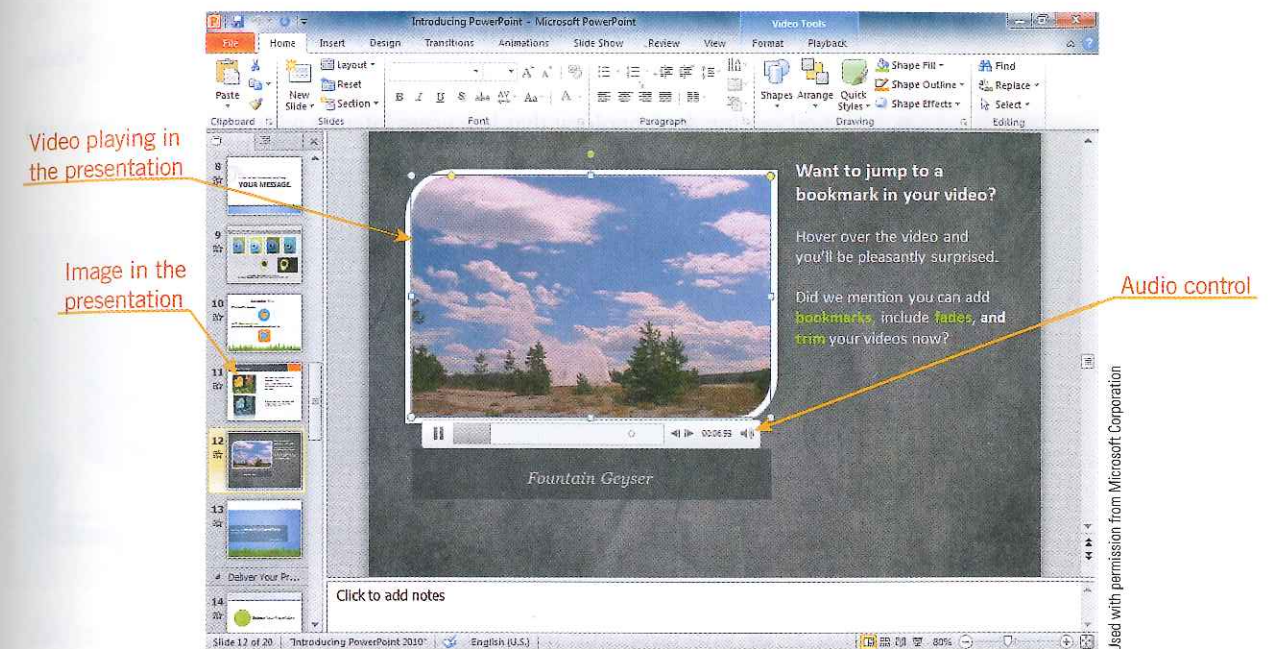


FIGURE 7-13 Multimedia example

Using Other Types of Software

Besides word-processing, spreadsheet, database, and graphics and multimedia software, you can find education and entertainment applications, utility programs, and miscellaneous software such as Web browsers and project management programs. The following sections provide an overview of these types of software.



Education and Entertainment Programs

A wide variety of educational programs are available for users of all ages, from 12 months old to adult. Many of these programs are designed to be entertaining as well as educational. The following describes this type of software:

- **Computer-based training (CBT):** Web-based or computer-based training programs
- **Computer games:** Single-user and multiuser games; combine an educational component with a game format (see **Figure 7-14a**)
- **Audio and video:** Software used to play audio and video; for example, Media Player is audio and video software bundled with Windows
- **Virtual reality:** A technology that lets users interact with a computer-simulated environment (see **Figure 7-14b**)



FIGURE 7-14 (a) Computer game (b) Virtual reality



VOCABULARY

utility program

Utility Programs

Utility programs help you perform computer housekeeping chores. You use these programs to complete specialized tasks related to managing the computer's resources, files, and so on. Some utility programs are part of the operating system, and others are self-contained programs. Utility program types include the following:

- **File compression programs:** Compress one or more files to reduce the amount of storage space required. WinZip is a popular file compression program, and Microsoft Windows includes a compression utility.

- **Defragmentation:** Reduce the amount of fragmentation by organizing the contents of the disk to store the pieces of each file contiguously (see **Figure 7-15a**).
- **Antivirus, antiadware, and antispyware programs:** Use these types of software programs to protect against viruses, remove spyware, and prevent adware from playing or downloading advertisements.
- **Backup program:** Create a copy of data on a drive; you should back up your data files on a regular schedule.
- **Single-purpose tools and accessories:** Use widgets or gadgets, mini-applications that provide tools such as a desktop calculator or clock or can access online services or information such as the weather (see **Figure 7-15b**).

