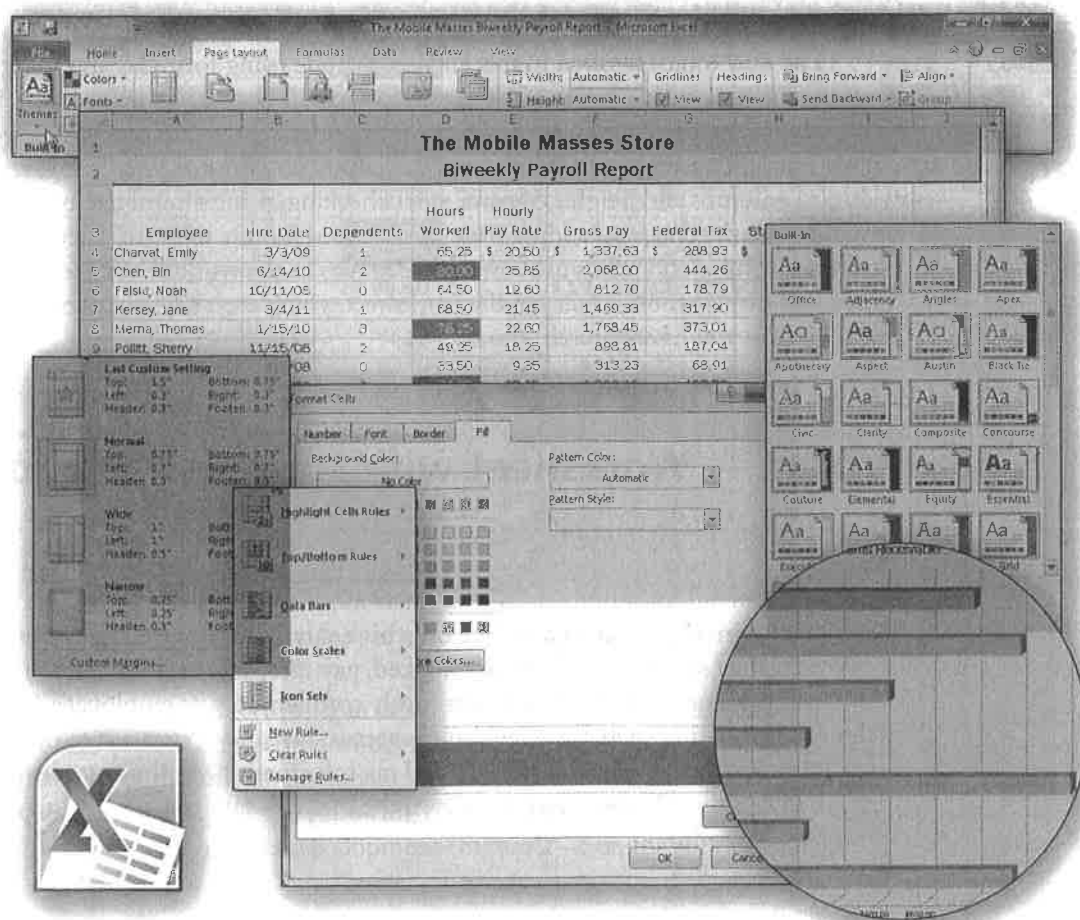# 2 | Formulas, Functions, and Formatting

Objectives

You will have mastered the material in this chapter when you can:

- Enter formulas using the keyboard
- Enter formulas using Point mode
- Apply the AVERAGE, MAX, and MIN functions
- Verify a formula using Range Finder
- Apply a theme to a workbook
- Apply a date format to a cell or range

- Add conditional formatting to cells
- Change column width and row height
- Check the spelling in a worksheet
- Set margins, headers, and footers in Page Layout view
- Preview and print versions of a worksheet

2 | Formulas, Functions, and Formatting

Introduction

In Excel Chapter 1, you learned how to enter data, sum values, format a worksheet to make it easier to read, and draw a chart. This chapter continues to highlight these topics and presents some new ones.

The new topics covered in this chapter include using formulas and functions to create a worksheet. A **function** is a prewritten formula that is built into Excel. Other new topics include option buttons, verifying formulas, applying a theme to a worksheet, adding borders, formatting numbers and text, using conditional formatting, changing the widths of columns and heights of rows, spell checking, using alternative types of worksheet displays and printouts, and adding page headers and footers to a worksheet. One alternative worksheet display and printout shows the formulas in the worksheet instead of the values. When you display the formulas in the worksheet, you see exactly what text, data, formulas, and functions you have entered into it.

Project — Worksheet with Formulas and Functions

The project in this chapter follows proper design guidelines and uses Excel to create the worksheet shown in Figure 2–1. The Mobile Masses Store opened its doors when consumer demand for mobile devices, such as mobile phones and PDAs, had just begun. The store's owners pay each employee on a biweekly basis. Before the owners pay the employees, they summarize the hours worked, pay rate, and tax information for each employee to ensure that the business properly compensates its employees. This summary includes information such as the employee names, hire dates, number of dependents, hours worked, hourly pay rate, net pay, and tax information. As the complexity of the task of creating the summary increases, the owners want to use Excel to create a biweekly payroll report.
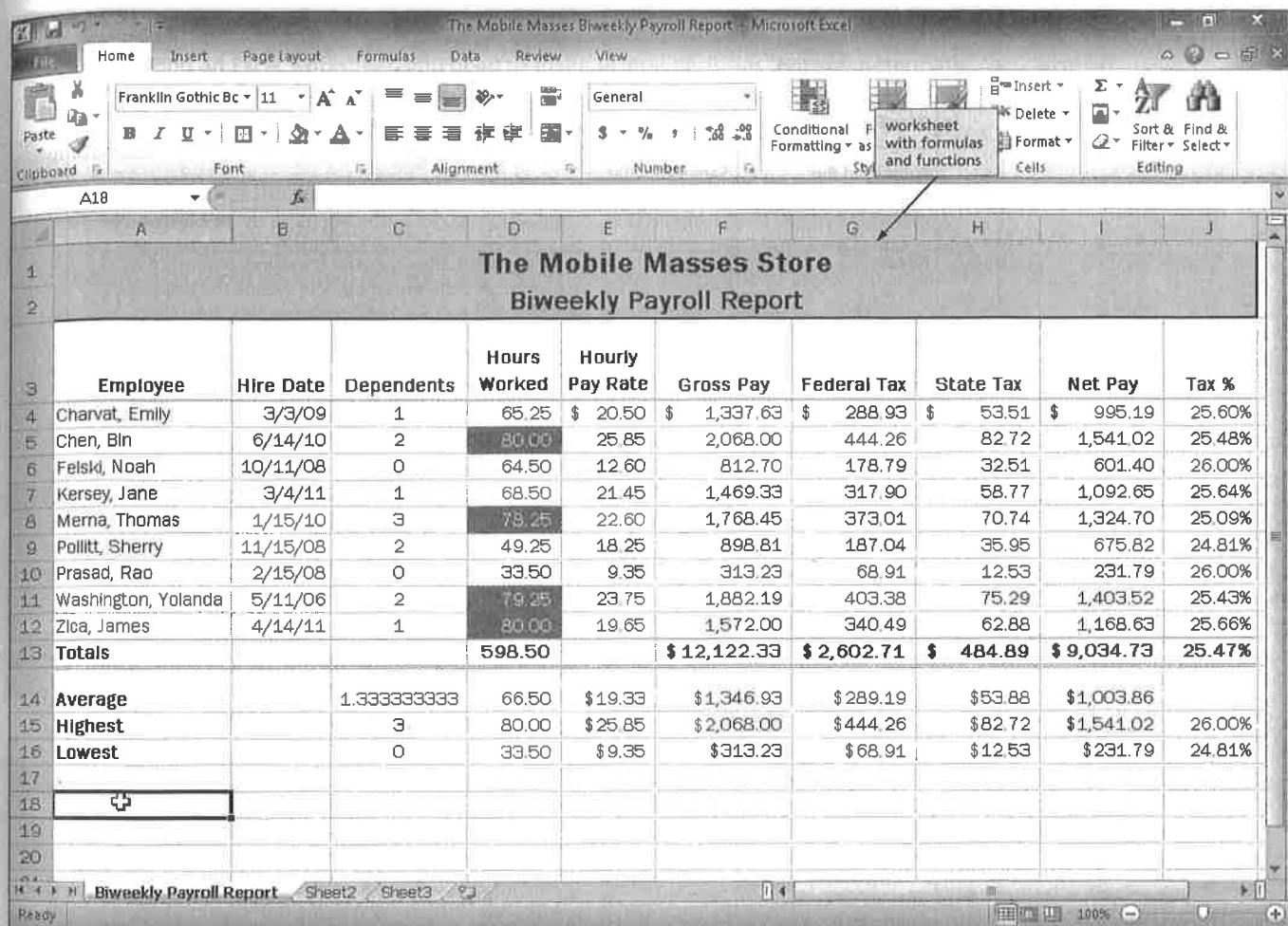
Figure 2 – 1

Recall that the first step in creating an effective worksheet is to make sure you understand what is required. The people who will use the worksheet usually provide the requirements. The requirements document for The Mobile Masses Store Biweekly Payroll Report worksheet includes the following needs: source of data, summary of calculations, and other facts about its development (Figure 2–2 on the following page).

REQUEST FOR NEW WORKSHEET

Date Submitted:	April 16, 2012
Submitted By:	Samuel Snyder
Worksheet Title:	The Mobile Masses Store Biweekly Payroll Report
Needs:	An easy-to-read worksheet that summarizes the company's biweekly payroll (Figure 2-3). For each employee, the worksheet is to include the employee's name, hire date, dependents, hours worked, hourly pay rate, gross pay, federal tax, state tax, net pay, and total tax percent. The worksheet also should include totals and the average, highest value, and lowest value for column of numbers specified below.
Source of Data:	The data supplied by Samuel includes the employee names, hire dates, hours worked, and hourly pay rates. This data is shown in Table 2-1 on page EX 72.
Calculations:	The following calculations must be made for each of the employees: 1. Gross Pay = Hours Worked × Hourly Pay Rate 2. Federal Tax = 0.22 × (Gross Pay − Dependents * 24.32) 3. State Tax = 0.04 × Gross Pay 4. Net Pay = Gross Pay − (Federal Tax + State Tax) 5. Tax % = (Federal Tax + State Tax) / Gross Pay 6. Compute the totals for hours worked, gross pay, federal tax, state tax, and net pay. 7. Compute the total tax percent. 8. Use the AVERAGE function to determine the average for dependents, hours worked, hourly pay rate, gross pay, federal tax, state tax, and net pay. 9. Use the MAX and MIN functions to determine the highest and lowest values for dependents, hours worked, hourly pay rate, gross pay, federal tax, state tax, net pay, and total tax percent.

Approvals

Approval Status:	X	Approved
		Rejected
Approved By:	Julie Adams	
Date:	April 23, 2012	
Assigned To:	J. Quasney, Spreadsheet Specialist	

Figure 2–2

Overview

As you read this chapter, you will learn how to create the worksheet shown in Figure 2–1 by performing these general tasks:

- Enter formulas and apply functions in the worksheet
- Add conditional formatting to the worksheet
- Apply a theme to the worksheet
- Set margins, and add headers and footers to a worksheet
- Work with the worksheet in Page Layout view
- Change margins on the worksheet
- Print a section of the worksheet

General Project Decisions

While creating an Excel worksheet, you need to make several decisions that will determine the appearance and characteristics of the finished worksheet. As you create the worksheet necessary to meet the requirements shown in Figure 2–2, you should follow these general guidelines:

1. **Plan the layout of the worksheet.** Rows typically contain items analogous to items in a list. A name could serve as an item in a list, and, therefore, each name could be placed in a row. As a list grows, such as a list of employees, the number of rows in the worksheet will increase. Information about each item in the list and associated calculations should appear in columns.

2. **Determine the necessary formulas and functions needed.** Calculations result from known values. Formulas for such calculations should be known in advance of creating a worksheet. Values such as the average, highest, and lowest values can be calculated using Excel functions as opposed to relying on complex formulas.

3. **Identify how to format various elements of the worksheet.** The appearance of the worksheet affects its ability to express information clearly. Numeric data should be formatted in generally accepted formats, such as using commas as thousands separators and parentheses for negative values.

4. **Establish rules for conditional formatting.** Conditional formatting allows you to format a cell based on the contents of the cell. Decide under which circumstances you would like a cell to stand out from related cells and determine in what way the cell will stand out.

5. **Specify how the hard copy of a worksheet should appear.** When it is possible that a person will want to create a hard copy of a worksheet, care should be taken in the development of the worksheet to ensure that the contents can be presented in a readable manner. Excel prints worksheets in landscape or portrait orientation, and margins can be adjusted to fit more or less data on each page. Headers and footers add an additional level of customization to the printed page.

When necessary, more specific details concerning the above guidelines are presented at appropriate points in the chapter. The chapter also will identify the actions performed and decisions made regarding these guidelines during the creation of the worksheet shown in Figure 2–1 on page EX 67.

In addition, using a sketch of the worksheet can help you visualize its design. The sketch for The Mobile Masses Store Biweekly Payroll Report worksheet includes a title, a subtitle, column and row headings, and the location of data values (Figure 2–3 on the following page). It also uses specific characters to define the desired formatting for the worksheet, as follows:

1. The row of Xs below the leftmost column defines the cell entries as text, such as employee names.

2. The rows of Zs and 9s with slashes, dollar signs, decimal points, commas, and percent signs in the remaining columns define the cell entries as numbers. The Zs indicate that the selected format should instruct Excel to suppress leading 0s. The 9s indicate that the selected format should instruct Excel to display any digits, including 0s.

3. The decimal point means that a decimal point should appear in the cell entry and indicates the number of decimal places to use.

4. The slashes in the second column identify the cell entry as a date.

5. The dollar signs that are not adjacent to the Zs in the first row below the column headings and in the total row signify a fixed dollar sign. The dollar signs that are adjacent to the Zs below the total row signify a floating dollar sign, or one that appears next to the first significant digit.

Aesthetics versus Function
The function, or purpose, of a worksheet is to provide a user with direct ways to accomplish tasks. In designing a worksheet, functional considerations should come before visual aesthetics. Avoid the temptation to use flashy or confusing visual elements within the worksheet. One exception to this guideline occurs when you may need to draw the user's attention to an area of a worksheet that will help the user more easily complete a task.

The Mobile Masses Store
Biweekly Payroll Report

Employee	Hire Date	Dependents	Hours Worked	Hourly Pay Rate	Gross Pay	Federal Tax	State Tax	Net Pay	Tax %
xxxxxxxxx	99/99/99	99	99.99	$ ZZ9.99	$ ZZ,ZZ9.99	$ ZZ9.99	$ ZZ,ZZ9.99	$ ZZ,ZZ9.99	Z9.99%
Totals			999.99		$ ZZZ,ZZ9.99	$ ZZZ,ZZ9.99	$ ZZZ,ZZ9.99	$ ZZZ,ZZ9.99	Z9.99%
Average		99	99.99	$ ZZ9.99	$ ZZZ,ZZ9.99	$ ZZZ,ZZ9.99	$ ZZZ,ZZ9.99	$ ZZZ,ZZ9.99	
Highest		99							
Lowest		99							Z9.99%

Xs indicate text data

9s indicate numeric data

Zs indicate numeric data with 0s suppressed

$ adjacent to Z indicates floating dollar sign

$ not adjacent to Z indicates a fixed dollar sign

Figure 2–3

6. The commas indicate that the selected format should instruct Excel to display a comma separator only if the number has enough digits to the left of the decimal point.

7. The percent sign (%) in the far-right column indicates a percent sign should appear after the number.

With a good comprehension of the requirements document, an understanding of the necessary decisions, and a sketch of the worksheet, the next step is to use Excel to create the worksheet.

To Start Excel

For an introduction to Windows 7 and instruction about how to perform basic Windows 7 tasks, read the Office 2010 and Windows 7 chapter in this book, where you can learn how to resize windows, change screen resolution, create folders, move and rename files, use Windows Help, and much more.

If you are using a computer to step through the project in this chapter and you want your screens to match the figures in the Office and Windows chapters in this book, you should change your screen's resolution to 1024 × 768. For information about how to change a computer's resolution, refer to the Office 2010 and Windows 7 chapter in this book.

The following steps, which assume Windows 7 is running, start Excel based on a typical installation. You may need to ask your instructor how to start Excel for your computer. For a detailed example of the procedure summarized below, refer to the Office 2010 and Windows 7 chapter.

1. Click the Start button on the Windows 7 taskbar to display the Start menu.

2. Type **Microsoft Excel** as the search text in the 'Search programs and files' text box, and watch the search results appear on the Start menu.

3. Click Microsoft Excel 2010 in the search results on the Start menu to start Excel and display a new blank workbook in the Excel window.

4. If the Excel window is not maximized, click the Maximize button next to the Close button on its title bar to maximize the window.

Entering the Titles and Numbers into the Worksheet

The first step in creating the worksheet is to enter the titles and numbers into the worksheet. The following sets of steps enter the worksheet title and subtitle and then the biweekly payroll report data shown in Table 2–1.

To Enter the Worksheet Title and Subtitle

The following steps enter the worksheet title and subtitle into cells A1 and A2.

1 If necessary, select cell A1. Type `The Mobile Masses Store` in the selected cell and then press the DOWN ARROW key to enter the worksheet title.

2 Type `Biweekly Payroll Report` in cell A2 and then press the DOWN ARROW key to enter the worksheet subtitle (Figure 2–4 on page 73).

The employee names and the row titles Totals, Average, Highest, and Lowest in the leftmost column begin in cell A4 and continue down to cell A16. The employee data is entered into rows 4 through 12 of the worksheet. The remainder of this section explains the steps required to enter the column titles, payroll data, and row titles, as shown in Figure 2–4, and then save the workbook.

To Enter the Column Titles

The column titles in row 3 begin in cell A3 and extend through cell J3. Some of the column titles in Figure 2–3 include multiple lines of text, such as Hours Worked in cell D3. To start a new line in a cell, press ALT+ENTER after each line, except for the last line, which is completed by clicking the Enter box, pressing the ENTER key, or pressing one of the arrow keys. When you see ALT+ENTER in a step, press the ENTER key while holding down the ALT key and then release both keys. The following steps enter the column titles.

1 With cell A3 selected, type `Employee` and then press the RIGHT ARROW key to enter the column heading.

2 Type `Hire Date` in cell B3 and then press the RIGHT ARROW key to enter the column heading.

3 Type `Dependents` and then press the RIGHT ARROW key to enter the column heading.

4 In cell D3, type `Hours` and then press ALT+ENTER to enter the first line of the column heading. Type `Worked` and then press the RIGHT ARROW key to enter the column heading.

5 Type `Hourly` and then press ALT+ENTER to begin a new line in the cell. Type `Pay Rate` and then press the RIGHT ARROW key to enter the column heading.

6 Type `Gross Pay` in cell F3 and then press the RIGHT ARROW key to enter the column heading.

7 Type `Federal Tax` in cell G3 and then press the RIGHT ARROW key to enter the column heading.

8 Type `State Tax` in cell H3 and then press the RIGHT ARROW key to enter the column heading.

9 Type `Net Pay` in cell I3 and then press the RIGHT ARROW key to enter the column heading.

10 Type `Tax %` in cell J3 to enter the column heading.

For an introduction to Office 2010 and instruction about how to perform basic tasks in Office 2010 programs, read the Office 2010 and Windows 7 chapter in this book, where you can learn how to start a program, use the Ribbon, save a file, open a file, quit a program, use Help, and much more.

BTW

The Ribbon and Screen Resolution
Excel may change how the groups and buttons within the groups appear on the Ribbon, depending on the computer's screen resolution. Thus, your Ribbon may look different from the ones in the Office and Windows chapters in this book if you are using a screen resolution other than 1024 × 768.

BTW

BTWs
For a complete list of the BTWs found in the margins of the Office and Windows chapters in this book, visit the Microsoft Office and Concepts CourseMate Web site at www.cengagebrain.com and then navigate to the BTW resource for this book.

To Enter the Biweekly Payroll Data

The biweekly payroll data in Table 2–1 includes a hire date for each employee. Excel considers a date to be a number and, therefore, it displays the date right-aligned in the cell. The following steps enter the data for each employee: name, hire date, dependents, hours worked, and hourly pay rate.

Q&As
For a complete list of the Q&As found in many of the step-by-step sequences in the Office and Windows chapters in this book, visit the Microsoft Office and Concepts CourseMate Web site at www.cengagebrain.com and then navigate to the Q&A resource for this book.

Two-Digit Years
When you enter a two-digit year value (xx) that is less than 30, Excel changes that value to 20xx; when you enter a value that is 30 or greater (zz), Excel changes the value to 19zz. Use four-digit years, if necessary, to ensure that Excel interprets year values the way you intend.

① Select cell A4, type **Charvat, Emily**, and then press the RIGHT ARROW key to enter the employee name.

② Type **3/3/09** in cell B4 and then press the RIGHT ARROW key to enter a date in the selected cell.

③ Type **1** in cell C4 and then press the RIGHT ARROW key to enter a number in the selected cell.

④ Type **65.25** in cell D4 and then press the RIGHT ARROW key to enter a number in the selected cell.

⑤ Type **20.50** in cell E4 and then click cell A5 to enter a number in the selected cell.

⑥ Enter the payroll data in Table 2–1 for the eight remaining employees in rows 5 through 12 (Figure 2–4).

Q&A
In step 2, why did the date that was entered change from 3/3/09 to 3/3/2009?

When Excel recognizes that you entered a date in mm/dd/yy format, it automatically formats the date as mm/dd/yyyy for you. Most professionals prefer to view dates in mm/dd/yyyy format as opposed to mm/dd/yy format because the latter can cause confusion regarding the intended year. For example, a date displayed as 3/3/50 could imply a date of 3/3/1950 or 3/3/2050. The use of a four-digit year eliminates this confusion.