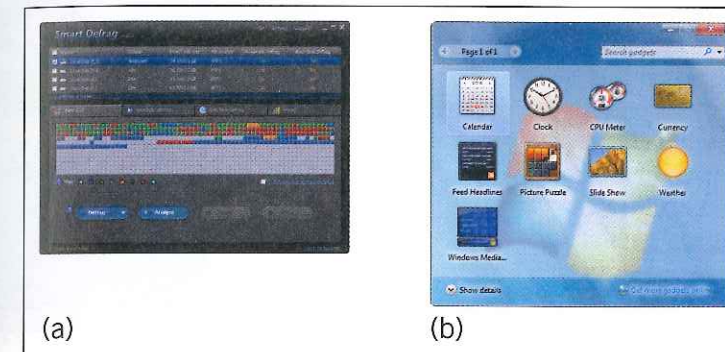


FIGURE 7-15 (a) Defragmentation program (b) Windows Gadget gallery

Miscellaneous Software

In addition to the programs already described, the following are other types of software:

- **Financial and accounting programs:** Prepare financial statements for stockholders, employees, banks, and owners, for example.
- **Electronic mail:** Send and receive messages on the Internet or through company or individual networks.
- **Chat, messaging, and instant messaging software:** Communicate in real time over the Internet by exchanging text messages.
- **Web browser:** Visit Web sites using programs such as Internet Explorer or Firefox to browse the Web.
- **Computer-aided design (CAD):** Design houses, buildings, airplanes, and so on; includes the abilities to view a design from any angle and to zoom in and out.
- **Project management:** Plan, organize, and manage resources of the goals and objectives of a specific project.
- **Groupware:** Participate as a member of a workgroup attached to a local area network to organize your activities; also called workgroup productivity software.
- **Web conferencing:** Attend online meetings, share desktop presentations, and use VoIP, whiteboard, and chat, among other features. Popular Web conferencing programs include Adobe Connect Pro, Fuze Meeting, GoToMeeting, and Zoho Meeting.
- **Integrated programs:** Use software such as Microsoft Office or Adobe Design, which contain a collection of programs within a single suite.



- **Specialized software:** Programs such as airline reservation systems, manufacturing-plant automatic/process control, sales force/customer service automation, and school information management are used for specific activities. **Figure 7-16** depicts examples of specialized software.

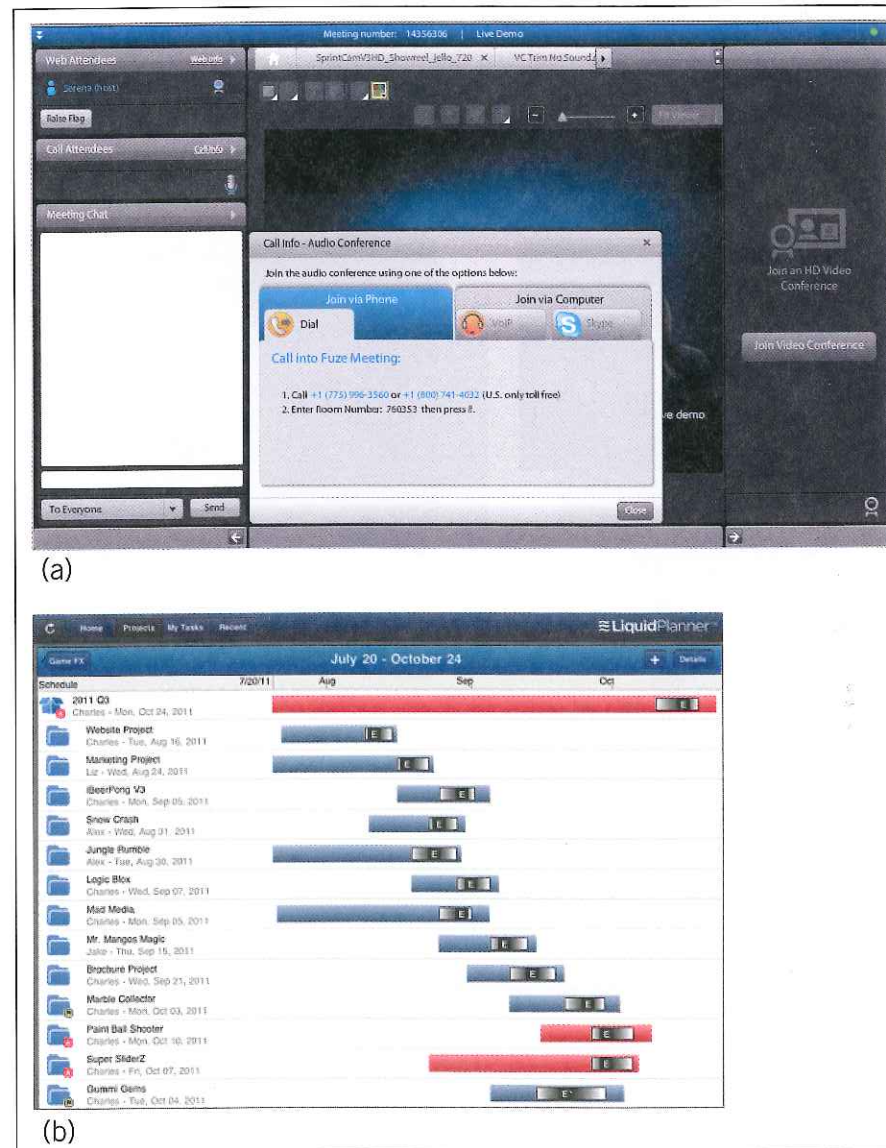


FIGURE 7-16 (a) Web conferencing software (b) Project management software



Selecting the Right Software for the Task

When selecting a software product for a specific activity, be sure to choose one appropriate for the task. For example, you can create tables using Microsoft Word; however, you also can create tables with a spreadsheet program such as Microsoft Excel or a database program such as Microsoft Access. Identify the end result to determine which program is the most appropriate for creating the table you need.

Another example of incorrectly selecting software is using word-processing software to keep copies of financial records when a spreadsheet or an accounting program would be a better choice.

Integrating Software

As indicated previously, you can use individual programs, such as those in Microsoft Office, to perform common tasks in the workplace, in education, and for personal use. In addition to producing individual documents with these applications, you can integrate data from one program into the other programs. In this context, an object is the data or information that you want to share between the programs. Microsoft Office, for example, provides three methods for inserting objects from one Office document into another Office document: copying and pasting, embedding, and linking. Each method has advantages and disadvantages.

The copy-and-paste process between documents is similar to copying and pasting text or other objects within a single document. Assume that you have a chart or worksheet in Excel and you want to add a copy of it to a Word document. In the Excel document you select and copy the content. Next, you open a Word document, click the location where you want to paste the copied data, and then click the Paste button.

Object linking and embedding (OLE) is a technology developed by Microsoft that lets you create a document or object in one program and then link or embed that data into another program. You can embed or link all or part of an existing file. For example, you can create a form letter using Microsoft Word, link it to an Access database file that contains a list of names and addresses, and then merge the form letter with the names and addresses.

Keeping data current in an embedded object can be difficult if the information changes often. A linked object, on the other hand, retains a connection to the original file, which contains the actual data represented by the linked object. Any changes made to the source file are reflected in the linked object. Assume that you have inserted a linked spreadsheet object into a PowerPoint document. If you modify the spreadsheet data in Excel, the linked spreadsheet object in the PowerPoint document is also modified.

Linking is useful when information is maintained independently. Besides linking objects, you can link an entire file to a file in another program. For example, the Personnel department in a company typically maintains employee records in a database file. Other departments in the company use this data for sending mailings, creating interoffice documents, and so on. A link to the employee records file would verify that the information was current.

Another way to integrate software is to use Internet applications that interact with your desktop or network. Adobe Air applications, for example, can update themselves, exchange items with the system clipboard, use the file system, display native windows and menus, contact a local SQL database, and store encrypted data.



QUICK TIP

In addition to embedding and linking Microsoft Office files, you can link a variety of other files, including Adobe and Paint Shop Pro files, video clips, wave sounds, media clips, and others.

VOCABULARY

object linking and embedding (OLE)

SUMMARY

In this lesson, you learned:

- You use word-processing software to create, edit, and print documents and then save the documents electronically. When creating a document, you can easily correct errors and modify data.
- A spreadsheet is a row-and-column arrangement of data. You use electronic spreadsheet software to evaluate, calculate, manipulate, analyze, and present numeric data. A spreadsheet updates calculations automatically.
- A database is a collection of related information organized in a manner that provides for rapid search and retrieval. You use database software to create, maintain, and provide controlled access to data.
- A database can consist of one table or a collection of tables, which are composed of columns and rows, and referred to as fields and records. The primary key, which is assigned to a field, uniquely identifies each record in a table. You also can create queries, forms, and reports using database software.
- You use graphics and multimedia programs to create and edit images and animation. Most graphics applications fall into one of two main categories: vector or bitmap graphics.
- Educational and entertainment programs include computer-based training, computer games, audio and video software, and virtual reality software.
- Utility programs help you perform computer housekeeping chores such as managing the computer's resources and files.
- Miscellaneous software includes programs such as e-mail applications, Web browsers, and project management software.

LESSON REVIEW

TRUE / FALSE

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

- T F 1. Word-processing software is ideal for keeping copies of financial records.
- T F 2. Internet Explorer is a Web browser.
- T F 3. In Excel, individual worksheets are stored within a workbook.
- T F 4. Adobe Photoshop Lightroom is a multimedia program.
- T F 5. A database program and a spreadsheet program have the same purpose.