Table 2–1 The Mobile Masses Store Biweekly Payroll Report Data

Employee	Hire Date	Dependents	Hours Worked	Hourly Pay Rate
Charvat, Emily	3/3/09	1	65.25	20.50
Chen, Bin	6/14/10	2	80.00	25.85
Felski, Noah	10/11/08	0	64.50	12.60
Kersey, Jane	3/4/11	1	68.50	21.45
Merna, Thomas	1/15/10	3	78.25	22.60
Pollitt, Sherry	11/15/08	2	49.25	18.25
Prasad, Rao	2/15/08	0	33.50	9.35
Washington, Yolanda	5/11/06	2	79.25	23.75
Zica, James	4/14/11	1	80.00	19.65

Wrapping Text
If you have a long text entry, such as a paragraph, you can instruct Excel to wrap the text in a cell. This method is easier than your pressing ALT+ENTER to end each line of text within the paragraph. To wrap text, right-click in the cell, click Format Cells on a shortcut menu, click the Alignment tab, and then click Wrap text. Excel will increase the height of the cell automatically so that the additional lines will fit. If you want to control where each line ends in the cell, rather than letting Excel wrap the text based on the cell width, you must end each line with ALT+ENTER.

To Enter the Row Titles

The following steps add row titles for the rows that will contain the totals, average, highest, and lowest amounts.

① Select cell A13. Type **Totals** and then press the DOWN ARROW key to enter a row header.

② Type **Average** in cell A14 and then press the DOWN ARROW key to enter a row header.

③ Type **Highest** in cell A15 and then press the DOWN ARROW key to enter a row header.

④ Type **Lowest** in cell A16 and then press the ENTER key to enter a row header. Select cell F4 to prepare to enter a formula in the cell (Figure 2–4).
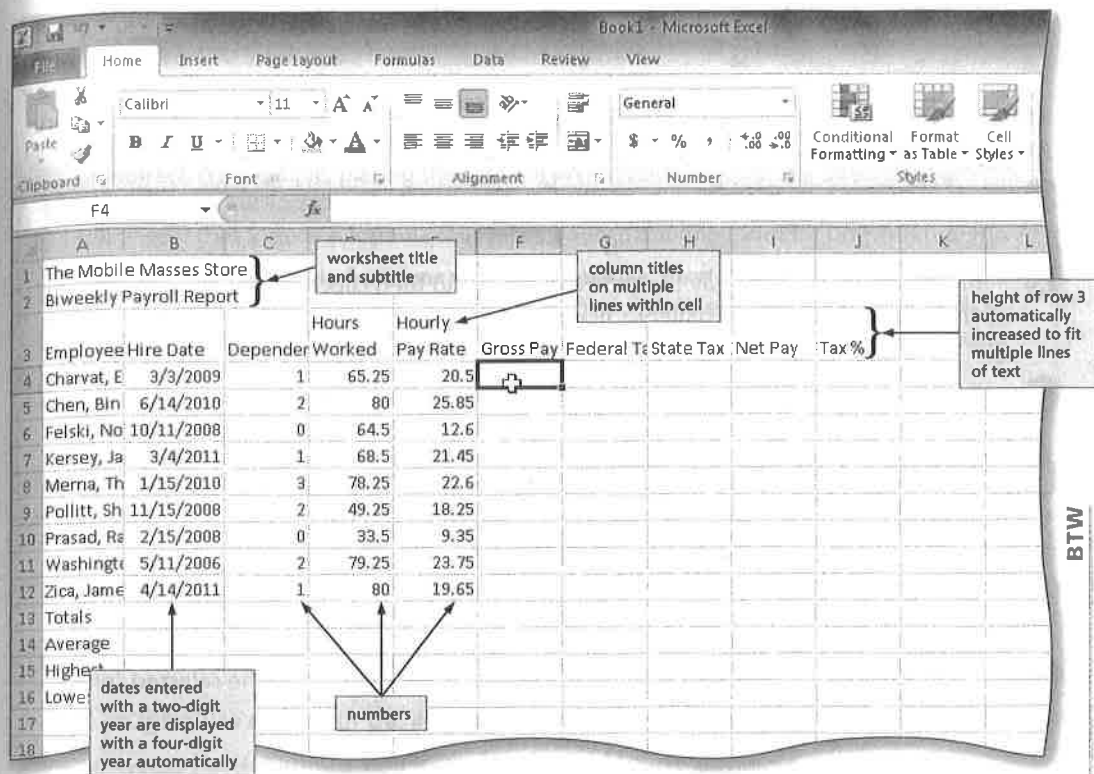
Figure 2–4

Formatting Worksheets
With early worksheet programs, users often skipped rows to improve the appearance of the worksheet. With Excel it is not necessary to skip rows because you can increase row heights to add white space between information.

To Change Document Properties

As discussed in Excel Chapter 1, the first time you save a workbook, you should change the document properties. The following steps change the document properties.

1. Click File on the Ribbon to open the Backstage view. If necessary, click the Info tab in the Backstage view to display the Info gallery.

2. Click the Properties button in the right pane of the Info gallery to display the Properties menu.

3. Click Show Document Panel on the Properties menu to close the Backstage view and display the Document Information Panel in the Excel workbook window.

4. Click the Author text box, if necessary, and then type your name as the Author property. If a name already is displayed in the Author text box, delete it before typing your name.

5. Click the Subject text box, if necessary delete any existing text, and then type your course and section as the Subject property.

6. If an AutoComplete dialog box appears, click its Yes button.

7. Click the Keywords text box, if necessary delete any existing text, and then type `Biweekly Payroll Report` as the Keywords property.

8. If an AutoComplete dialog box appears, click its Yes button.

9. Click the Close the Document Information Panel button so that the Document Information Panel no longer is displayed.

To Change the Sheet Name and Save the Workbook

The following steps change the sheet name to Biweekly Payroll Report, change the sheet tab color, and save the workbook on a USB flash drive in the Excel folder (for your assignments) using the file name, The Mobile Masses Biweekly Payroll Report.

1 Double-click the Sheet1 tab and then enter `Biweekly Payroll Report` as the sheet name and then press the ENTER key.

2 Right-click the tab to display the shortcut menu and then click Tab Color on the shortcut menu to display the Color gallery. Click Blue, Accent 1, Darker 25% (column 5, row 5) in the Theme Colors area to apply a new color to the sheet tab.

3 With a USB flash drive connected to one of the computer's USB ports, click the Save butto on the Quick Access Toolbar to display the Save As dialog box.

4 Type `The Mobile Masses Biweekly Payroll Report` in the File name text bo to change the file name. Do not press the ENTER key after typing the file name because yo do not want to close the dialog box at this time.

5 Navigate to the desired save location (in this case, the Excel folder in the CIS 101 folder [or your class folder] on the USB flash drive).

6 Click the Save button (Save As dialog box) to save the document in the selected folder on the selected drive with the entered file name.

Entering Formulas

One of the reasons Excel is such a valuable tool is that you can assign a **formula** to a cell, and Excel will calculate the result. Consider, for example, what would happen if you had to multiply 65.25 by 20.5 and then manually enter the product for Gross Pay, 1,337.625, in cell F4. Every time the values in cells D4 or E4 changed, you would have to recalculate the product and enter the new value in cell F4. By contrast, if you enter a formula in cell F4 to multiply the values in cells D4 and E4, Excel recalculates the product whenever new values are entered into those cells and displays the result in cell F4.

Plan Ahead

Determine the formulas and functions needed.
As you have learned, formulas and functions simplify the creation and maintenance of worksheets because Excel performs calculations for you. When formulas and functions are used together properly, the amount of data that a user manually must enter in a worksheet greatly can be diminished:

- **Utilize proper algebraic notation.** Most Excel formulas are the result of algebraic calculations. A solid understanding of algebraic operators and the order of operations is important to writing sound formulas.

- **Utilize the fill handle and copy and paste operations to copy formulas.** The fill handle and the Excel copy and paste functionality help to minimize errors caused by retyping formulas. When possible, if a similar formula will be used repeatedly in a worksheet, avoid retyping the formula and instead use the fill handle.

- **Be careful about using invalid and circular cell references.** An invalid reference occurs when Excel does not understand a cell reference used in a formula, resulting in Excel displaying a #REF! error message in the cell.

(continued)

(continued)

A formula in a cell that contains a reference back to itself is called a **circular reference**. Excel often warns you when you create a circular reference. In almost all cases, circular references are the result of an incorrect formula. A circular reference can be direct or indirect. For example, placing the formula =A1 in cell A1 results in a direct circular reference. An indirect circular reference occurs when a formula in a cell refers to another cell or cells that include a formula that refers back to the original cell.

- **Employ the Excel built-in functions whenever possible.** Excel includes prewritten formulas called **functions** to help you compute a range of values and statistics. A function takes a value or values, performs an operation, and returns a result to the cell. The values that you use with a function are called **arguments**. All functions begin with an equal sign and include the arguments in parentheses after the function name. For example, in the function =AVERAGE(C4:C12), the function name is AVERAGE, and the argument is the range C4:C12. Become familiar with the extensive number of built-in functions. When you have the choice, always use built-in functions instead of writing and typing a formula version of your mathematical expression. Such a practice reduces the possibility of errors and simplifies the formula used in a cell, resulting in improved readability.

To Enter a Formula Using the Keyboard

The formulas needed in the worksheet are noted in the requirements document as follows:

1. Gross Pay (column F) = Hours Worked × Hourly Pay Rate
2. Federal Tax (column G) = 0.22 × (Gross Pay − Dependents × 24.32)
3. State Tax (column H) = 0.04 × Gross Pay
4. Net Pay (column I) = Gross Pay − (Federal Tax + State Tax)
5. Tax% (column J) = (Federal Tax + State Tax) / Gross Pay

The gross pay for each employee, which appears in column F, is equal to hours worked in column D times hourly pay rate in column E. Thus, the gross pay for Emily Charvat in cell F4 is obtained by multiplying 65.25 (cell D4) by 20.50 (cell E4) or =D4*E4. The following steps enter the initial gross pay formula in cell F4 using the keyboard.

1

- With cell F4 selected, type =d4*e4 in the cell to display the formula in the formula bar and in the current cell and to display colored borders around the cells referenced in the formula (Figure 2–5).
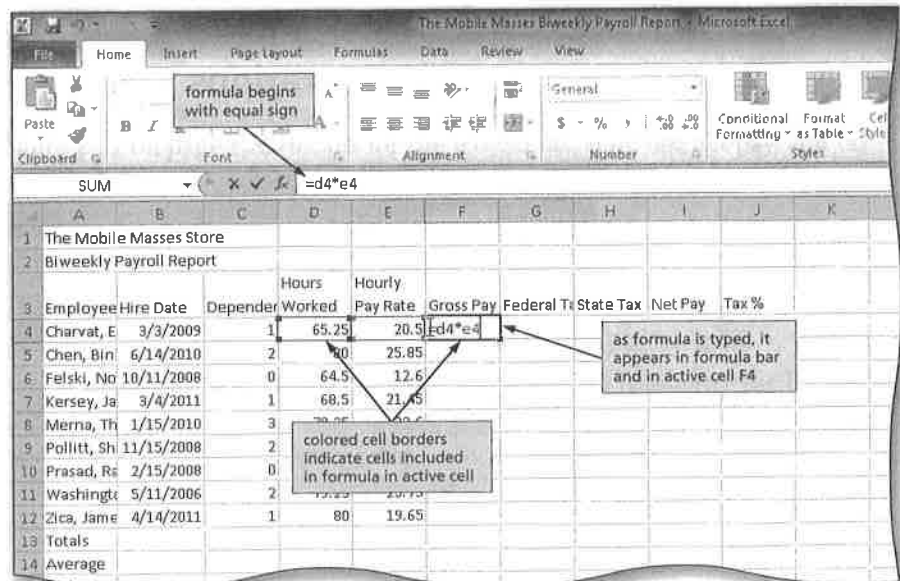
Q&A

What occurs on the worksheet as I enter the formula?

The **equal sign** (=) preceding d4*e4 alerts Excel that you are entering a formula or function and not text. Because the most common error when entering a formula is to reference the wrong cell in a formula mistakenly, Excel colors the borders of the cells referenced in the formula. The coloring helps in the reviewing process to ensure the cell references are correct. The **asterisk** (*) following d4 is the arithmetic operator that directs Excel to perform the multiplication operation.

Figure 2–5

2

- Press the RIGHT ARROW key to complete the arithmetic operation indicated by the formula, to display the result in the worksheet, and to select the cell to the right (Figure 2–6). The number of decimal places shown in cell F4 may be different, but these values will be adjusted later in this chapter.
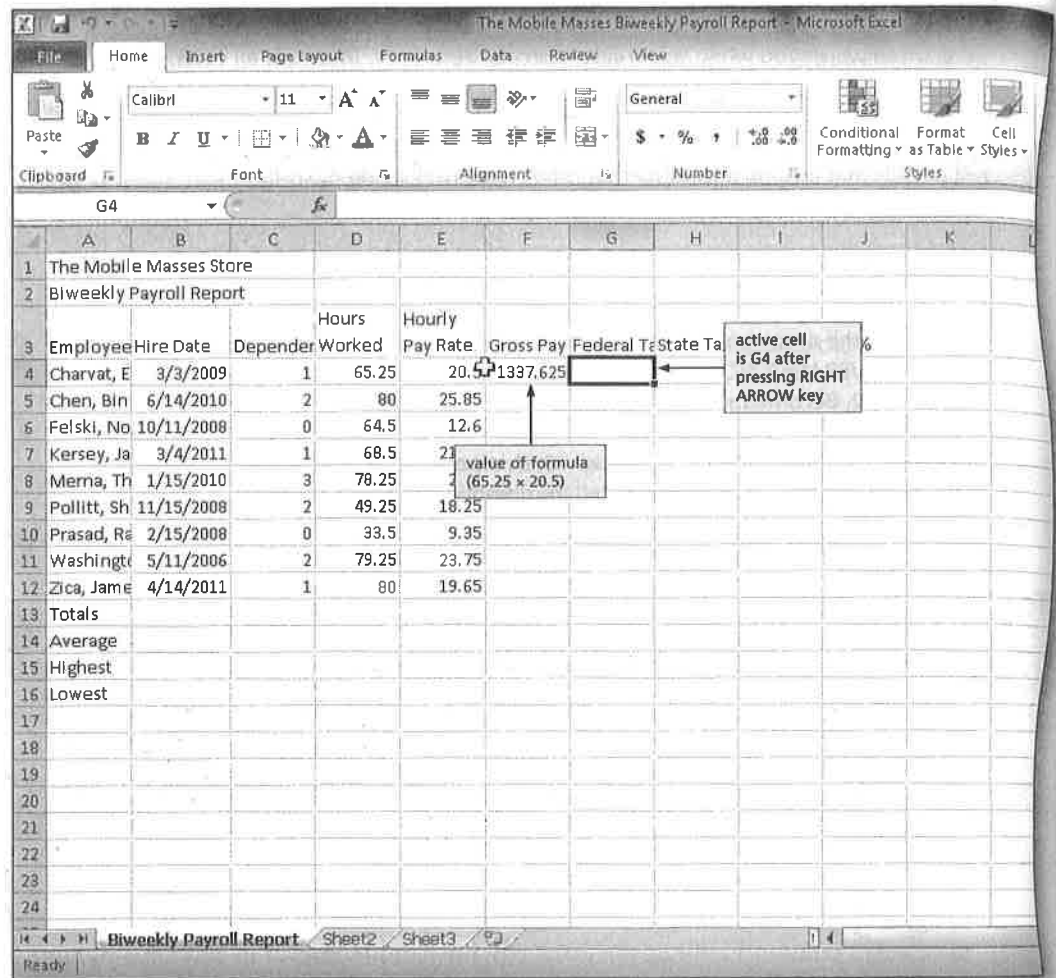

Figure 2–6

Arithmetic Operations

Table 2–2 describes multiplication and other valid Excel arithmetic operators.

Table 2–2 Summary of Arithmetic Operators			
Arithmetic Operator	Meaning	Example of Usage	Meaning
–	Negation	–78	Negative 78
%	Percentage	=23%	Multiplies 23 by 0.01
^	Exponentiation	=3 ^ 4	Raises 3 to the fourth power
*	Multiplication	=61.5 * C5	Multiplies the contents of cell C5 by 61.5
/	Division	=H3 / H11	Divides the contents of cell H3 by the contents of cell H11
+	Addition	=11 + 9	Adds 11 and 9
–	Subtraction	=22 – F15	Subtracts the contents of cell F15 from 22

Order of Operations

When more than one arithmetic operator is involved in a formula, Excel follows the same basic order of operations that you use in algebra. Moving from left to right in a formula, the **order of operations** is as follows: first negation (−), then all percentages (%), then all exponentiations (^), then all multiplications (*) and divisions (/), and finally, all additions (+) and subtractions (−).

As in algebra, you can use parentheses to override the order of operations. For example, if Excel follows the order of operations, 8 * 3 + 2 equals 26. If you use parentheses, however, to change the formula to 8 * (3 + 2), the result is 40, because the parentheses instruct Excel to add 3 and 2 before multiplying by 8. Table 2–3 illustrates several examples of valid Excel formulas and explains the order of operations.

Table 2–3 Examples of Excel Formulas

Formula	Meaning
=G15	Assigns the value in cell G15 to the active cell.
=2^4 + 7	Assigns the sum of 16 + 7 (or 23) to the active cell.
=100 + D2 or =D2 +100 or =(100 + D2)	Assigns 100 plus the contents of cell D2 to the active cell.
=25% * 40	Assigns the product of 0.25 times 40 (or 10) to the active cell.
– (K15 * X45)	Assigns the negative value of the product of the values contained in cells K15 and X45 to the active cell. You do not need to type an equal sign before an expression that begins with minus signs, which indicates a negation.
=(U8 – B8) * 6	Assigns the product of the difference between the values contained in cells U8 and B8 times 6 to the active cell.
=J7 / A5 + G9 * M6 – Z2 ^ L7	Completes the following operations, from left to right: exponentiation (Z2 ^ L7), then division (J7 / A5), then multiplication (G9 * M6), then addition (J7 / A5) + (G9 * M6), and finally subtraction (J7 / A5 + G9 * M6) – (Z2 ^ L7). If cells A5 = 6, G9 = 2, J7 = 6, L7 = 4, M6 = 5, and Z2 = 2, then Excel assigns the active cell the value −5; that is, 6 / 6 + 2 * 5 – 2 ^ 4 = −5.

To Enter Formulas Using Point Mode

The sketch of the worksheet in Figure 2–3 on page EX 70 calls for the federal tax, state tax, net pay, and tax % for each employee to appear in columns G, H, I, and J, respectively. All four of these values are calculated using formulas in row 4:

Federal Tax (cell G4) = 0.22 × (Gross Pay − Dependents × 24.32) or =0.22*(F4−C4*24.32)

State Tax (cell H4) = 0.04 × Gross Pay or = 0.04* F4

Net Pay (cell I4) = Gross Pay − (Federal Tax + State Tax) or =F4-(G4+H4)

Tax % (cell J4) = (Federal Tax + State Tax) / Gross Pay or =(G4+H4)/F4

An alternative to entering the formulas in cells G4, H4, I4, and J4 using the keyboard is to enter the formulas using the mouse and Point mode. **Point mode** allows you to select cells for use in a formula by using the mouse. The steps on the following pages enter formulas using Point mode.

1

- With cell G4 selected type `=0.22*(` to begin the formula and then click cell F4 to add a cell reference in the formula (Figure 2–7).
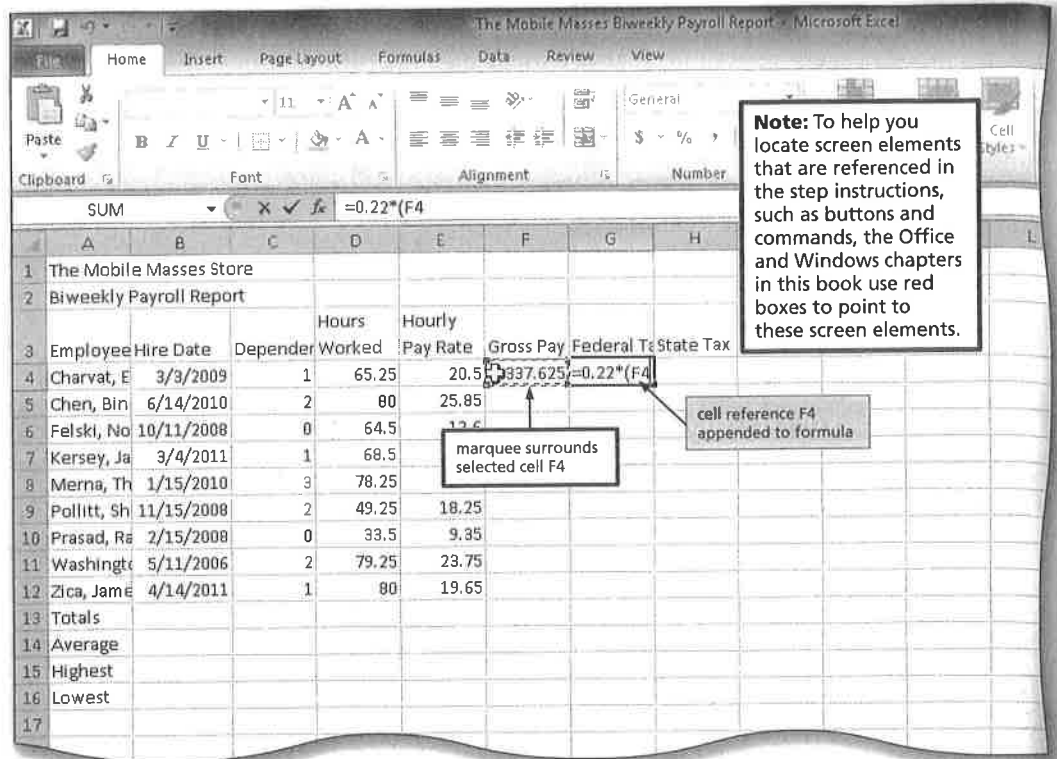

Figure 2–7

2

- Type `–` (minus sign) and then click cell C4 to add a subtraction operator and a reference to another cell to the formula.