MULTIPLE CHOICE

Select the best response for each of the following statements.

1. Digital editing software is used to edit _____.
 - A. images
 - B. logos
 - C. photos
 - D. all of the above
2. A(n) _____ program creates a copy of data.
 - A. backup
 - B. utility
 - C. defrag
 - D. antiadware
3. _____ software is used to organize and present information in the form of a slideshow.
 - A. Spreadsheet
 - B. Presentation
 - C. Project management
 - D. Groupware
4. A _____ file can be exported from a spreadsheet or database.
 - A. CSV
 - B. GIF
 - C. CVS
 - D. MP3

5. A _____ program contains rows and columns.
 - A. multimedia
 - B. SWF
 - C. QuickTime
 - D. spreadsheet

FILL IN THE BLANK

Complete the following sentences by writing the correct word or words in the blanks provided.

1. Most _____ programs use a variety of tools to create and modify images.
2. A CSV file is a(n) _____ value file that can be exported from any spreadsheet or PC database software.
3. A(n) _____ is composed of columns and rows, referred to as fields and records in Access.
4. _____ software is a computer program you use to organize and present information, usually as a slide show.
5. Columns in a spreadsheet are identified by _____.

PROJECTS

PROJECT 7-1

This lesson discussed widgets and gadgets. Complete the following:



1. Use the Internet to research the terms widget and gadget.
2. Locate a minimum of 10 widgets and gadgets. Note the Web addresses of the most useful Web pages.
3. Use your word-processing program to write a short overview of each one. Include the Web site address.

PROJECT 7-2

You can find many graphics programs to suit your needs. Complete the following:



1. Use your favorite search engine to research the topic of graphics programs. Note the Web addresses of the most useful Web pages.
2. Use your word-processing program to list at least five programs, their purpose, and their cost or approximate cost.
3. If you had to select one of these programs to purchase, explain which program you would choose and why. Price is no object.

PROJECT 7-3

This lesson discussed the differences between types of software. Complete the following:



1. Use your word-processing program and create a table with four columns and five rows.
2. Name the columns *Word Processing*, *Spreadsheet*, *Database*, and *Presentation*. Bold the headings.
3. In column 1, list five activities for which you would use a word-processing program; in column 2, list five activities for which you would use a spreadsheet program; in column 3, list five activities for which you would use a database program; and in column 4, list five activities for which you would use a presentation program.
4. Change the text color of the word-processing activities to green, the text color of the spreadsheet activities color to orange, the text color of the database activities to blue, and the text color of the presentation activities to red.

TEAMWORK PROJECT

This lesson discussed specialized software. Interview the technology specialist for your school. Ask questions such as what types of programs are used, how textbooks are ordered, what software is used for class scheduling, how the payroll is handled, what other financial programs are used, and other pertinent topics. As a group, use the answers to the questions to create a presentation to share with your classmates. Integrate a spreadsheet into your presentation that shows the data you used.



CRITICAL THINKING

FileMaker Pro, available for both Macintosh and PC, is a database program somewhat similar to Microsoft Access, but does not contain as many advanced features. Instead, it is ideal for small businesses and home users. Use Google or another search engine to

research this software and then write a short review of its pros and cons. Explain why and how it is similar to and different from. Also, provide a short overview of FileMaker Pro's reporting and charting capabilities.



ONLINE DISCOVERY

Virtual reality was described in this lesson. One of the online virtual reality Web sites is located in England.

1. Open your browser and then type the Web site address *www.kenmcbride.com/BenCottages/index.html* into the Address bar. Press Enter to display the Benaughlin Cottages Web site located in the United Kingdom. Use the mouse pointer to manipulate and move the screen. Then use your word-processing

program to write a minimum 100-word description of this Web site.




2. Use Google or another search engine to look for other virtual reality sites. Locate at least one other site. Then use your word-processing software to list the Web site address and write a short description of the Web site.

JOB SKILLS

People with database development skills and experience with various database programs are in high-demand by employers. Companies of all sizes need skilled professionals to manage everything from planning a new database to managing and supporting existing databases. Use the Internet and research the various database programs, and

then list them in a word-processing document. Also research the jobs for database professionals. What skills are necessary for these types of jobs? Is training and certification available? List examples of these training and certification programs.



 Estimated Time:
1.5 hours

LESSON 8

Operating Systems

OBJECTIVES

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

- Identify the purpose of an operating system.
- Identify different operating systems.
- Share files on different operating systems.
- Identify user rights.
- Troubleshoot common operating system problems.

DATA FILES

You do not need data files to complete this lesson.

WORDS TO KNOW

administrative rights
 administrator account
 driver
 embedded operating system
 emulation card
 file system
 handheld operating system
 Linux
 Mac OS X
 operating system (OS)
 Palm OS
 system administrator
 UNIX
 Windows Embedded CE
 Windows Phone