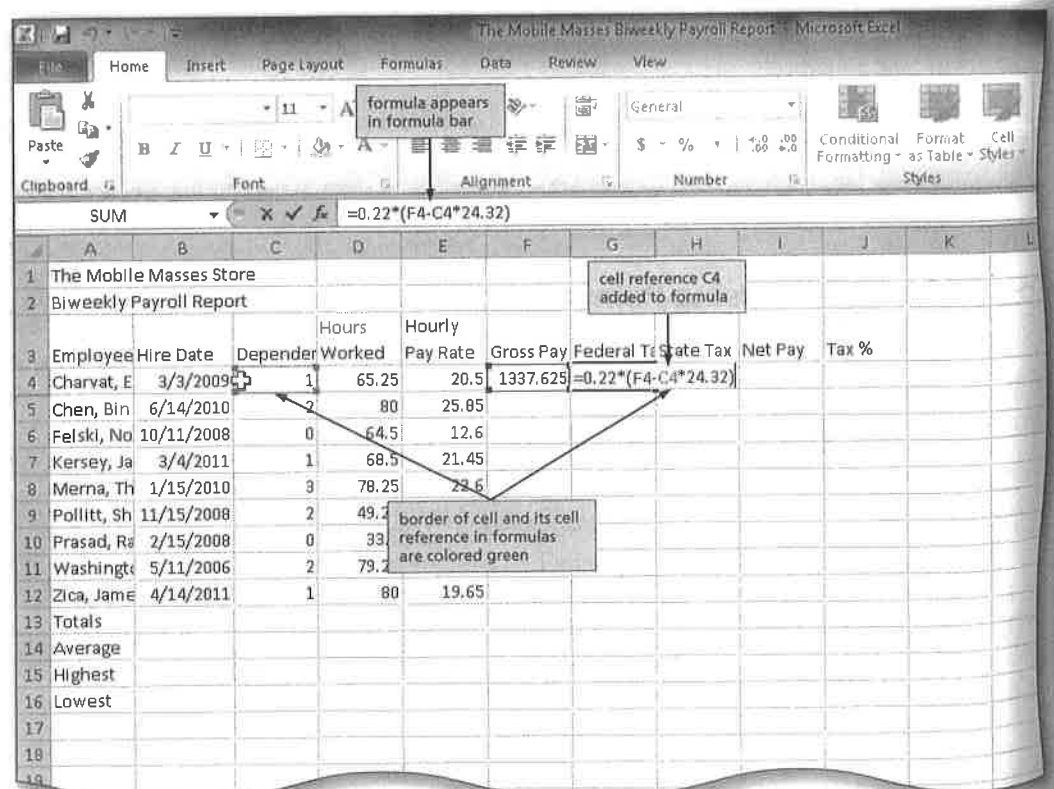- Type `*24.32)` to complete the formula (Figure 2–8).

Figure 2–8

3

- Click the Enter box in the formula bar and then select cell H4 to prepare to enter the next formula.

- Type =0.04* and then click cell F4 to add a cell reference to the formula (Figure 2–9).
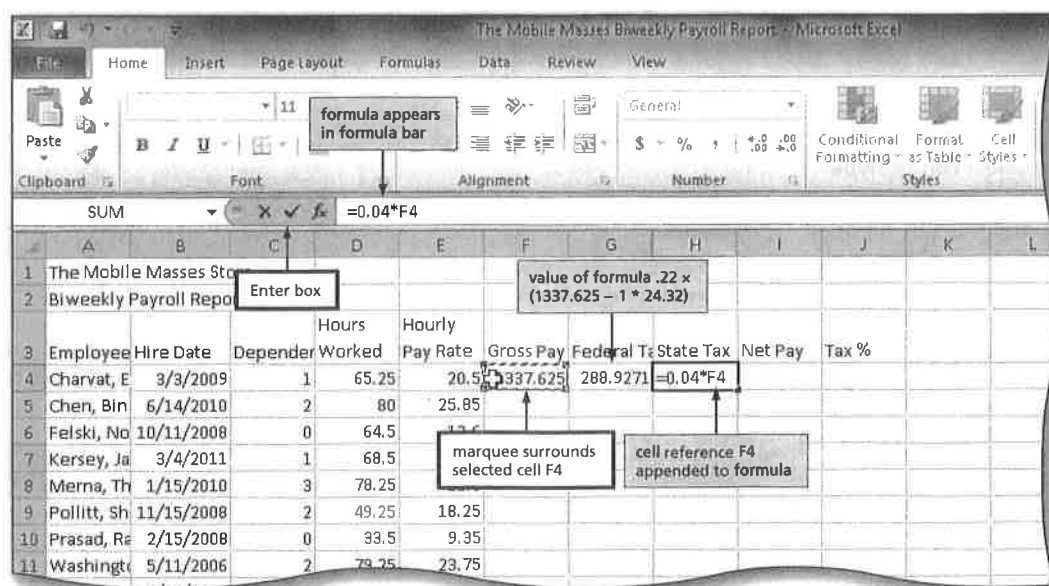
Figure 2–9

Why should I use Point mode to enter formulas?

Using Point mode to enter formulas often is faster and more accurate than using the keyboard to type the entire formula when the cell you want to select does not require you to scroll. In many instances, as in these steps, you may want to use both the keyboard and mouse when entering a formula in a cell. You can use the keyboard to begin the formula, for example, and then use the mouse to select a range of cells.

4

- Click the Enter box in the formula bar and then select cell I4 to prepare to enter the next formula.

- Type = (equal sign) and then click cell F4 to begin the formula and add a cell reference to the formula.

- Type – ((minus sign followed by an open parenthesis) and then click cell G4 to add a subtraction operator, open parenthesis, and cell reference to the formula.

Figure 2–10

- Type + (plus sign) and then click cell H4 to add an addition operator and cell reference to the formula.

- Type) (close parenthesis) to complete the formula (Figure 2–10).
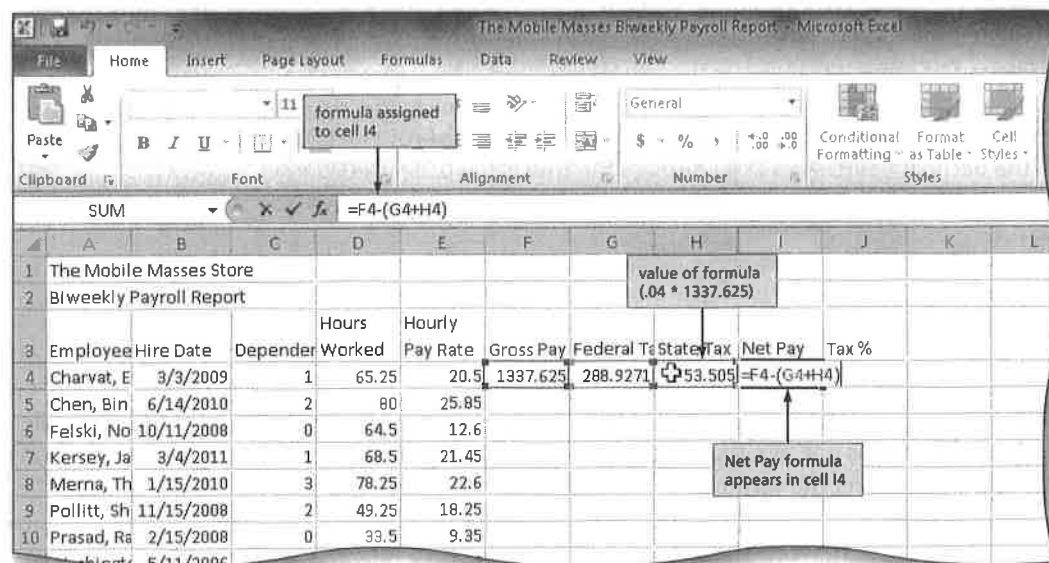
5

- Click the Enter box in the formula bar to enter the formula in cell I4.

- Select cell J4. Type = ((equal sign followed by an open parenthesis) and then click cell G4 to add a reference to the formula.

- Type + (plus sign) and then click cell H4 to add a cell reference to the formula.

- Type) / (close parenthesis followed by a forward slash), and then click cell F4 to add a cell reference to the formula.

- Click the Enter box in the formula bar to enter the formula in cell J4 (Figure 2–11).
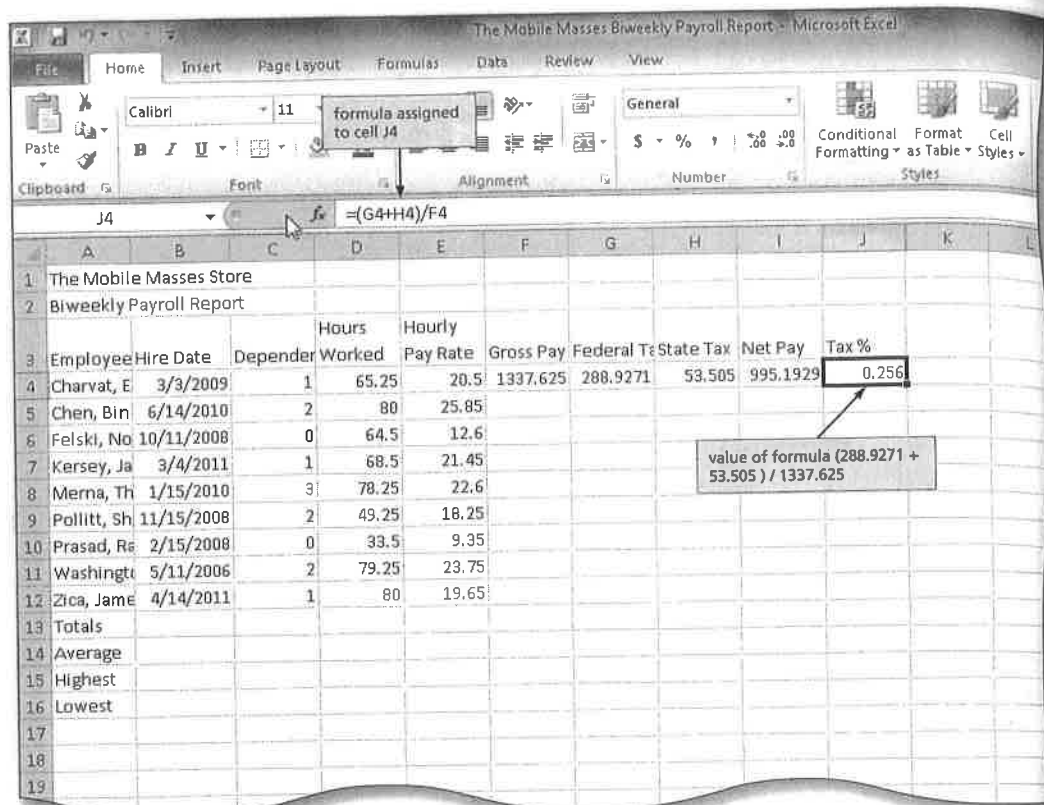
Figure 2–11

Q&A

Why do three decimal places show in cell J4?

The actual value assigned by Excel to cell J4 from the division operation in step 5 is 0.256000075. While not all the decimal places appear in Figure 2–11, Excel maintains all of them for computational purposes. Thus, if referencing cell J4 in a formula, the value used for computational purposes is 0.256000075, not 0.256. The cell formatting is set to display six digits after the decimal point, but the formatting also suppresses trailing zeroes. If the cell formatting were set to display six digits and show trailing zeroes, then Excel would display 0.256000 in cell J4. If you change the cell formatting of column J to display nine digits after the decimal point, then Excel displays the true value 0.256000075.

To Copy Formulas Using the Fill Handle

The five formulas for Emily Charvat in cells F4, G4, H4, I4, and J4 now are complete. You could enter the same five formulas one at a time for the eight remaining employees. A much easier method of entering the formulas, however, is to select the formulas in row 4 and then use the fill handle to copy them through row 12. When performing copying operations in Excel, the source area is the cell, or range, from which data or formulas are being copied. When a range is used as a source, sometimes it is called the source range. The destination area is the cell, or range, to which data or formulas are being copied. When a range is used as a destination, sometimes it is called the destination range. Recall from Excel Chapter 1 that the fill handle is a small rectangle in the lower-right corner of the active cell or active range. The following steps copy the formulas using the fill handle.

1

- Select the source range, F4:J4 in this case, and then point to the fill handle.

- Drag the fill handle down through cell J12 and continue to hold the mouse button to select the destination range (Figure 2–12).
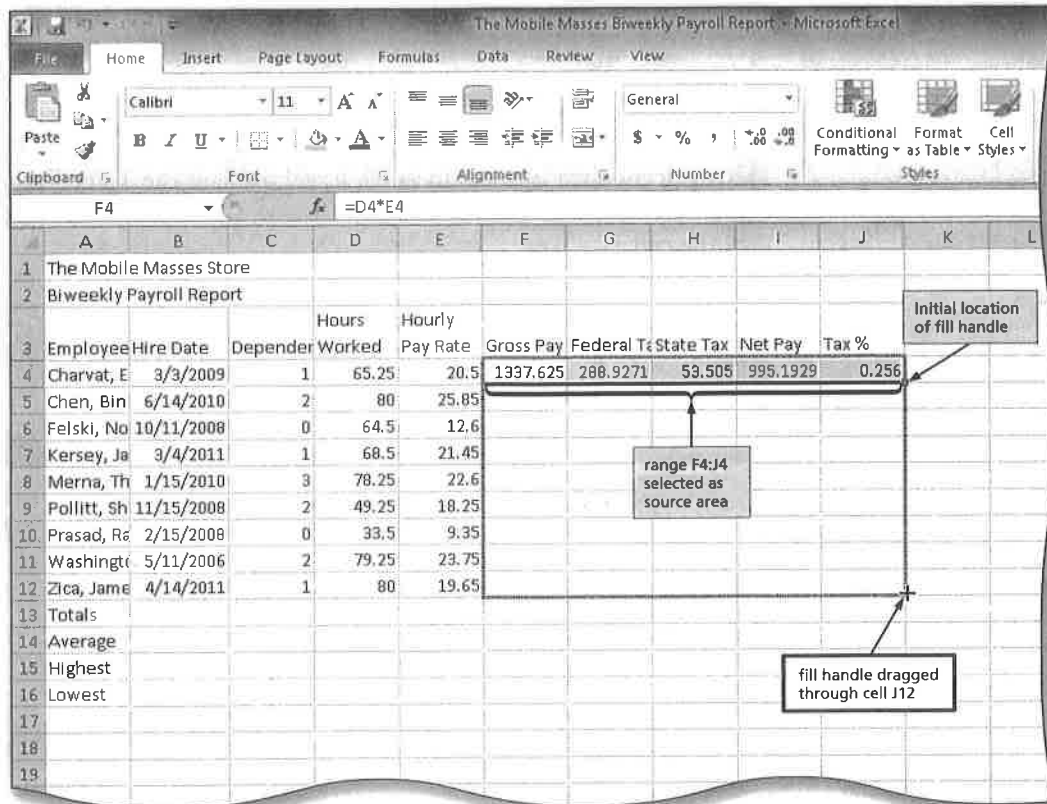

Figure 2–12

2

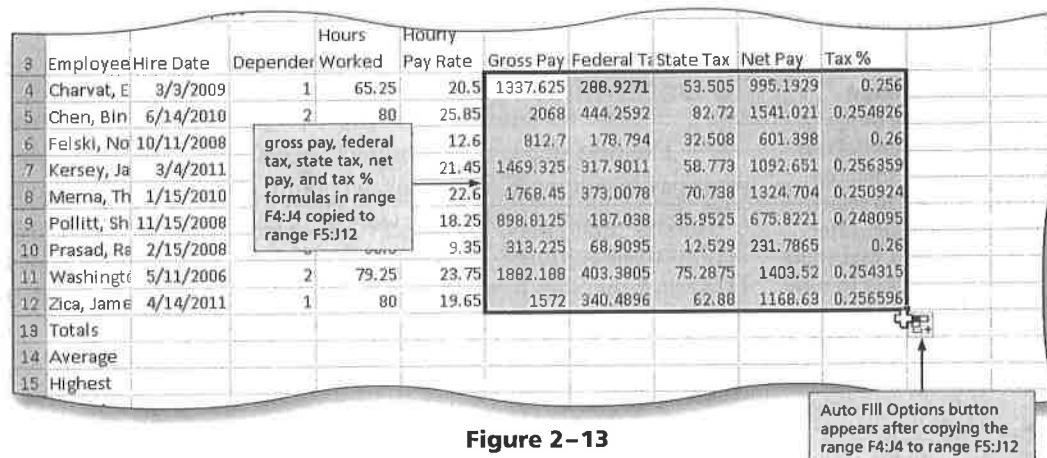- Release the mouse button to copy the formulas to the destination range (Figure 2–13).

Q&A How does Excel adjust the cell references in the formulas in the destination area?

Recall that when you copy a formula, Excel adjusts the cell references so that the new formulas

Figure 2–13

contain references corresponding to the new location and perform calculations using the appropriate values. Thus, if you copy downward, Excel adjusts the row portion of cell references. If you copy across, then Excel adjusts the column portion of cell references. These cell references are called **relative cell references**.

Other Ways
1. Select source area, click Copy button (Home tab | Clipboard group), select destination area, click Paste button (Home tab | Clipboard group)	2. Right-click source area, click Copy on shortcut menu, right-click destination area, click Paste icon on shortcut menu	3. Select source area and then point to border of range; while holding down CTRL, drag source area to destination area

Option Buttons

Excel displays Option buttons in a workbook while you are working on it to indicate that you can complete an operation using automatic features such as AutoCorrect, Auto Fill, error checking, and others. For example, the Auto Fill Options button shown in Figure 2–13 appears after a fill operation, such as dragging the fill handle. When an error occurs in a formula in a cell, Excel displays the Trace Error button next to the cell and identifies the cell with the error by placing a green triangle in the upper left of the cell.

Table 2–4 summarizes the Option buttons available in Excel. When one of these buttons appears on your worksheet, click the button arrow to produce the list of options for modifying the operation or to obtain additional information.

The Paste Options Button
The Paste Options button provides powerful functionality. When performing copy and paste operations, the button allows you great freedom in specifying what it is you want to paste. For example, you could choose to paste an exact copy of what you copied, including the cell contents and formatting. You also could copy just formulas, just formatting, just the cell values, a combination of these options, or a picture of what you copied.

Table 2–4 Options Buttons in Excel

Button	Name	Menu Function
	Auto Fill Options	Gives options for how to fill cells following a fill operation, such as dragging the fill handle.
	AutoCorrect Options	Undoes an automatic correction, stops future automatic corrections of this type, or causes Excel to display the AutoCorrect Options dialog box.
	Insert Options	Lists formatting options following an insertion of cells, rows, or columns.
(Ctrl) ▾	Paste Options	Specifies how moved or pasted items should appear (for example, with original formatting, without formatting, or with different formatting).
	Trace Error	Lists error-checking options following the assignment of an invalid formula to a cell.

Selecting a Range
You can select a range using the keyboard. Press the F8 key and then use the arrow keys to select the desired range. After you are finished, make sure to press the F8 key to turn off the selection process or you will continue to select ranges.

To Determine Totals Using the Sum Button

The next step is to determine the totals in row 13 for the hours worked in column D, gross pay in column F, federal tax in column G, state tax in column H, and net pay in column I. To determine the total hours worked in column D, the values in the range D4 through D12 must be summed. To do so, enter the function =sum(d4:d12) in cell D13 or select cell D13, click the Sum button (Home tab | Editing group), and then press the ENTER key. Recall that a function is a prewritten formula that is built into Excel. Similar SUM functions can be used in cells F13, G13, H13, and I13 to total gross pay, federal tax, state tax, and net pay, respectively. The following steps determine totals in cell D13 and the range F13:I13.

1 Select cell to contain the sum, cell D13 in this case. Click the Sum button (Home tab | Editing group) to sum the contents of the range D4:D12 in cell D13 and then click the Enter box to display a total in the selected cell.

2 Select the range to contain the sums, range F13:I13 in this case. Click the Sum button (Home tab | Editing group) to display totals in the selected range (Figure 2–14).
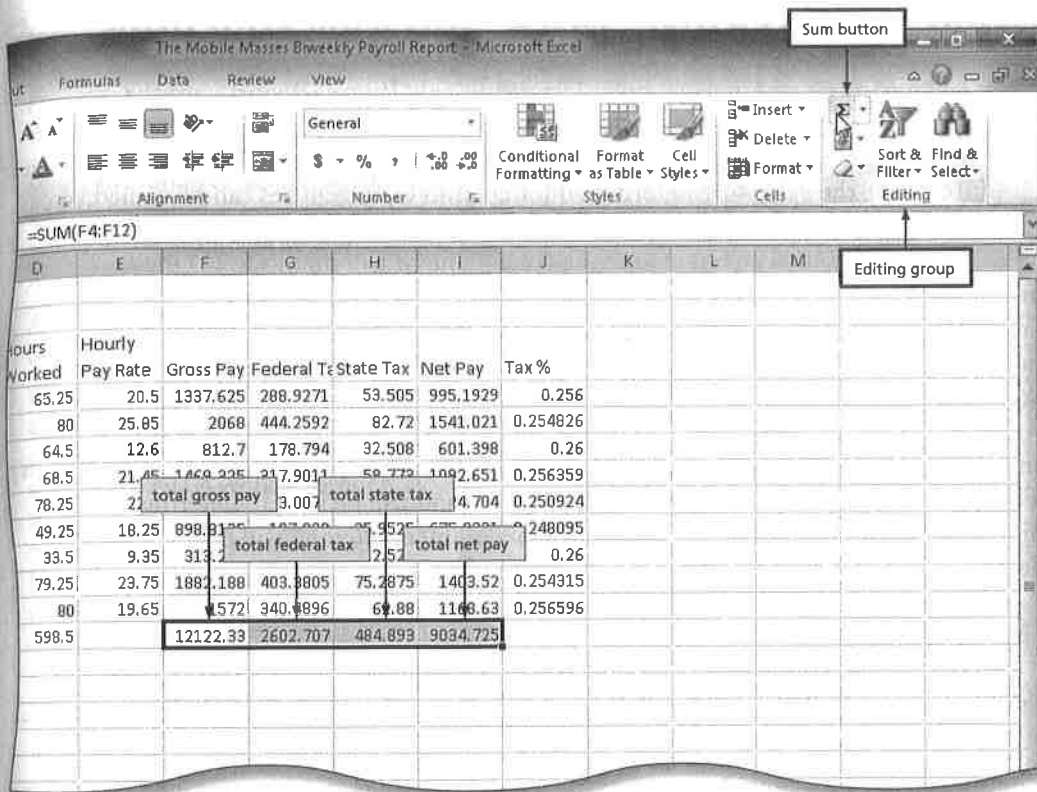
Figure 2-14

To Determine the Total Tax %

With the totals in row 13 determined, the next step is to copy the tax % formula in cell J12 to cell J13 as performed in the following steps.

1 Select the cell to be copied, J12 in this case, and then point to the fill handle.

2 Drag the fill handle down through cell J13 to copy the formula (Figure 2–15).

Q&A

Why was the formula I13/F13 not copied to cell J13 earlier?

The formula, I13/F13, was not copied to cell J13 when cell J4 was copied to the range J5:J12 because both cells involved in the computation (I13 and F13) were blank, or zero, at the time. A **blank cell** in Excel has a numerical value of zero, which would have resulted in an error message in cell J13. Once the totals were determined, both cells I13 and F13 (especially F13, because it is the divisor) had nonzero numerical values.
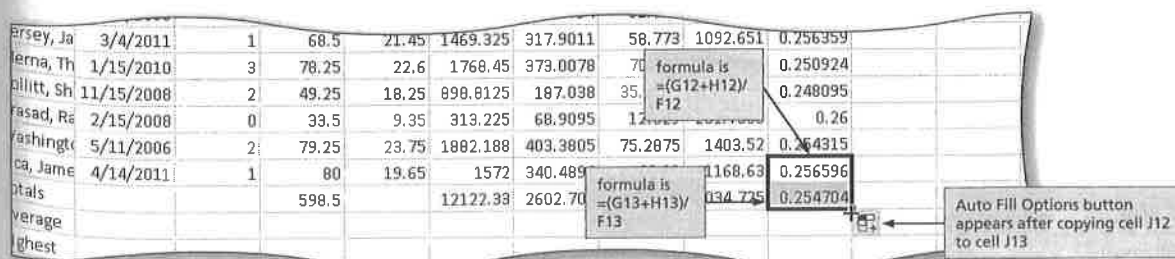
Figure 2-15

Using the AVERAGE, MAX, and MIN Functions

The next step in creating The Mobile Masses Biweekly Payroll Report worksheet is to compute the average, highest value, and lowest value for the number of dependents listed in the range C4:C12 using the AVERAGE, MAX, and MIN functions in the range C14:C16. Once the values are determined for column C, the entries can be copied across to the other columns.

With Excel, you can enter functions using one of five methods: (1) the keyboard or mouse, (2) the Insert Function box in the formula bar, (3) the Sum menu, (4) the Sum command (Formulas tab | Function Library group), and (5) the Name box area in the formula bar (Figure 2–16). The method you choose will depend on your typing skills and whether you can recall the function name and required arguments.

In the following pages, each of the first three methods will be used. The keyboard and mouse method will be used to determine the average number of dependents (cell C14). The Insert Function button in the formula bar method will be used to determine the highest number of dependents (cell C15). The Sum menu method will be used to determine the lowest number of dependents (cell C16).

To Determine the Average of a Range of Numbers Using the Keyboard and Mouse

The **AVERAGE function** sums the numbers in the specified range and then divides the sum by the number of cells with numeric values in the range. The following steps use the AVERAGE function to determine the average of the numbers in the range C4:C12.

1

- Select the cell to contain the average, cell C14 in this case.

- Type =av in the cell to display the Formula AutoComplete list. Press the DOWN ARROW key to highlight the required formula (Figure 2–16).

Q&A What is happening as I type?

As you type the equal sign followed by the characters in the name of a function, Excel displays the Formula AutoComplete list. This list contains those functions that alphabetically match the letters you have typed. Because you typed =av, Excel displays all the functions that begin with the letters av.

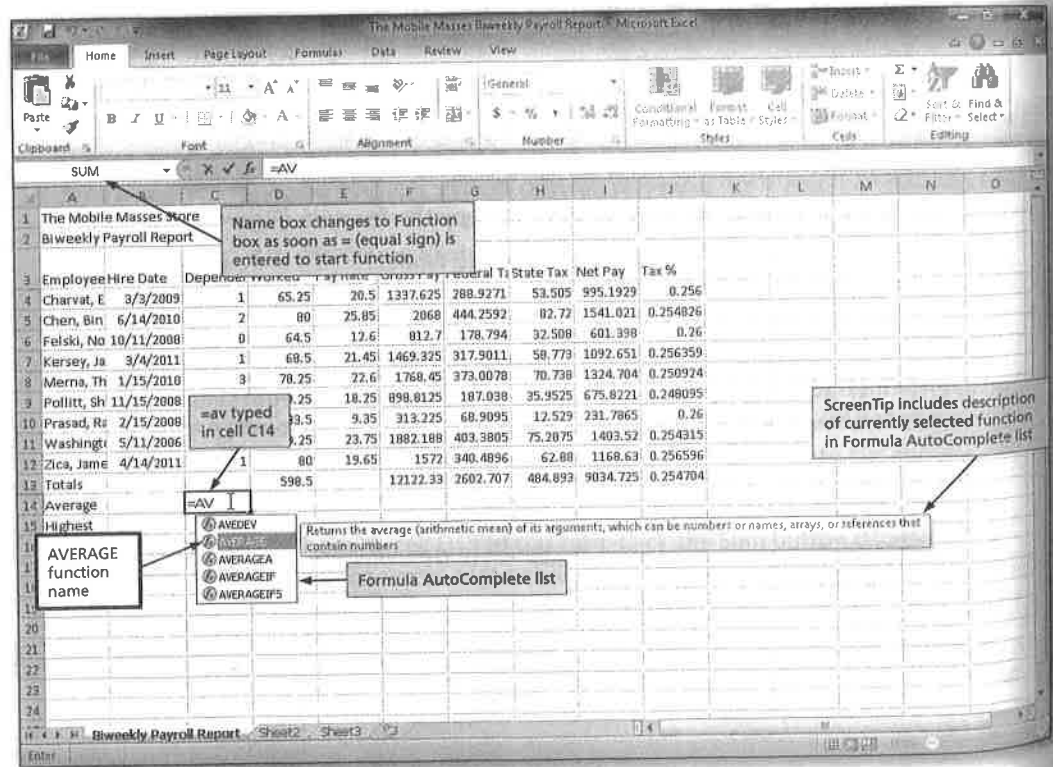Figure 2–16

2

- Double-click AVERAGE in the Formula AutoComplete list to select the function.

- Select the range to be averaged, C4:C12 in this case, to insert the range as the argument to the function (Figure 2–17).

Q&A As I drag, why does the function in cell C14 change?

When you click cell C4, Excel appends cell C4 to the left parenthesis in the formula bar and surrounds cell C4 with a marquee. When you begin dragging, Excel appends to the argument a colon (:) and the cell reference of the cell where the mouse pointer is located.
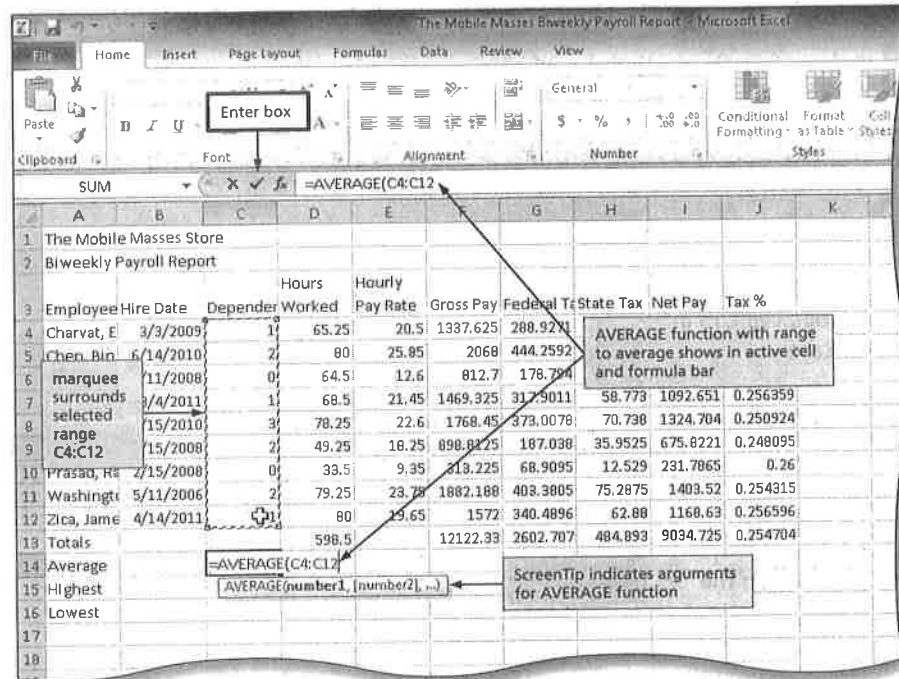
Figure 2–17

3

- Click the Enter box to compute the average of the numbers in the selected range and display the result in the selected cell (Figure 2–18).

Q&A Can I use the arrow keys to complete the entry instead?

No. When you use Point mode you cannot use the arrow keys to complete the entry. While in Point mode, the arrow keys change the selected cell reference in the range you are selecting.

Q&A What is the purpose of the parentheses in the function?

The AVERAGE function requires that the argument (in this case, the range C4:C12) be included within parentheses following the function name. Excel automatically appends the right parenthesis to complete the AVERAGE function when you click the Enter box or press the ENTER key.
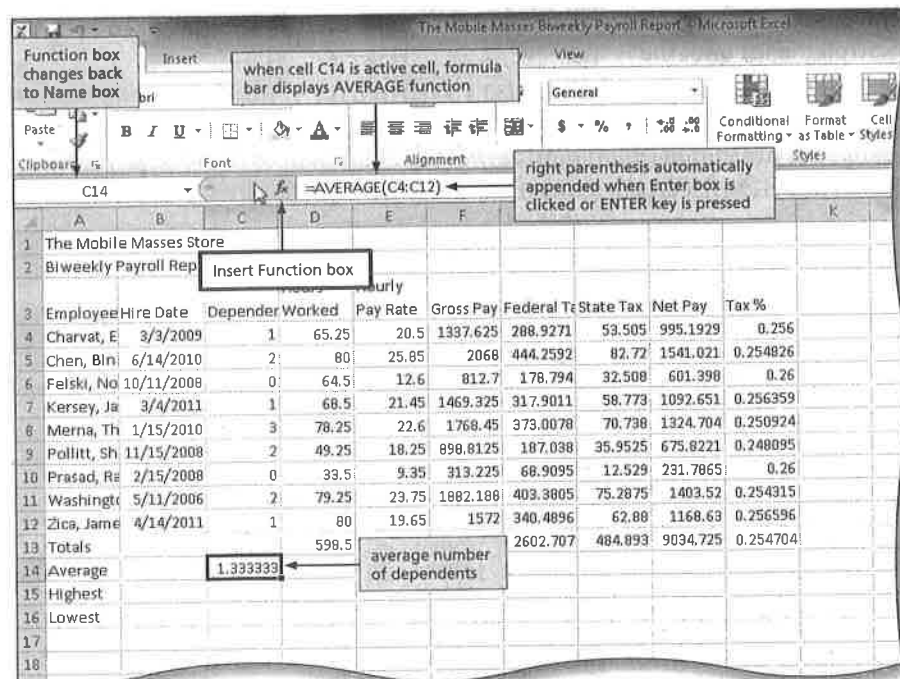
Figure 2–18

Other Ways

1. Click Insert Function box in the formula bar, click AVERAGE
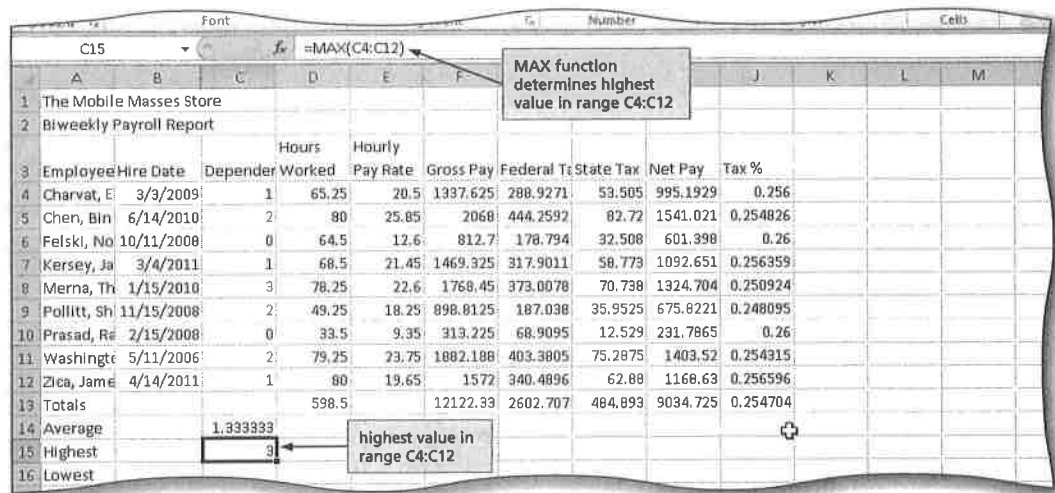
2. Click Sum button arrow (Home tab | Editing group), click Average

3. Click Sum button arrow (Formulas tab | Function Library group), click Average

To Determine the Highest Number in a Range of Numbers Using the Insert Function Box

The next step is to select cell C15 and determine the highest (maximum) number in the range C4:C12. Excel includes a function called the **MAX function** that displays the highest value in a range. Although you could enter the MAX function using the keyboard and Point mode as described in the previous steps, an alternative method to entering the function is to use the Insert Function box in the formula bar. The following steps use the Insert Function box in the formula bar to enter the MAX function.

1

- Select the cell to contain the maximum number, cell C15 in this case.

- Click the Insert Function box in the formula bar to display the Insert Function dialog box.

- Click MAX in the 'Select a function' list (Insert Function dialog box) to select it (Figure 2–19). If the MAX function is not displayed in the 'Select a function' list, scroll the list until the function is displayed.
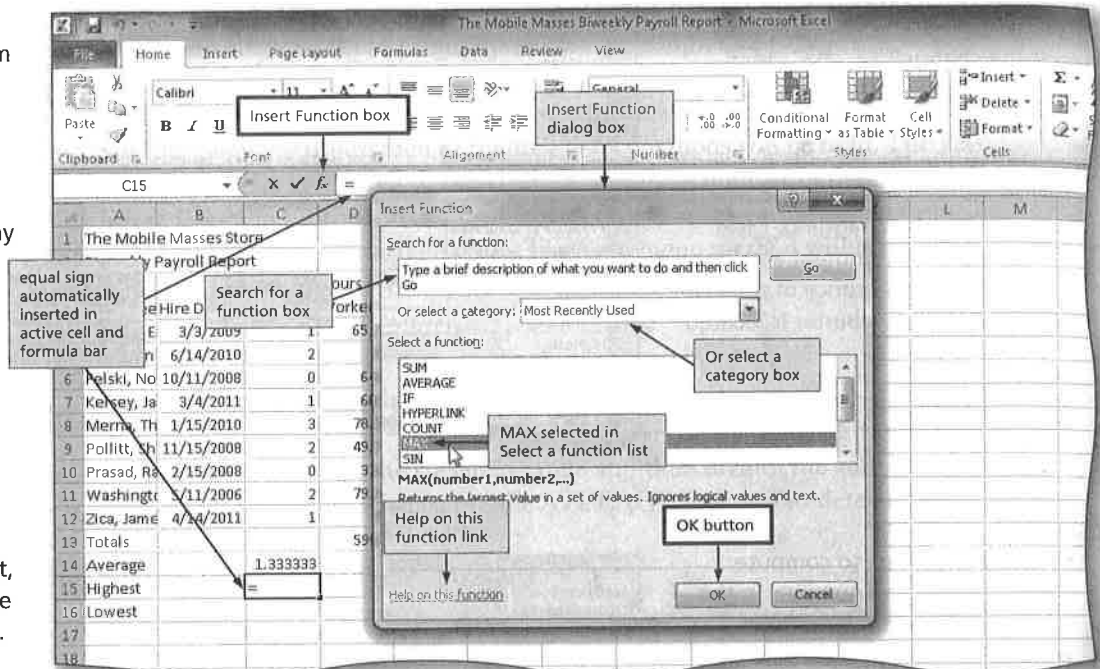
Figure 2–19

2

- Click the OK button (Insert Function dialog box) to display the Function Arguments dialog box.

- Type c4:c12 in the Number1 box (Function Arguments dialog box) to enter the first argument of the function (Figure 2–20).
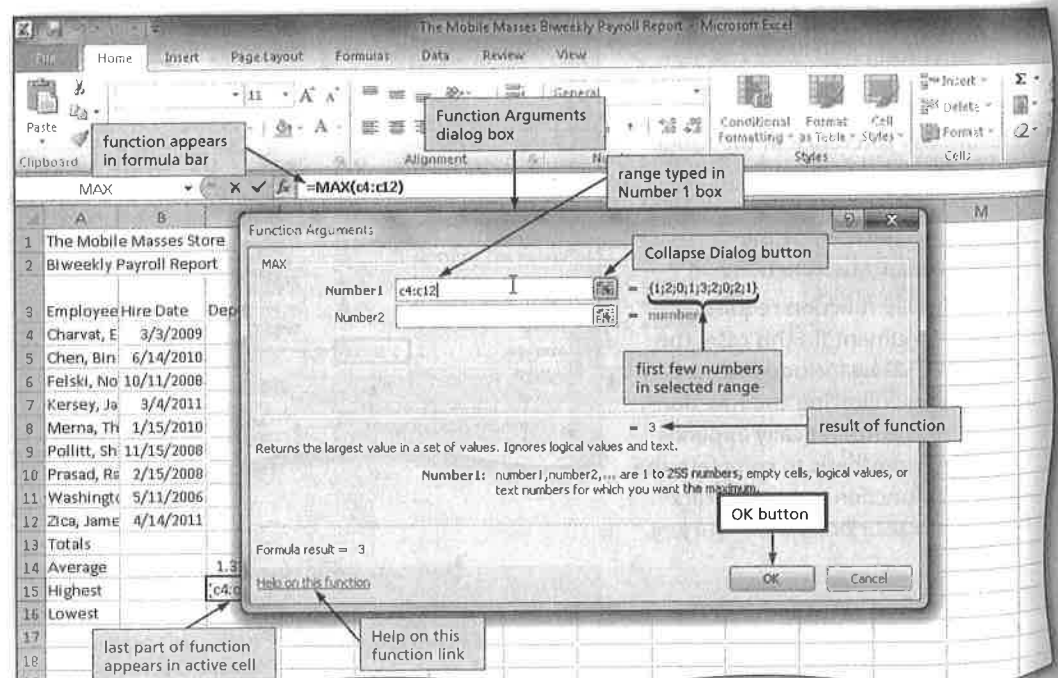
Q&A Why did numbers appear in the Function Arguments dialog box?

As shown in Figure 2–20, Excel displays the value the MAX function will return to cell C15 in the Function Arguments dialog box. It also lists the first few numbers in the selected range, next to the Number1 box.

Figure 2–20

③

- Click the OK button (Function Arguments dialog box) to display the highest value in the chosen range in the selected cell (Figure 2–21).

Q&A Why should I not just enter the highest value that I see in the range C4:C12 in cell C15?

In this example, rather than entering the MAX function, you visually could scan the range C4:C12,

Figure 2–21

determine that the highest number of dependents is 3, and manually enter the number 3 as a constant in cell C15. Excel would display the number the same as in Figure 2–21. Because it contains a constant, however, Excel will continue to display 3 in cell C15, even if the values in the range C4:C12 change. If you use the MAX function, Excel will recalculate the highest value in the range C4:C12 each time a new value is entered into the worksheet.

Other Ways

1. Click Sum button arrow (Home tab | Editing group), click Max

2. Click Sum button arrow (Formulas tab | Function Library group), click Max

3. Type =MAX in cell

To Determine the Lowest Number in a Range of Numbers Using the Sum Menu

The next step is to enter the **MIN function** in cell C16 to determine the lowest (minimum) number in the range C4:C12. Although you can enter the MIN function using either of the methods used to enter the AVERAGE and MAX functions, the following steps perform an alternative using the Sum button (Home tab | Editing group).

①

- Select cell C16 to prepare to enter the next function.

- Click the Sum button arrow (Home tab | Editing group) to display the Sum button menu (Figure 2–22).

Q&A Why should I use the Sum button menu?

Using the Sum button menu allows you to enter one of five often-used functions easily into a cell, without having to memorize its name or the required arguments.
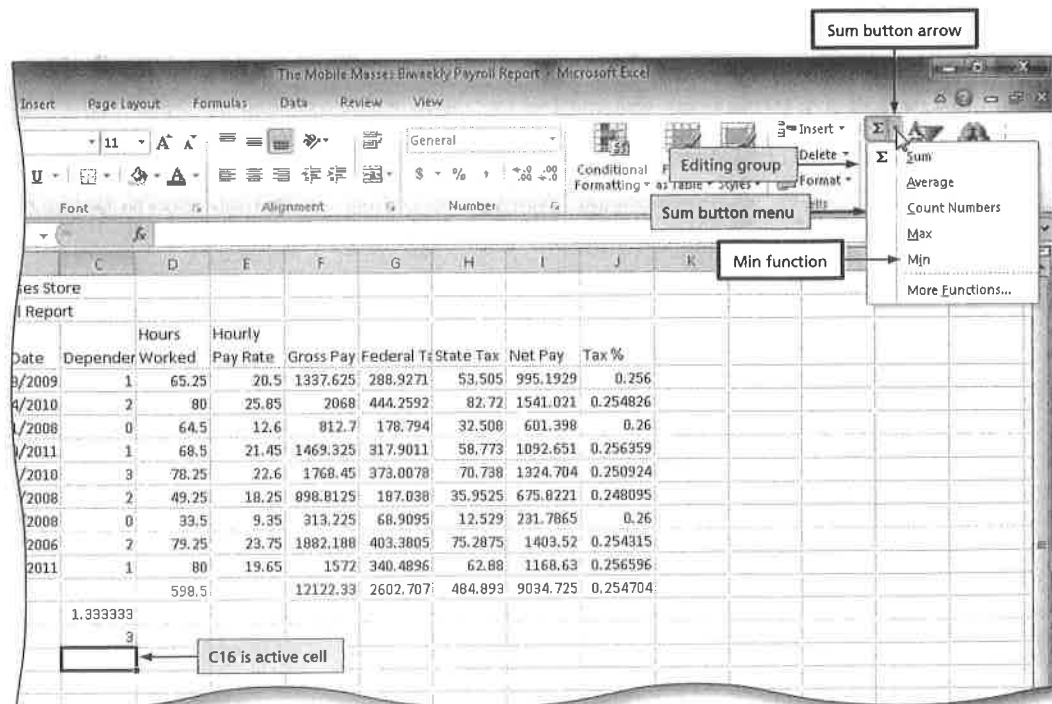

Figure 2–22

2

- Click Min to display the MIN function in the formula bar and in the active cell (Figure 2–23).

Q&A

Why does Excel select the range C14:C15?

The range C14:C15 automatically selected by Excel is not correct. Excel attempts to guess which cells you want to include in the function by looking for ranges that are adjacent to the selected cell and that contain numeric data.
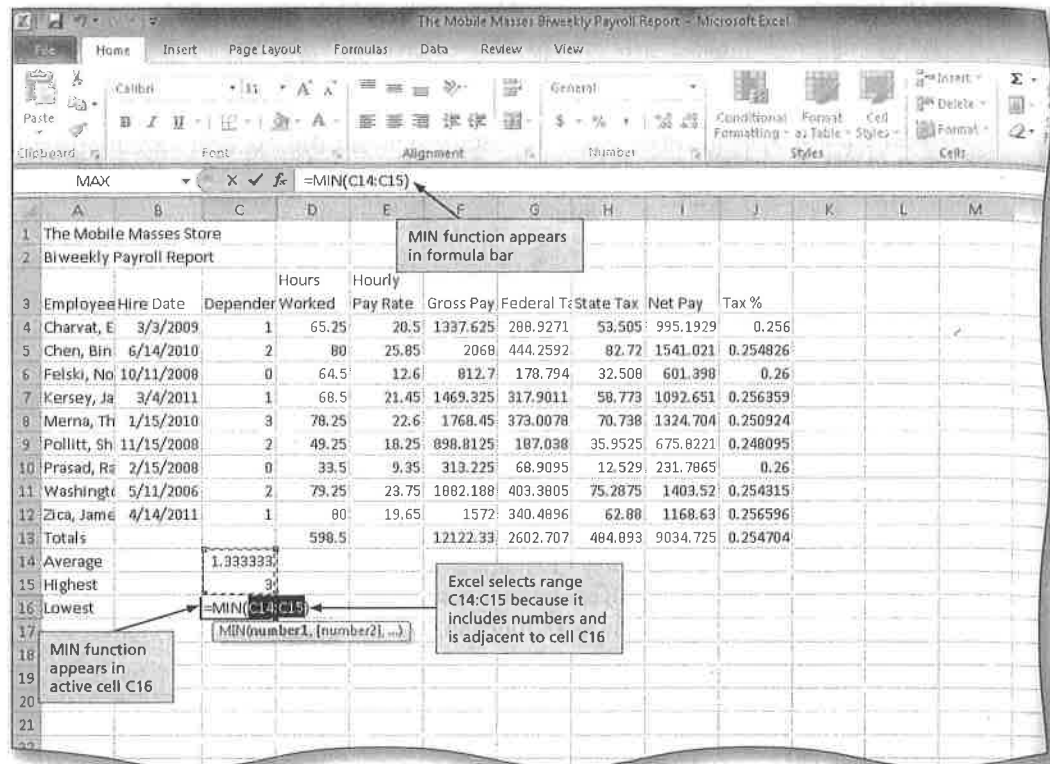

Figure 2–23

3

- Click cell C4 and then drag through cell C12 to display the function with the new range in the formula bar and in the selected cell (Figure 2–24).
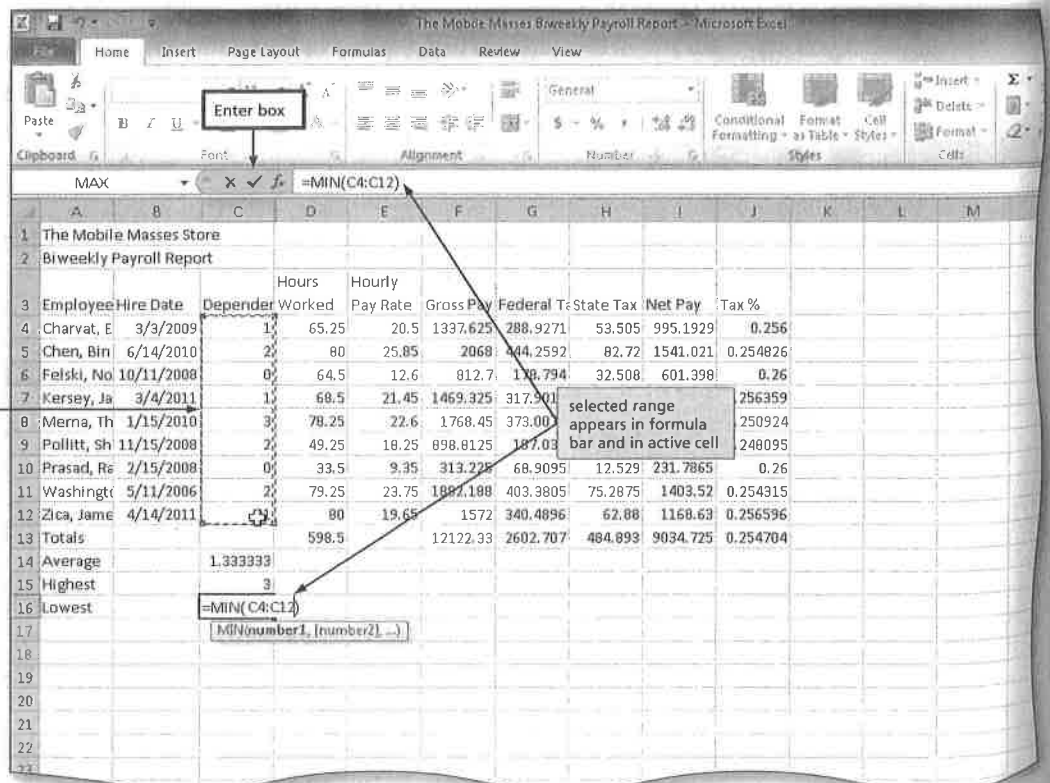
Figure 2–24

④

- Click the Enter box to determine the lowest value in the range C4:C12 and display the result in the formula bar and in the selected cell (Figure 2–25).

Q&A

How can I learn about other functions?

Excel has more than 400 additional functions that perform just about every type of calculation you can imagine. These functions are categorized in the Insert Function dialog box shown in Figure 2–19 on page EX 86. To view the

Figure 2–25

categories, click the 'Or select a category' box arrow. To obtain a description of a selected function, select its name in the Insert Function dialog box. Excel displays the description of the function below the Select a function list in the dialog box.
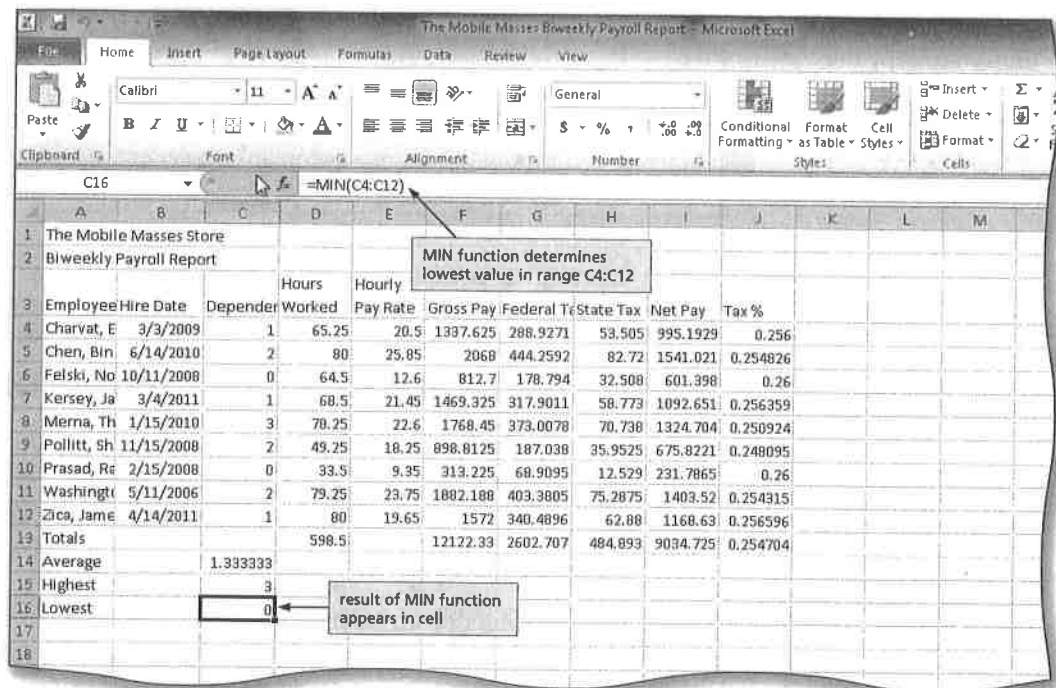
Other Ways

1. Click Insert Function box in the formula bar (if necessary, select Statistical category), click MIN

2. Click Sum button arrow (Formulas tab | Function Library group), click Min

3. Type =MIN in cell

To Copy a Range of Cells Across Columns to an Adjacent Range Using the Fill Handle

The next step is to copy the AVERAGE, MAX, and MIN functions in the range C14:C16 to the adjacent range D14:J16. The following steps use the fill handle to copy the functions.

①

- Select the source range from which to copy the functions, in this case C14:C16.

- Drag the fill handle in the lower-right corner of the selected range through cell J16 and continue to hold down the mouse button to begin a fill operation (Figure 2–26).
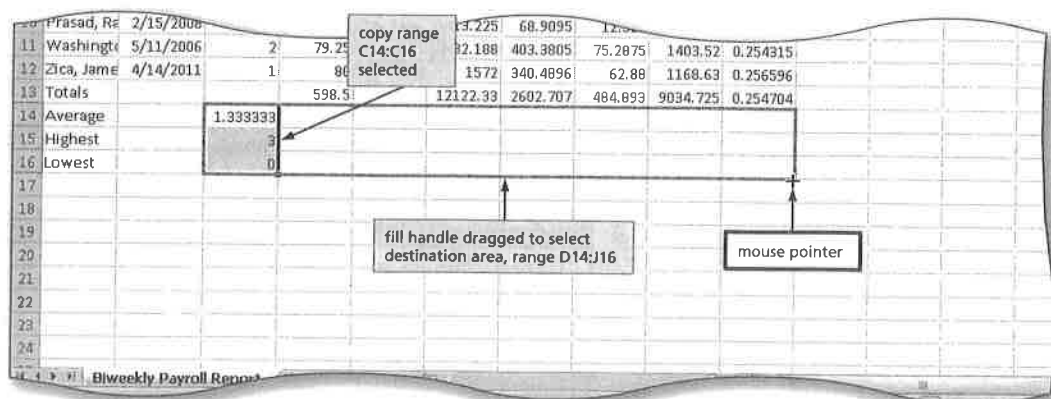

Figure 2–26

②

- Release the mouse button to copy the three functions to the selected range (Figure 2–27).

Figure 2–27

Q&A

How can I be sure that the function arguments are proper for the cells in range D14:J16?

Remember that Excel adjusts the cell references in the copied functions so that each function refers to the range of numbers above it in the same column. Review the numbers in rows 14 through 16 in Figure 2–27. You should see that the functions in each column return the appropriate values, based on the numbers in rows 4 through 12 of that column.

③

- Select cell J14 and then press the DELETE key to delete the average of the tax % (Figure 2–28).

Q&A

Why is the formula in cell J14 deleted?

The average of the tax % in cell J14 is deleted because an average of percentages of this type is mathematically invalid.

Figure 2–28

Other Ways

1. Select source area, click Copy button (Home tab | Clipboard group), select destination area, click Paste button (Home tab | Clipboard group)

2. Right-click source area, click Copy on shortcut menu, right-click destination area, click Paste icon on shortcut menu

3. Select source area and then point to border of range; while holding down CTRL, drag source area to destination area

4. Select source area, press CTRL+C, select destination area, press CTRL+V

To Save a Workbook Using the Same File Name

Earlier in this project, an intermediate version of the workbook was saved using the file name, The Mobile Masses Biweekly Payroll Report. The following step saves the workbook a second time, using the same file name.

1 Click the Save button on the Quick Access Toolbar to overwrite the previously saved file.

Break Point: If you wish to take a break, this is a good place to do so. You can quit Excel now. To resume at a later time, start Excel, open the file called Mobile Masses Biweekly Payroll Report, and continue following the steps from this location forward.

Verifying Formulas Using Range Finder

One of the more common mistakes made with Excel is to include a wrong cell reference in a formula. An easy way to verify that a formula references the cells you want it to reference is to use the Excel Range Finder. Use **Range Finder** to check which cells are referenced in the formula assigned to the active cell. Range Finder allows you to make immediate changes to the cells referenced in a formula.

To use Range Finder to verify that a formula contains the intended cell references, double-click the cell with the formula you want to check. Excel responds by highlighting the cells referenced in the formula so that you can check that the cell references are correct.

BTW

Entering Functions
You can drag the Function Arguments dialog box (Figure 2–20 on page EX 86) out of the way in order to select a range. You also can click the Collapse Dialog button to the right of the Number 1 box to hide the Function Arguments dialog box. The dialog box then collapses and the Collapse Dialog button becomes an Expand Dialog box button. After selecting the range, click the Expand Dialog to expand the dialog box.

To Verify a Formula Using Range Finder

The following steps use Range Finder to check the formula in cell J4.

1

• Double-click cell J4 to activate Range Finder (Figure 2–29).

2

• Press the ESC key to quit Range Finder and then click anywhere in the worksheet, such as cell A18, to deselect the current cell.

Figure 2–29

Formatting the Worksheet

Although the worksheet contains the appropriate data, formulas, and functions, the text and numbers need to be formatted to improve their appearance and readability.

In Excel Chapter 1, cell styles were used to format much of the worksheet. This section describes how to change the unformatted worksheet in Figure 2–30a to the formatted worksheet in Figure 2–30b using a theme and other commands on the Ribbon. The colors and fonts that are used in the worksheet shown in Figure 2–30b are those that are associated with the Trek theme.

(a) Unformatted Worksheet

(b) Formatted Worksheet
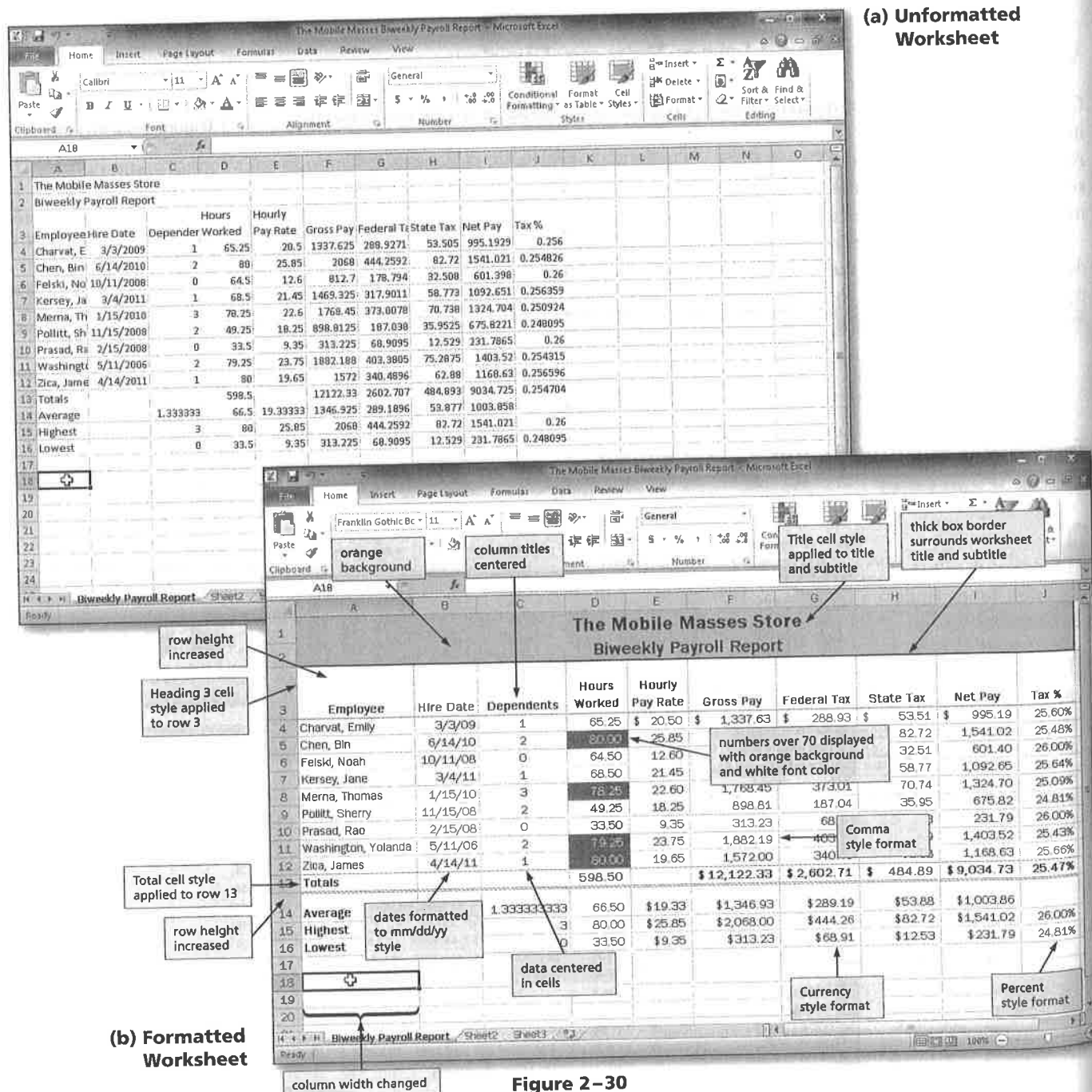
Figure 2–30

Identify how to format various elements of the worksheet.
As you have learned, applying proper formatting to a worksheet improves its appeal and readability. The following list includes additional worksheet formatting considerations.

- **Consider using cell borders and fill colors for various portions of the worksheet.** Cell borders, or box borders, draw a border around a cell or range of cells to set the cell or range off from other portions of the worksheet. For example, worksheet titles often include cell borders. Similarly, the use of a fill color in a cell or range of cells sets off the cell or range from other portions of the worksheet and provides visual impact to draw the user's eye toward the cell or range.

- **Use good judgment when centering values in columns.** If a cell entry is short, such as the dependents in column C, centering the entries within their respective columns improves the appearance of the worksheet.

- **Consider the use of a different theme.** A theme is a predefined set of colors, fonts, chart styles, cell styles, and fill effects that can be applied to an entire workbook. Every new workbook that you create is assigned a default theme named Office. Excel, however, includes a variety of other themes that provide a range of visual effects for your workbooks.

- **Apply proper formatting for cells that include dates.** Excel provides a number of date formats so that date values can be formatted to meet your needs. How you decide to format a date depends on a number of factors. For example, dates that include years both before and after the year 2000 should be formatted with a four-digit year. Your organization or department may insist on the use of certain standard date formats. Industry standards also may indicate how you should format date values.

The following outlines the formatting suggested in the sketch of the worksheet in Figure 2–3 on page EX 70.

1. Workbook theme — Trek
2. Worksheet title and subtitle
   a. Alignment — center across columns A through J
   b. Cell style — Title
   c. Font size — title 18; subtitle 16
   d. Background color (range A1:J2) — Orange Accent 1, Lighter 60%
   e. Border — thick box border around range A1:J2
3. Column titles
   a. Cell style — Heading 3
   b. Alignment — center
4. Data
   a. Dates in column B — mm/dd/yy format
   b. Alignment — center data in range C4:C12
   c. Numbers in column D — Comma style and two decimal places; if a cell in range D4:D12 is greater than 70, then cell appears with background color of orange and a font color of white
   d. Numbers in top row (range E4:I4) — Accounting number format
   e. Numbers below top row (range E5:I12) — Comma style and decimal places
5. Total line
   a. Cell style — Total
   b. Numbers — Accounting number format

6. Average, highest, and lowest rows
   a. Font style of row titles in range A14:A16 — bold
   b. Numbers — Currency style with floating dollar sign in the range E14:I16
7. Percentages in column J
   a. Numbers — Percentage style with two decimal places
8. Column widths
   a. Columns A, B, and C — best fit
   b. Column H — 10.22 characters
   c. Column D, E, and J — 7.56 characters
9. Row heights
   a. Row 3 — 48.00 points
   b. Row 14 — 27.00 points
   c. Remaining rows — default

To Change the Workbook Theme

The Trek theme includes fonts and colors that provide the worksheet a professional and subtly colored appearance. The following steps change the workbook theme to the Trek theme.

1

- Display the Page Layout tab.

- Click the Themes button (Page Layout tab | Themes group) to display the Themes gallery.

- Scroll to the bottom of the gallery (Figure 2–31).

Experiment

- Point to several themes in the Themes gallery to see a live preview of the themes.

Q&A

Why should I change the theme of a workbook?

A company or department may standardize on a specific theme so that all of their documents have a similar appearance. Similarly, an individual may want to have a theme that sets his or her work apart from the work of others. Other Office programs, such as Word and PowerPoint, include the same themes included with Excel, meaning that all of your Microsoft Office documents can share a common theme.
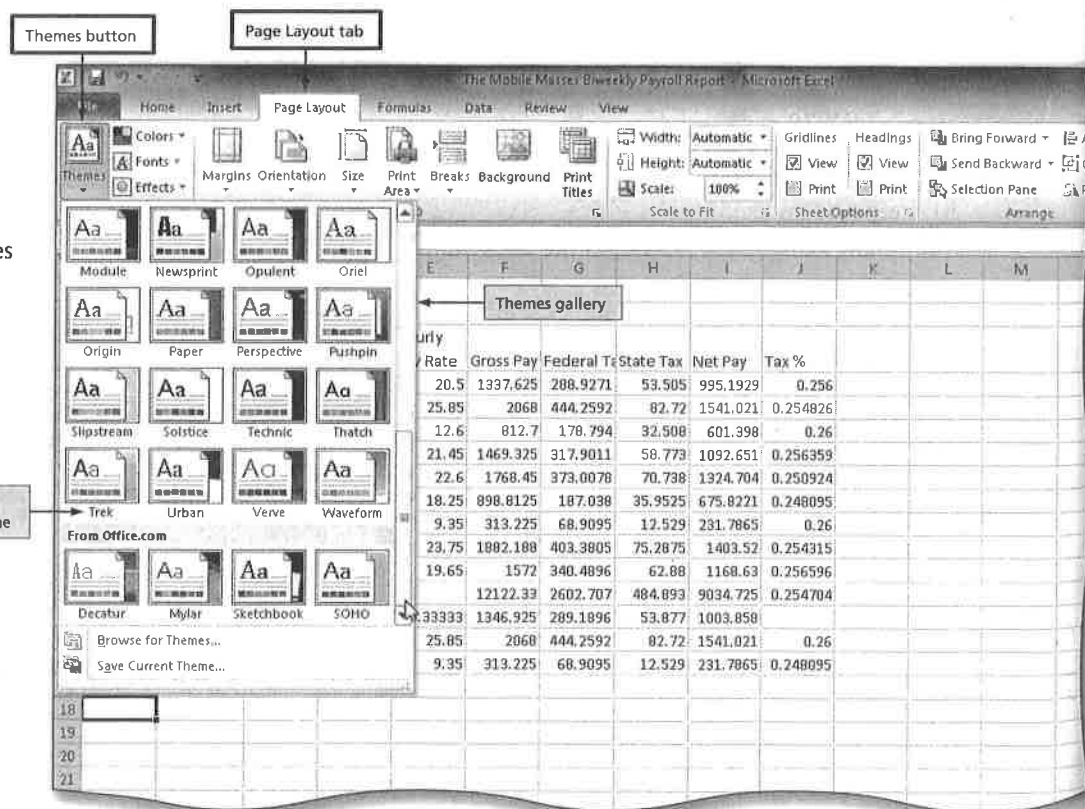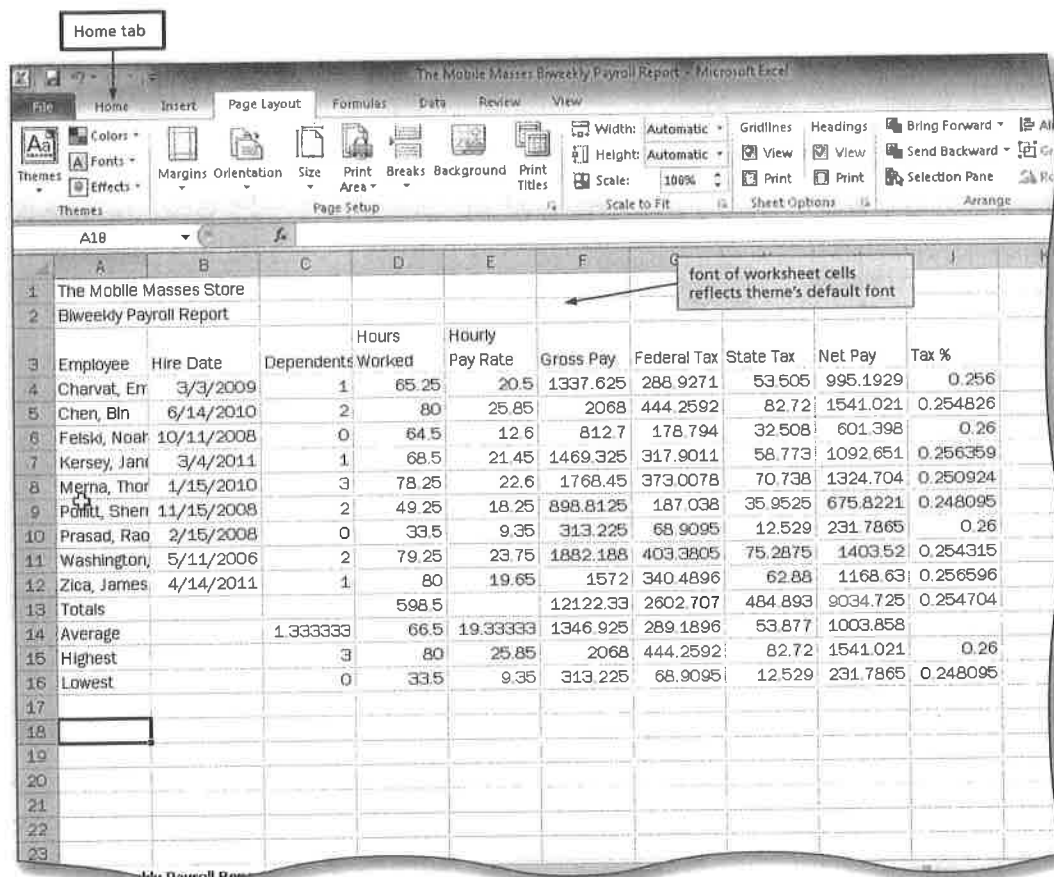

Figure 2–31

2

- Click Trek in the Themes gallery to change the workbook theme (Figure 2–32).

Figure 2–32

Q&A

Why did the cells in the worksheet change?

The cells in the worksheet originally were formatted with the default font for the default Office theme. The default font for the Trek theme is different from that of the default font for the Office theme and, therefore, changed on the worksheet when you changed the theme. If you had modified the font for any of the cells, those cells would not receive the default font for the Trek theme.

To Format the Worksheet Titles

The following steps merge and center the worksheet titles, apply the Title cells style to the worksheet titles, and decrease the font of the worksheet subtitle.

1 Display the Home tab.

2 Select the range to be merged, A1:J1 in this case, and then click the Merge & Center button (Home tab | Alignment group) to merge and center the text in the selected range.

3 Select the range A2:J2 and then click the Merge & Center button (Home tab | Alignment group) to merge and center the text in the selected range.

4 Select the range to contain the Title cell style, in this case A1:A2, click the Cell Styles button (Home tab | Styles group) to display the cell styles gallery, and then click the Title cell style in the Cell Styles gallery to apply the Title cell style to the selected range.

5 Select cell A2 and then click the Decrease Font Size button (Home tab | Font group) to decrease the font size of the selected cell to the next lowest font size (Figure 2–33 on the following page).

What is the effect of clicking the Decrease Font Size button?

When you click the Decrease Font Size button, Excel assigns the next lowest font size in the Font Size gallery to the selected range. The Increase Font Size button works in a similar manner but causes Excel to assign the next highest font size in the Font Size gallery to the selected range.

BTW

Color Selection
Knowing how people perceive colors helps you emphasize parts of your worksheet. Warmer colors (red and orange) tend to reach toward the reader. Cooler colors (blue, green, and violet) tend to pull away from the reader. Bright colors jump out of a dark background and are easiest to see. White or yellow text on a dark blue, green, purple, or black background is ideal.
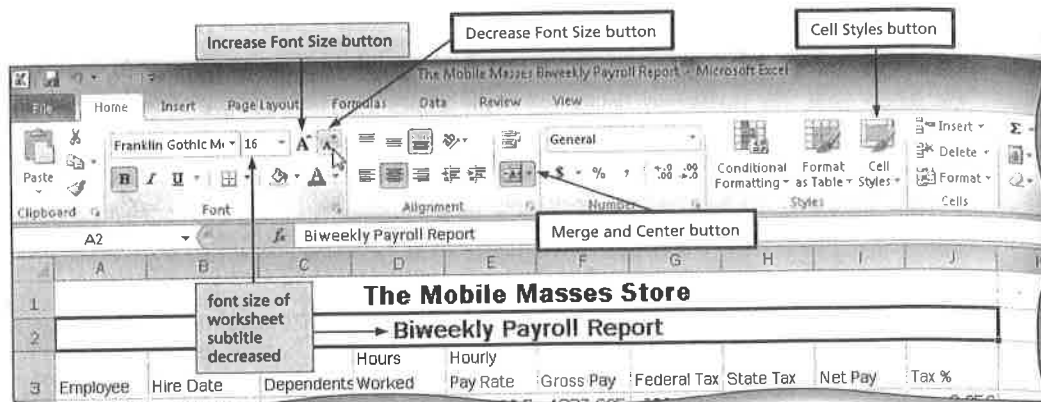
Figure 2–33

To Change the Background Color and Apply a Box Border to the Worksheet Title and Subtitle

The final formats assigned to the worksheet title and subtitle are the orange background color and thick box border (Figure 2–30b on page EX 92). The following steps complete the formatting of the worksheet titles.

1

- Select the range A1:A2 and then click the Fill Color button arrow (Home tab | Font group) to display the Fill Color gallery (Figure 2–34).

Experiment

- Point to a number of colors in the Fill Color gallery to display a live preview of the color in the range A1:A2.
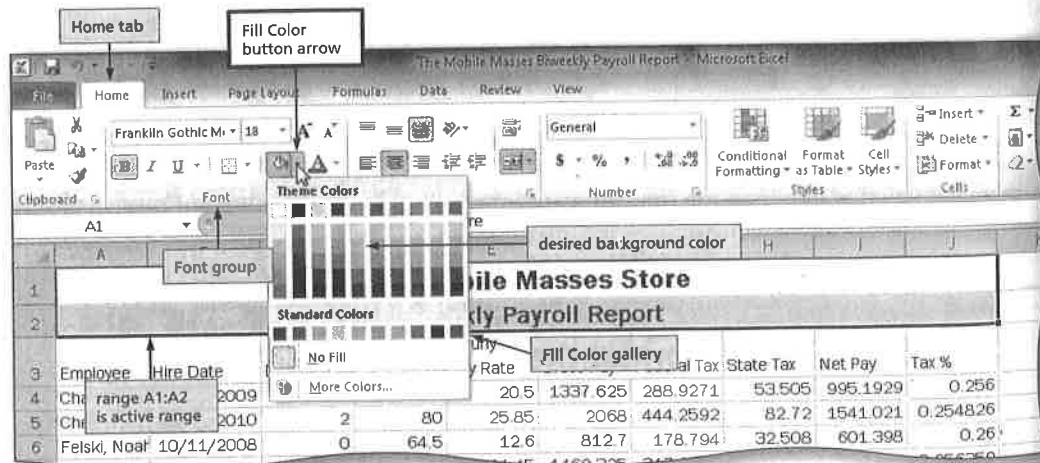
Figure 2–34

2

- Click Orange, Accent 1, Lighter 60% (column 5, row 3) in the Fill Color gallery to change the background color of the range of cells (Figure 2–35).
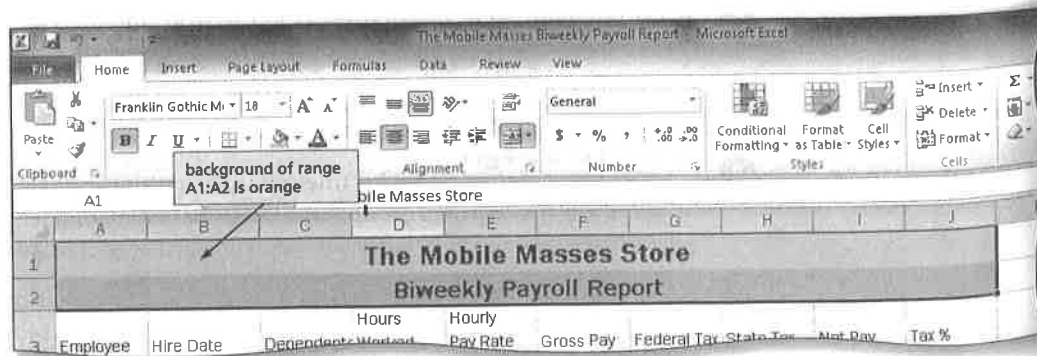

Figure 2–35

3

• Click the Borders button arrow (Home tab | Font group) to display the Borders list (Figure 2–36).
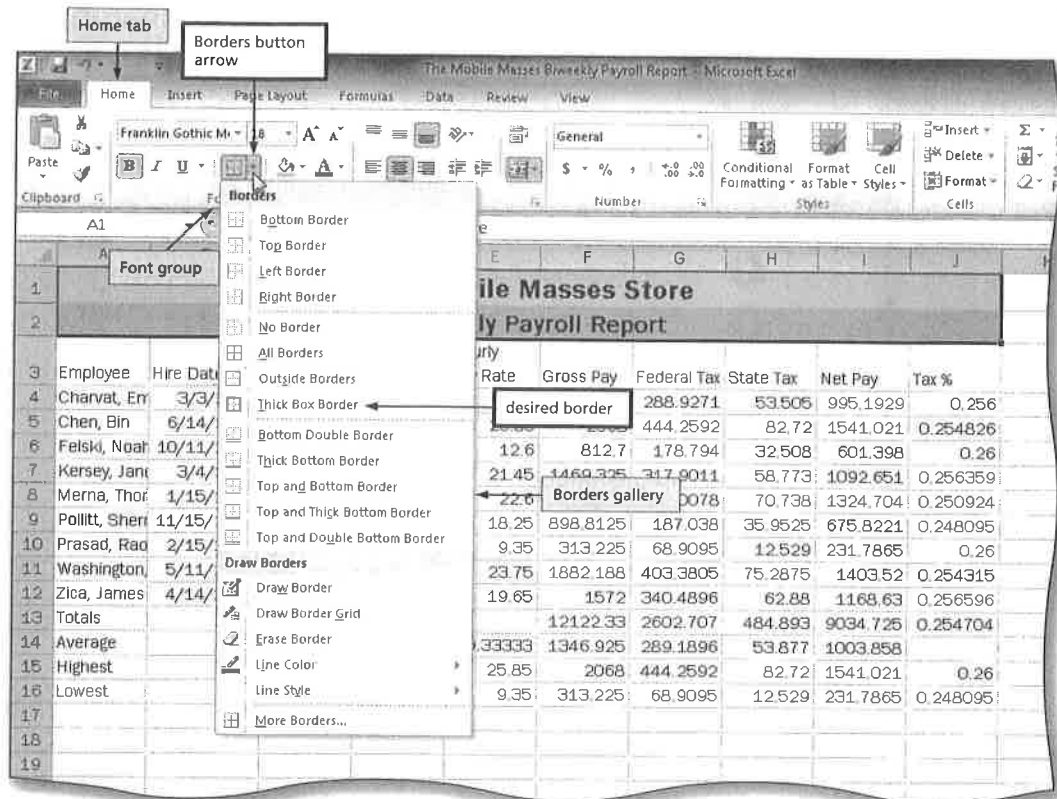

Figure 2–36

4

• Click Thick Box Border in the Borders list to display a thick box border around the selected range.

• Click anywhere in the worksheet, such as cell A18, to deselect the current range (Figure 2–37).
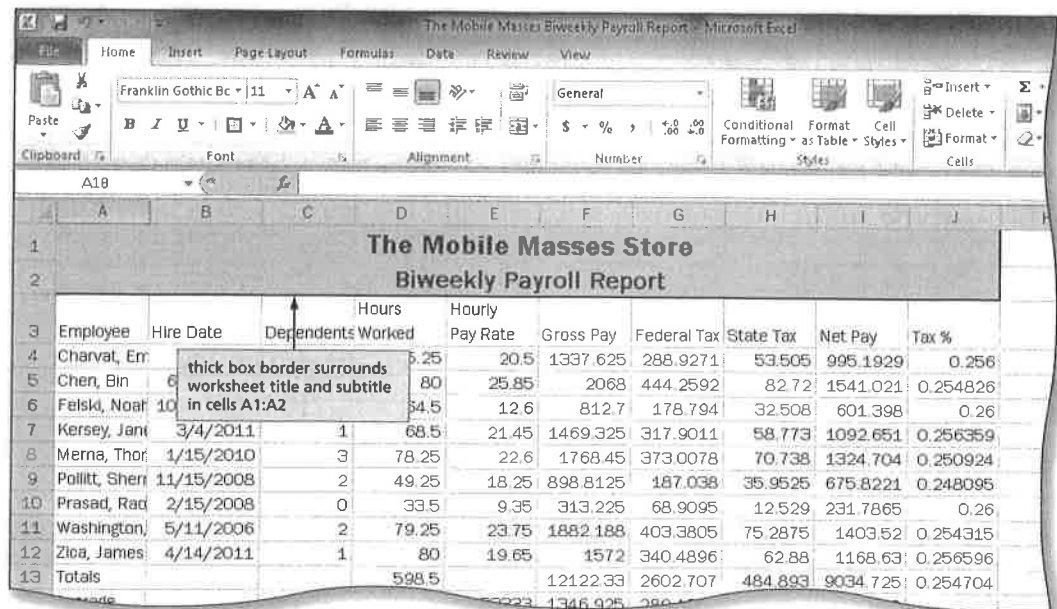

Figure 2–37

Other Ways

1. Click Format Cells Dialog Box Launcher (Home tab | Font group), click appropriate tab (Format Cells dialog box), click desired format, click OK button

2. Right-click range, click Format Cells on shortcut menu, click appropriate tab (Format Cells dialog box), click desired format, click OK button

3. Press CTRL+1, click appropriate tab (Format Cells dialog box), click desired format, click OK button

To Apply a Cell Style to the Column Headings and Format the Total Rows

As shown in Figure 2–30b on page EX 92, the column titles (row 3) should have the Heading 3 cell style and the totals row (row 13) should have the Total cell style. The summary information headings in the range A14:A16 should be bold. The following steps assign these styles and formats to row 3 and row 13 and the range A14:A16.

1 Select the range to be formatted, cells A3:J3 in this case.

2 Apply the Heading 3 cell style to the range A3:J3.

3 Click the Center button (Home tab | Alignment group) to center the column headings.

4 Apply the Total cell style to the range A13:J13.

5 Bold the range A14:A16 (Figure 2–38).
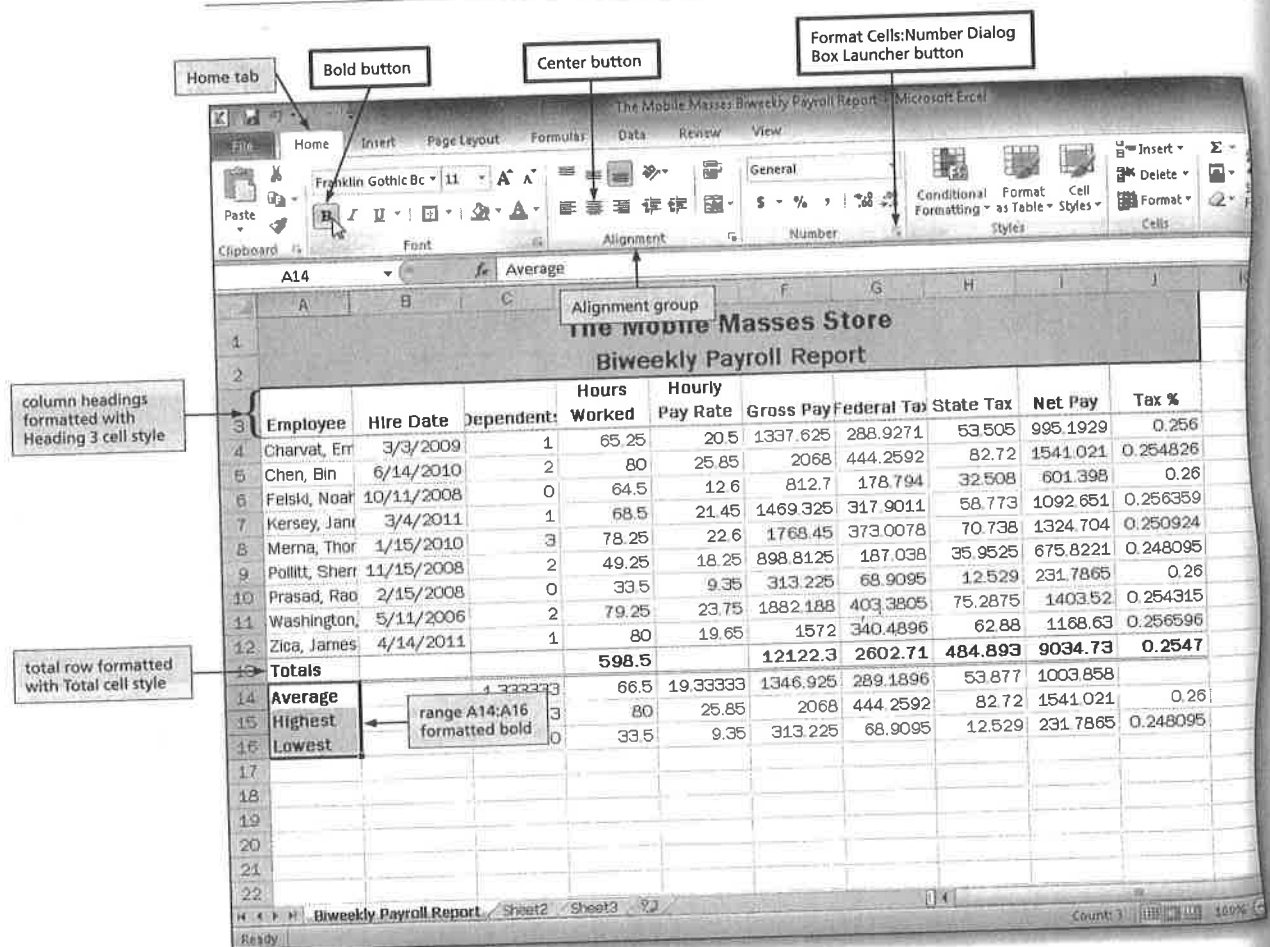
Figure 2–38

To Format Dates and Center Data in Cells

With the column titles and total rows formatted, the next step is to format the dates in column B and center the dependents in column C. The following steps format the dates in the range B4:B12 and center the data in the range C4:C12.

①

- Select the range to contain the new date format, cells B4:B12 in this case.

- Click the Format Cells: Number Dialog Box Launcher (Home tab | Number group) to display the Format Cells dialog box.

- If necessary, click the Number tab (Format Cells dialog box), click Date in the Category list, and then click 3/14/01 in the Type list to choose the format for the selected range (Figure 2–39).
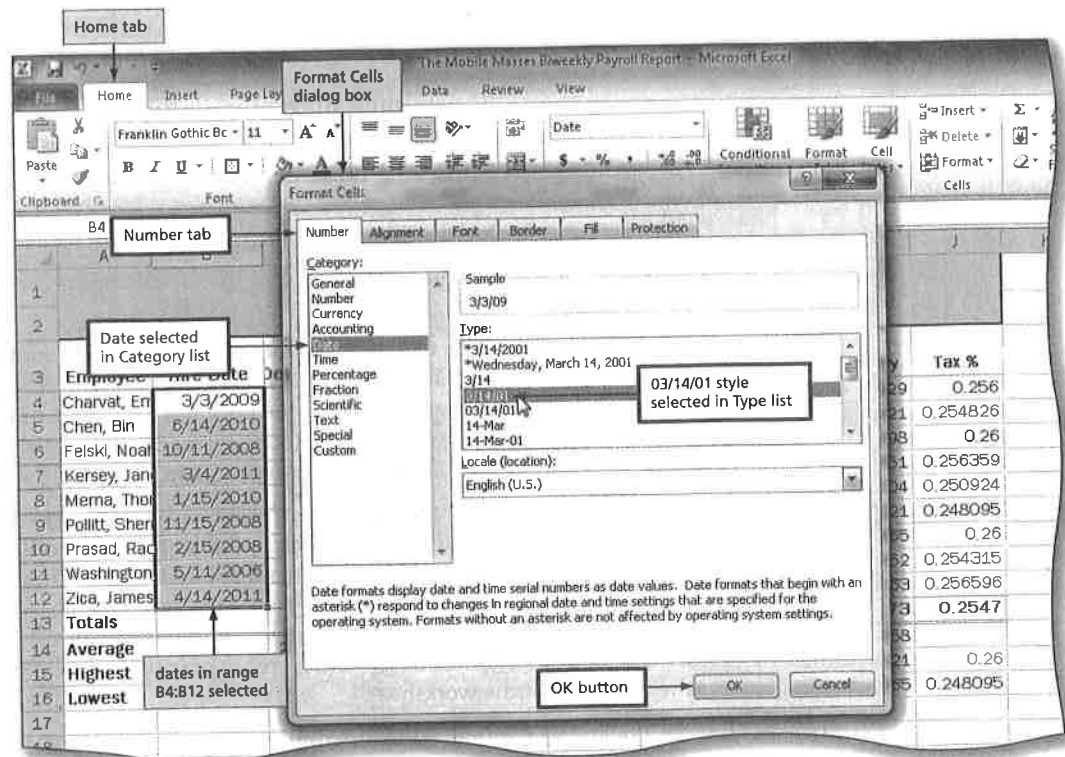

Figure 2–39

②

- Click the OK button (Format Cells dialog box) to format the dates in the current column using the selected date format style.

③

- Select the range C4:C12 and then click the Center button (Home tab | Alignment group) to center the data in the selected range.

- Select cell E4 to deselect the selected range (Figure 2–40).

Figure 2–40

Q&A

Can I format an entire column at once?

Yes. Rather than selecting the range B4:B12 in Step 1, you could have clicked the column B heading immediately above cell B1, and then clicked the Center button (Home tab | Alignment group). In this case, all cells in column B down to the last cell in the worksheet would have been formatted to use center alignment. This same procedure could have been used to format the dates in column C.

Other Ways

1. Right-click range, click Format Cells on shortcut menu, click appropriate tab (Format Cells dialog box), click desired format, click OK button

2. Press CTRL+1, click appropriate tab (Format Cells dialog box), click desired format, click OK button

Formatting Numbers Using the Ribbon

As shown in Figure 2–30b on page EX 92, the worksheet is formatted to resembl an accounting report. For example, in columns E through I, the numbers in the first r (row 4), the totals row (row 13), and the rows below the totals (rows 14 through 16) h; dollar signs, while the remaining numbers (rows 5 through 12) in column E through column I do not.

Plan Ahead

> **Determine proper formatting for cells that include currency and other numeric amounts.**
>
> - To append a dollar sign to a number, you should use the Accounting number format. Exc displays numbers using the **Accounting number format** with a dollar sign to the left of the number, inserts a comma every three positions to the left of the decimal point, and displays numbers to the nearest cent (hundredths place). Clicking the Accounting Numbe Format button (Home tab | Number group) assigns the desired Accounting number forma
>
> - When you use the Accounting Number Format button to assign the Accounting number format, Excel displays a **fixed dollar sign** to the far left in the cell, often with spaces between it and the first digit. To assign a **floating dollar sign** that appears immediately to the left of the first digit with no spaces, use the Currency style (Format Cells dialog box). Whether you use the Accounting number format or the Currency style format depends on a number of factors, including the preference of your organization, industry standards, an the aesthetics of the worksheet.
>
> - The Comma style format is used to instruct Excel to display numbers with commas and no dollar signs. The **Comma style format**, which can be assigned to a range of cells by clicking th Comma Style button (Home tab | Number group), inserts a comma every three positions to the left of the decimal point and causes numbers to be displayed to the nearest hundredths.

To Apply an Accounting Number Format and Comma Style Format Using the Ribbo

The following steps assign formats using the Accounting Number Format button and the Comma Style button (Home tab | Number group). The Accounting Number format is applied to the currency amounts in rows and 13. The Comma style is applied to the range E4:I12 and to column D (Hours Worked).

1

- Select the range to contain the Accounting Number Format, cells E4:I4 in this case.

- While holding down the CTRL key, select the range F13:I13 to select the nonadjacent range.

- Click the Accounting Number Format button (Home tab | Number group) to apply the Accounting number format with fixed dollar signs to the selected nonadjacent ranges (Figure 2–41).

Q&A

What is the effect of applying the Accounting number format?

The Accounting Number Format button assigns a fixed dollar sign to the numbers in the ranges E4:I4 and F13:I13. In each cell in these ranges, Excel displays the dollar sign to the far left with spaces between it and the first digit in the cell.

Figure 2–41

2

- Select the range to contain the Comma style format, cells E5:I12 in this case.

- Click the Comma Style button (Home tab | Number group) to assign the Comma style format to the selected range (Figure 2–42).
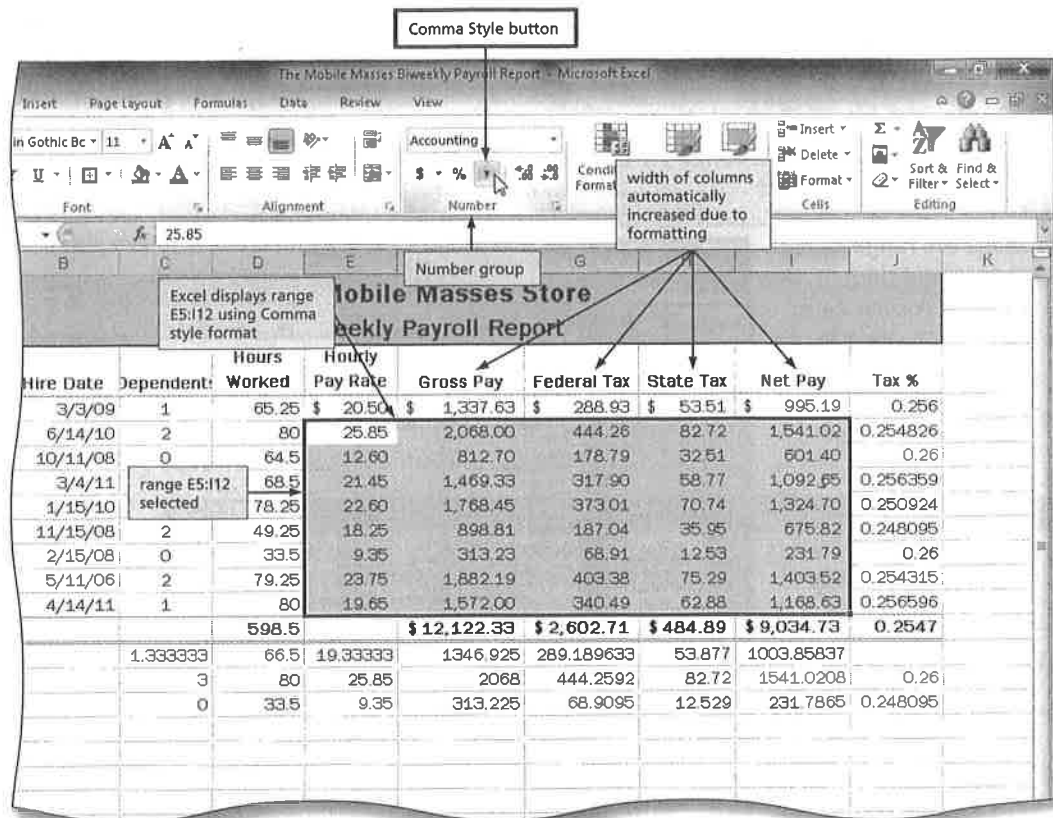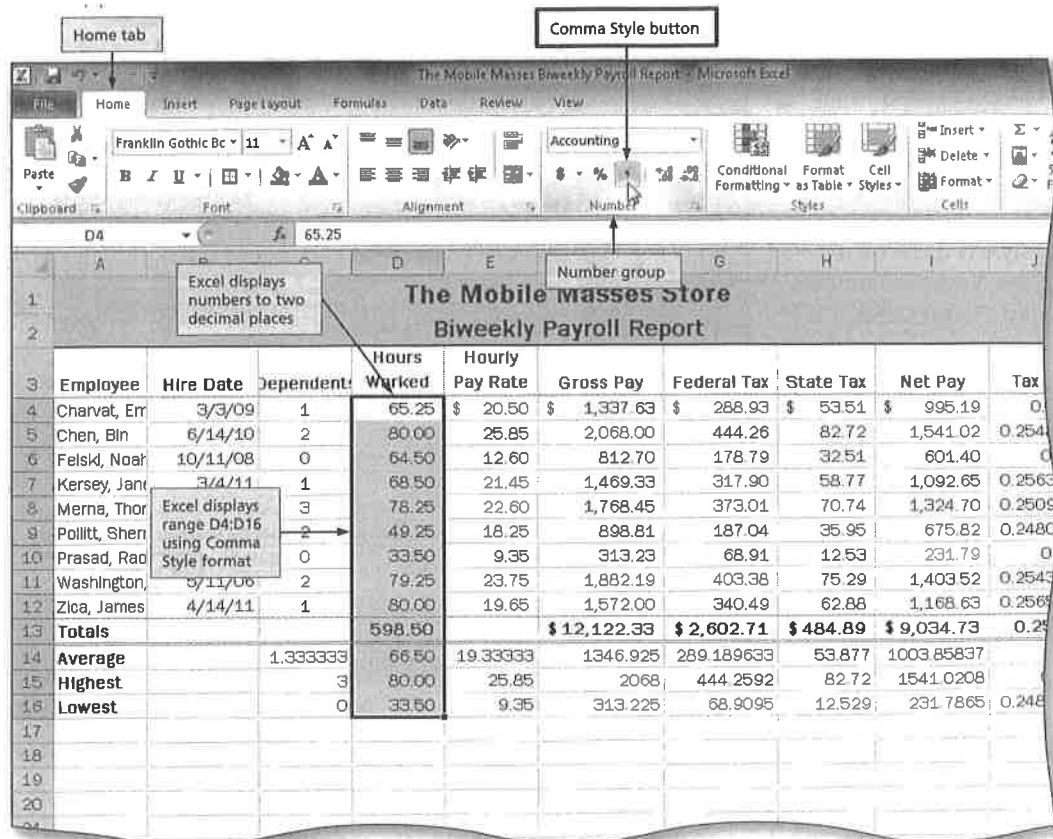

Figure 2–42

3

- Select the range to contain the Comma style format, cells D4:D16 in this case.

- Click the Comma Style button (Home tab | Number group) to assign the Comma style format to the selected range (Figure 2–43).

Figure 2–43

To Apply a Currency Style Format with a Floating Dollar Sign Using the Format Cells Dialog Box

The following steps use the Format Cells dialog box to apply the Currency style format with a floating dollar sign to the numbers in the range E14:I16.

1

- Select the range E14:I16 and then click the Format Cells: Number Dialog Box Launcher (Home tab | Number group) to display the Format Cells dialog box.

- If necessary, click the Number tab (Format Cells dialog box) to display the Number tab (Format Cells dialog box) (Figure 2–44).
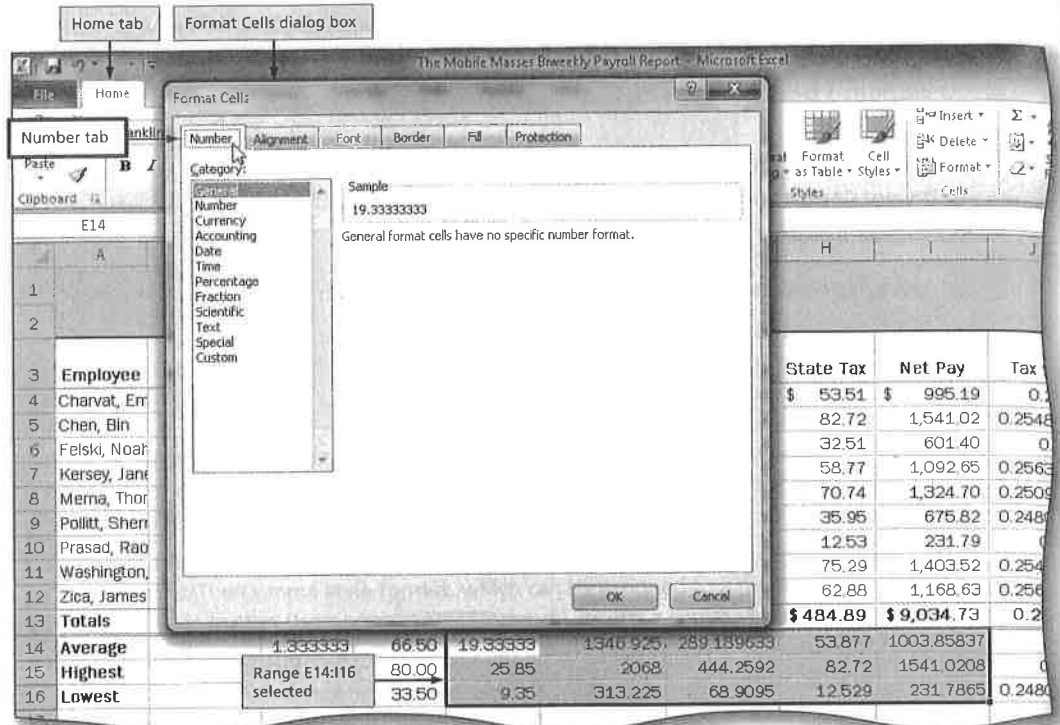

Figure 2–44

2

- Click Currency in the Category list to select the necessary number format category, and then click the third style ($1,234.10) in the Negative numbers list (Format Cells dialog box) to select the desired currency format for negative numbers (Figure 2–45).
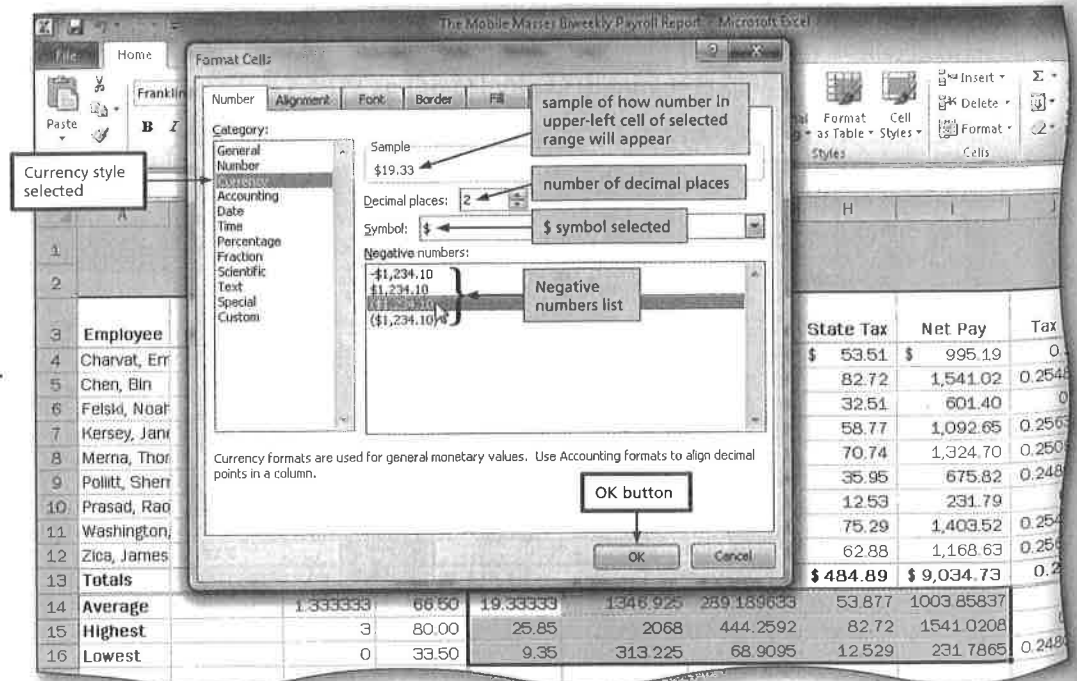
Q&A

How do I select the proper format?

You can choose from 12 categories of formats. Once you select a category, you can select the number of decimal places, whether or not a dollar sign should be displayed, and how negative numbers should appear. Selecting the appropriate negative numbers format is important, because doing so adds a space to the right of the number in order to align the numbers in the worksheet on the decimal points. Some of the available negative number formats do not align the numbers in the worksheet on the decimal points.

Figure 2–45

③

- Click the OK button (Format Cells dialog box) to assign the Currency style format with a floating dollar sign to the selected range (Figure 2–46).

Q&A What is the difference between using the Accounting Number style and Currency style?

When using the Accounting Number Style button, recall that a floating dollar sign always appears immediately to the left of the first digit, and the fixed dollar sign always appears on the left side of the cell. Cell E4, for example, has a fixed dollar sign, while cell E14 has a floating dollar sign. The Currency style was assigned to cell E14 using the Format Cells dialog box and the result is a floating dollar sign.

Figure 2–46

Other Ways

1. Press CTRL+1, click Number tab (Format Cells dialog box), click Currency

in Category list, select format, click OK button

2. Press CTRL+SHIFT+DOLLAR SIGN ($)

To Apply a Percent Style Format and Use the Increase Decimal Button

The next step is to format the tax % in column J. Currently, Excel displays the numbers in column J as a decimal fraction (for example, 0.256 in cell J4). The following steps format the range J4:J16 to the Percent style format with two decimal places.

①

- Select the range to format, cell J4:J16 in this case.

- Click the Percent Style button (Home tab | Number group) to display the numbers in the selected range as a rounded whole percent.

Q&A What is the result of clicking the Percent Style button?

The Percent Style button instructs Excel to display a value as a percentage, determined by multiplying the cell entry by 100, rounding the result to the nearest percent, and adding a percent sign. For example, when cell J4 is formatted using the Percent Style buttons, Excel displays the actual value 0.256 as 26%.

②

- Click the Increase Decimal button (Home tab | Number group) two times to display the numbers in the selected range with two decimal places (Figure 2–47).

Figure 2–47

Other Ways

1. Right-click range, click Format Cells on shortcut menu, click Number tab (Format Cells dialog box), click Percentage

in Category list, select format, click OK button

2. Press CTRL+1, click Number tab (Format Cells dialog box), click Percentage

in Category list, select format, click OK button

3. Press CTRL+SHIFT+ percent sign (%)

Conditional Formatting

The next step is to emphasize the values greater than 70 in column D by formatting them to appear with an orange background and white font color (Figure 2–48).

Plan Ahead

Establish rules for conditional formatting.

- Excel lets you apply formatting that appears only when the value in a cell meets conditions that you specify. This type of formatting is called **conditional formatting**. You can apply conditional formatting to a cell, a range of cells, the entire worksheet, or the entire workbook. Usually, you apply conditional formatting to a range of cells that contains values you want to highlight, if conditions warrant.

- A **condition**, which is made up of two values and a relational operator, is true or false for each cell in the range. If the condition is true, then Excel applies the formatting. If the condition is false, then Excel suppresses the formatting. What makes conditional formatting so powerful is that the cell's appearance can change as you enter new values in the worksheet.

- As with worksheet formatting, follow the less-is-more rule when considering conditional formatting. Use conditional formatting to make cells and ranges stand out and raise attention. Too much conditional formatting can result in confusion for the reader of the worksheet.

To Apply Conditional Formatting

The following steps assign conditional formatting to the range D4:D12, so that any cell value greater than 70 will cause Excel to display the number in the cell with an orange background and a white font color.

1

- Select the range D4:D12.

- Click the Conditional Formatting button (Home tab | Styles group) to display the Conditional Formatting list (Figure 2–48).
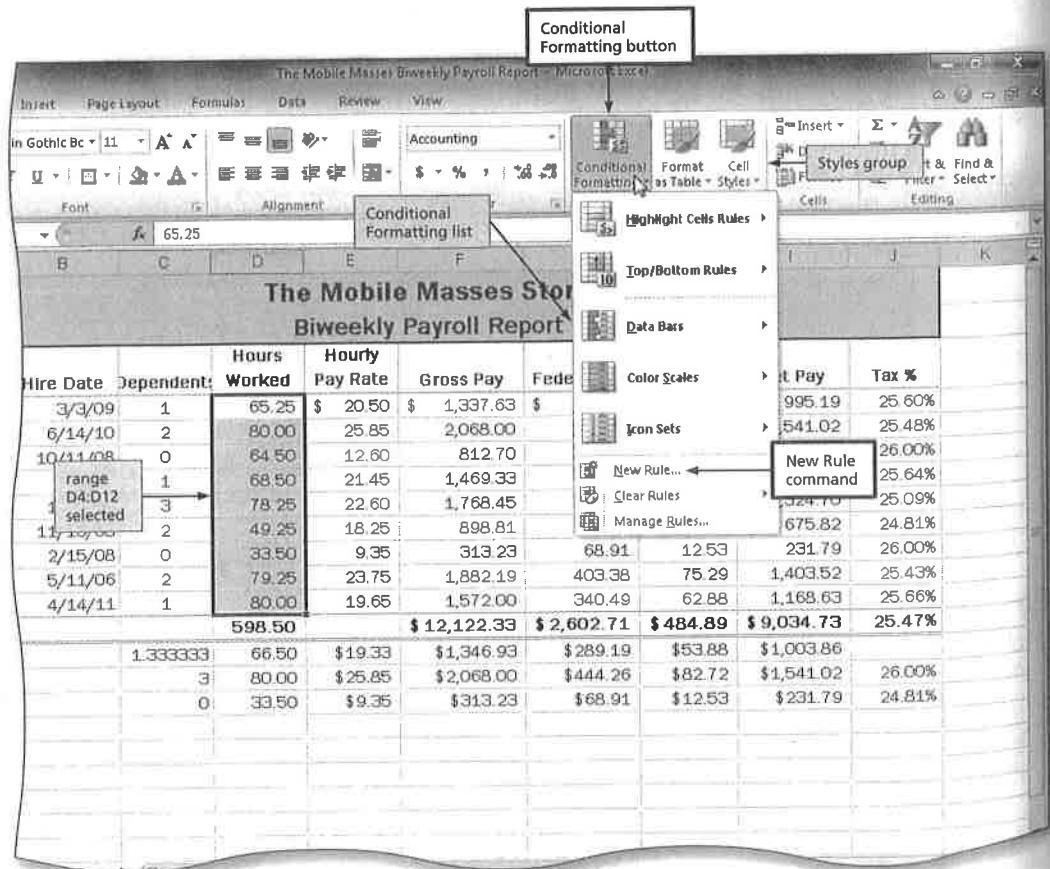
Figure 2–48

2

- Click New Rule in the Conditional Formatting list to display the New Formatting Rule dialog box.

- Click 'Format only cells that contain' in the Select a Rule Type area (New Formatting Rule dialog box) to change the 'Edit the Rule Description' area.

- In the 'Edit the Rule Description' area, click the box arrow in the relational operator box (second text box) to display a list of relational operators, and then select greater than to select the desired operator.
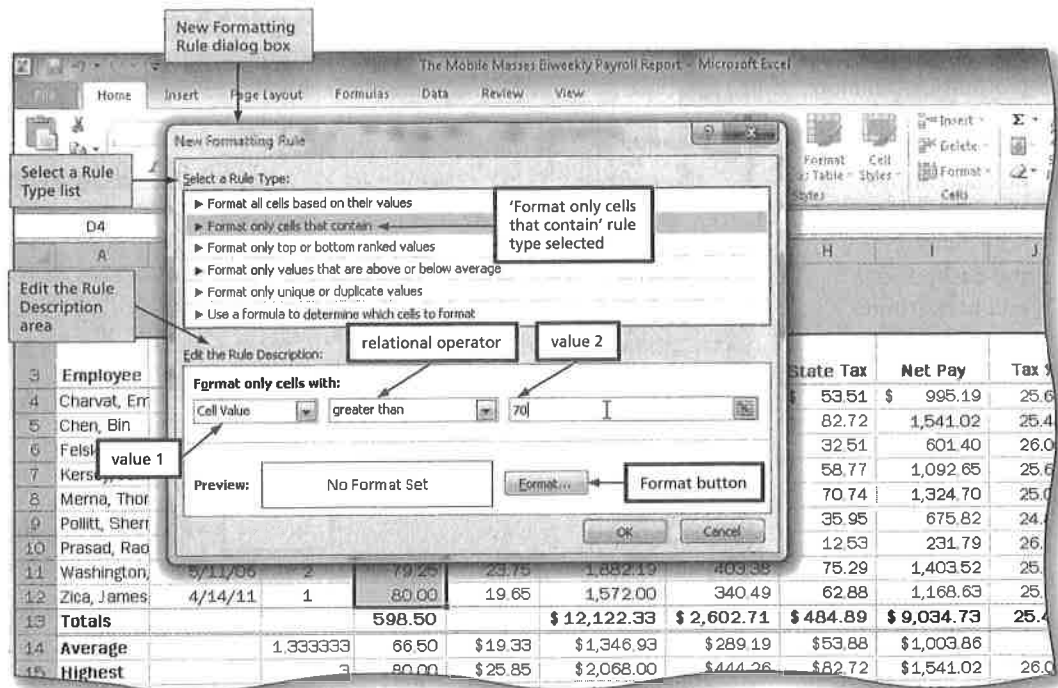
- Select the rightmost box, and then type 70 in the box in the 'Edit the Rule Description' area to enter the second value of the rule description (Figure 2–49).

Figure 2–49

What do the changes in the 'Edit the Rule Description' indicate?

The 'Edit the Rule Description' area allows you to view and edit the rules for the conditional format. In this case, reading the area indicates that Excel should conditionally format only cells with cell values greater than 70.

3

- Click the Format button (New Formatting Rule dialog box) to display the Format Cells dialog box.

- If necessary, click the Font tab. Click the Color box arrow (Format Cells dialog box) to display the Color gallery and then click White, Background 1 (column 1, row 1) in the Color gallery to select the font color.

- Click the Fill tab (Format Cells dialog box) to display the Fill sheet and then click the orange color in column 5, row 5 to select the background color (Figure 2–50).
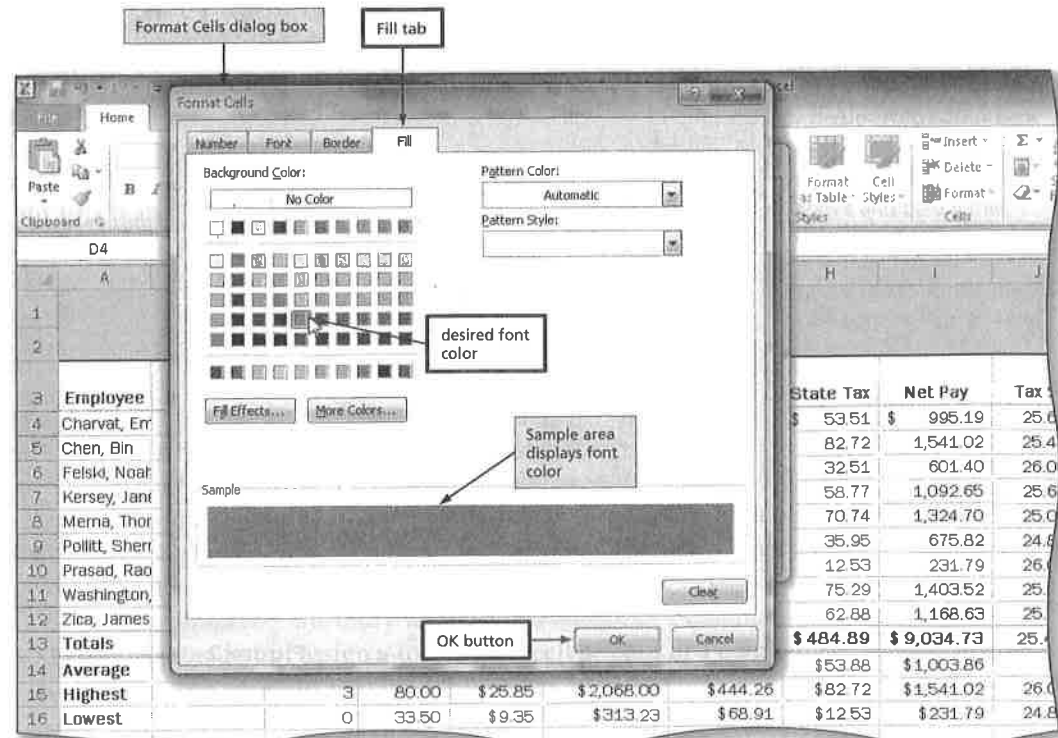
Figure 2–50

4

- Click the OK button (Format Cells dialog box) to close the Format Cells dialog box and display the New Formatting Rule dialog box with the desired font and background colors displayed in the Preview box (Figure 2–51).
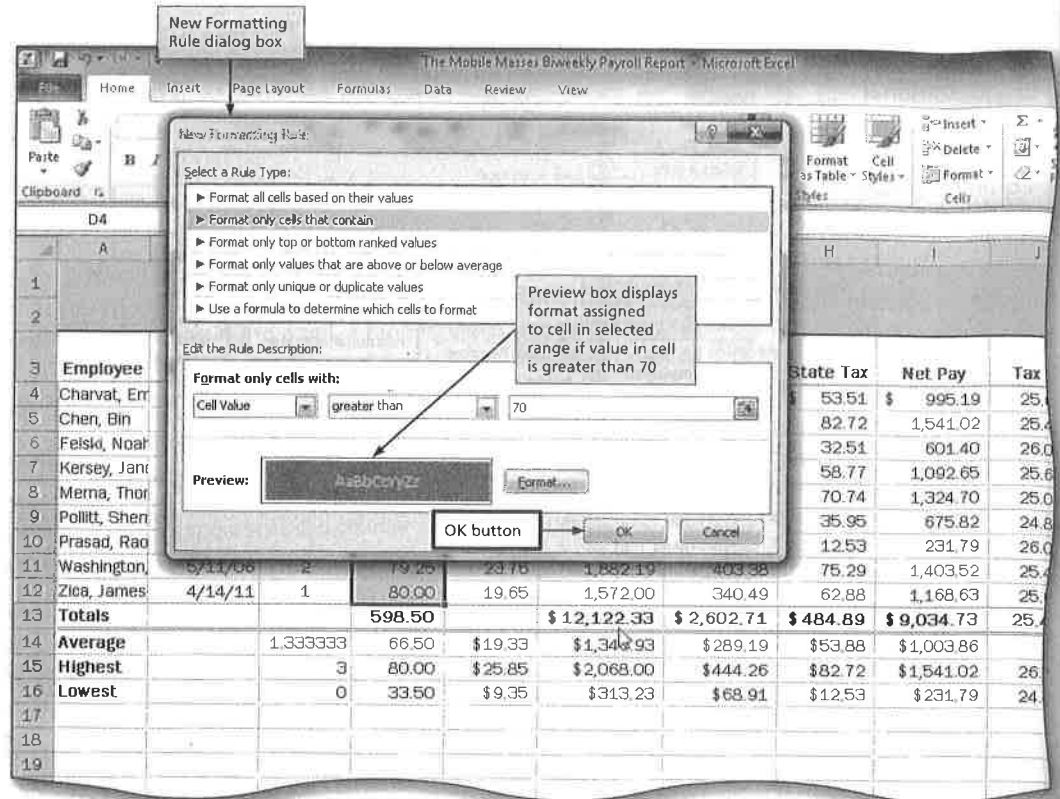
Figure 2–51

5

- Click the OK button to assign the conditional format to the selected range.

- Click anywhere in the worksheet, such as cell A18, to deselect the current range (Figure 2–52).

Figure 2–52

Conditional Formatting Operators

As shown in Figure 2–49 on page EX 105, the second text box in the New Formatting Rule dialog box allows you to select a relational operator, such as less than, to use in the condition. The eight different relational operators from which you can choose for conditional formatting in the New Formatting Rule dialog box are summarized in Table 2–5.

| Table 2–5 Summary of Conditional Formatting Relational Operators	
Relational Operator	**Description**
between	Cell value is between two numbers.
not between	Cell value is not between two numbers.
equal to	Cell value is equal to a number.
not equal to	Cell value is not equal to a number.
greater than	Cell value is greater than a number.
less than	Cell value is less than a number.
greater than or equal to	Cell value is greater than or equal to a number.
less than or equal to	Cell value is less than or equal to a number.

Changing the Widths of Columns and Heights of Rows

When Excel starts and displays a blank worksheet on the screen, all of the columns have a default width of 8.43 characters, or 64 pixels. These values may change depending on the theme applied to the workbook. For example, in this chapter, the Trek theme was applied to the workbook, resulting in columns having a default width of 8.11 characters. A character is defined as a letter, number, symbol, or punctuation mark in 11-point Calibri font, the default font used by Excel. An average of 8.43 characters in 11-point Calibri font will fit in a cell.

Another measure of the height and width of cells is pixels, which is short for picture element. A **pixel** is a dot on the screen that contains a color. The size of the dot is based on your screen's resolution. At the resolution of 1024 × 768 used in the Office and Windows chapters in this book, 1024 pixels appear across the screen and 768 pixels appear down the screen for a total of 786,432 pixels. It is these 786,432 pixels that form the font and other items you see on the screen.

The default row height in a blank worksheet is 15 points (or 20 pixels). Recall from Excel Chapter 1 that a point is equal to 1/72 of an inch. Thus, 15 points is equal to about 1/5 of an inch. You can change the width of the columns or height of the rows at any time to make the worksheet easier to read or to ensure that Excel displays an entry properly in a cell.

BTW

Hidden Rows and Columns
For some people, trying to unhide a range of columns using the mouse can be frustrating. An alternative is to use the keyboard: select the columns to the right and left of the hidden columns and then press CTRL+SHIFT+) (RIGHT PARENTHESIS). To use the keyboard to hide a range of columns, press CTRL+0 (ZERO). You also can use the keyboard to unhide a range of rows by selecting the rows immediately above and below the hidden rows and then pressing CTRL+SHIFT+((LEFT PARENTHESIS). To use the keyboard to hide a range of rows, press CTRL+9.

To Change the Widths of Columns

When changing the column width, you can set the width manually or you can instruct Excel to size the column to best fit. **Best fit** means that the width of the column will be increased or decreased so that the widest entry will fit in the column. Sometimes, you may prefer more or less white space in a column than best fit provides. To change the white space, Excel allows you to change column widths manually.

When the format you assign to a cell causes the entry to exceed the width of a column, Excel automatically changes the column width to best fit. If you do not assign a format to a cell or cells in a column, the column width will remain 8.43 characters. To set a column width to best fit, double-click the right boundary of the column heading above row 1.

The steps on the following pages change the column widths: column A, B, and C to best fit; column H to 10.22 characters; and columns D, E, and J to 7.56 characters.

1

- Drag through column headings A, B, and C above row 1 to select the columns.

- Point to the boundary on the right side of column heading C to cause the mouse pointer to become a split double arrow (Figure 2–53).

Q&A

What if I want to make a large change to the column width?

If you want to increase or decrease column width significantly, you can right-click a column heading and then use the Column Width command on the shortcut menu to change the column's width. To use this command, however, you must select one or more entire columns.
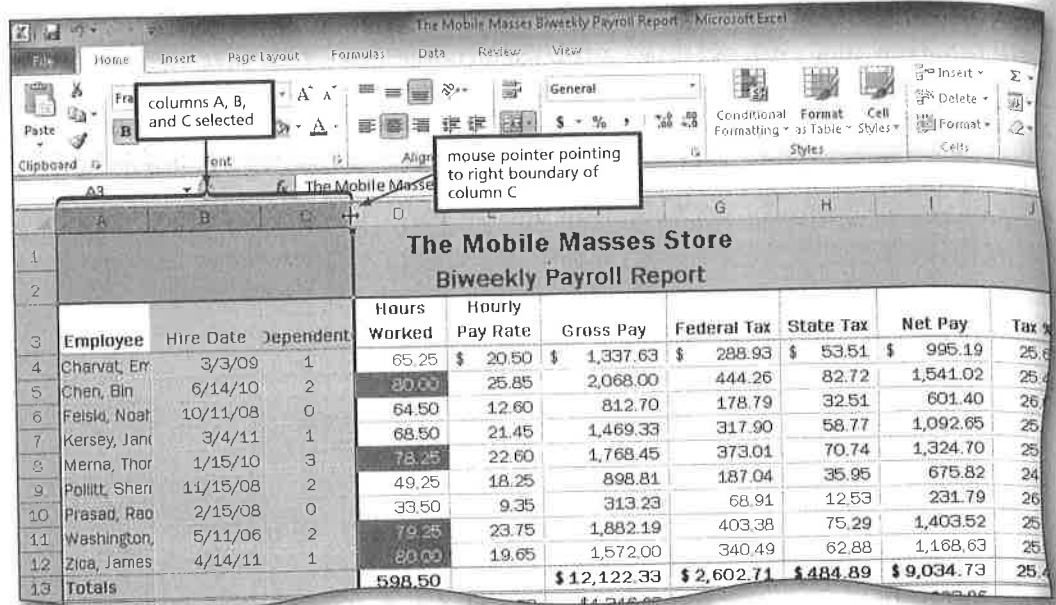
Figure 2–53

2

- Double-click the right boundary of column heading C to change the width of the selected columns to best fit.

- Point to the boundary on the right side of the column H heading above row 1.

- When the mouse pointer changes to a split double arrow, drag until the ScreenTip indicates Width: 10.22 (99 pixels). Do not release the mouse button (Figure 2–54).

Q&A

What happens if I change the column width to zero (0)?

If you decrease the column width to 0, the column is hidden. **Hiding cells** is a technique you can use to hide data that might not be relevant to a particular report or sensitive data that you do not want others to see. To instruct Excel to display a hidden column, position the mouse pointer to the right of the column heading boundary where the hidden column is located and then drag to the right.
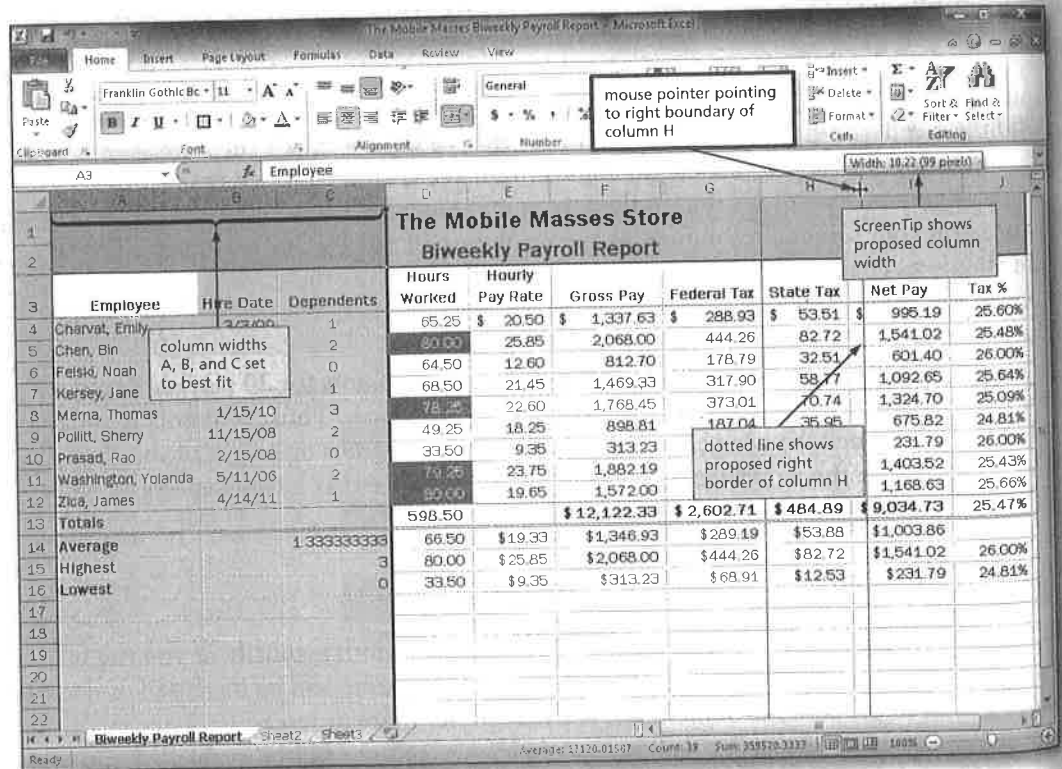
Figure 2–54

3

- Release the mouse button to change the column width.

- Click the column D heading above row 1 to select the column.

- While holding down the CTRL key, click the column E heading and then the column J heading above row 1 so that nonadjacent columns are selected (Figure 2–55).

Figure 2–55

4

- If necessary, scroll the worksheet to the right so that the right border of column J is visible. Point to the boundary on the right side of the column J heading above row 1.

- Drag until the ScreenTip indicates Width: 7.56 (75 pixels). Do not release the mouse button (Figure 2–56).

Figure 2–56

⑤

- Release the mouse button to change the column widths.

- If necessary, scroll the worksheet to the left so that the left border of column A is visible.

- Click anywhere in the worksheet, such as cell A18, to deselect the columns (Figure 2–57).

Other Ways

1. Right-click column heading or drag through multiple column headings and right-click, click Column Width on shortcut menu, enter desired column width, click OK button

Figure 2–57

To Change the Heights of Rows

When you increase the font size of a cell entry, such as the title in cell A1, Excel automatically increases the row height to best fit so that it can display the characters properly. Recall that Excel did this earlier when multiple lines were entered in a cell in row 3, and when the cell style of the worksheet title and subtitle was changed.

You also can increase or decrease the height of a row manually to improve the appearance of the worksheet. The following steps improve the appearance of the worksheet by increasing the height of row 3 to 48.00 points and increasing the height of row 14 to 27.00 points.

①

- Point to the boundary below row heading 3.

- Drag down until the ScreenTip indicates Height: 48.00 (64 pixels). Do not release the mouse button (Figure 2–58).

Figure 2–58

2

- Release the mouse button to change the row height.

- Point to the boundary below row heading 14.

- Drag down until the ScreenTip indicates Height: 27.00 (36 pixels). Do not release the mouse button (Figure 2–59).

ScreenTip shows proposed height of row 14

mouse pointer

row 3 height is 48.00 points

current bottom border of row 14

dotted line shows proposed bottom border of row 14

Figure 2–59

3

- Release the mouse button to change the row height.

- Click anywhere in the worksheet, such as cell A18, to deselect the current cell (Figure 2–60).

Q&A

Can I hide a row?

Yes. As with column widths, when you decrease the row height to 0, the row is hidden. To instruct Excel to display a hidden row, position the mouse pointer just below the row heading boundary where the row is hidden and then drag down. To set a row height to best fit, double-click the bottom boundary of the row heading.

formatting of worksheet complete

row 14 height is 27.00 points

added white space in row 14 improves appearance of worksheet

Figure 2–60

Other Ways

1. Right-click row heading or drag through multiple row headings and right-click, click Row Height

   on shortcut menu, enter desired row height, click OK button

Break Point: If you wish to take a break, this is a good place to do so. Be sure to save the The Mobile Masses Biweekly Payroll Report file again and then you can quit Excel. To resume at a later time, start Excel, open the file called The Mobile Masses Biweekly Payroll Report and continue following the steps from this location forward.

Checking Spelling

Excel includes a **spell checker** you can use to check a worksheet for spelling errors. The spell checker looks for spelling errors by comparing words on the worksheet against words contained in its standard dictionary. If you often use specialized terms that are not in the standard dictionary, you may want to add them to a custom dictionary using the Spelling dialog box.

When the spell checker finds a word that is not in either dictionary, it displays the word in the Spelling dialog box. You then can correct it if it is misspelled.

To Check Spelling on the Worksheet

To illustrate how Excel responds to a misspelled word, the following steps misspell purposely the word, Employee, in cell A3 as the word, Empolyee, as shown in Figure 2–61.

1
- Click cell A3 and then type **Empolyee** to misspell the word Employee.
- Select cell A1 so that the spell checker begins checking at the selected cell.
- Click Review on the Ribbon to display the Review tab.
- Click the Spelling button (Review tab | Proofing group) to run the spell checker and display the misspelled word in the Spelling dialog box (Figure 2–61).
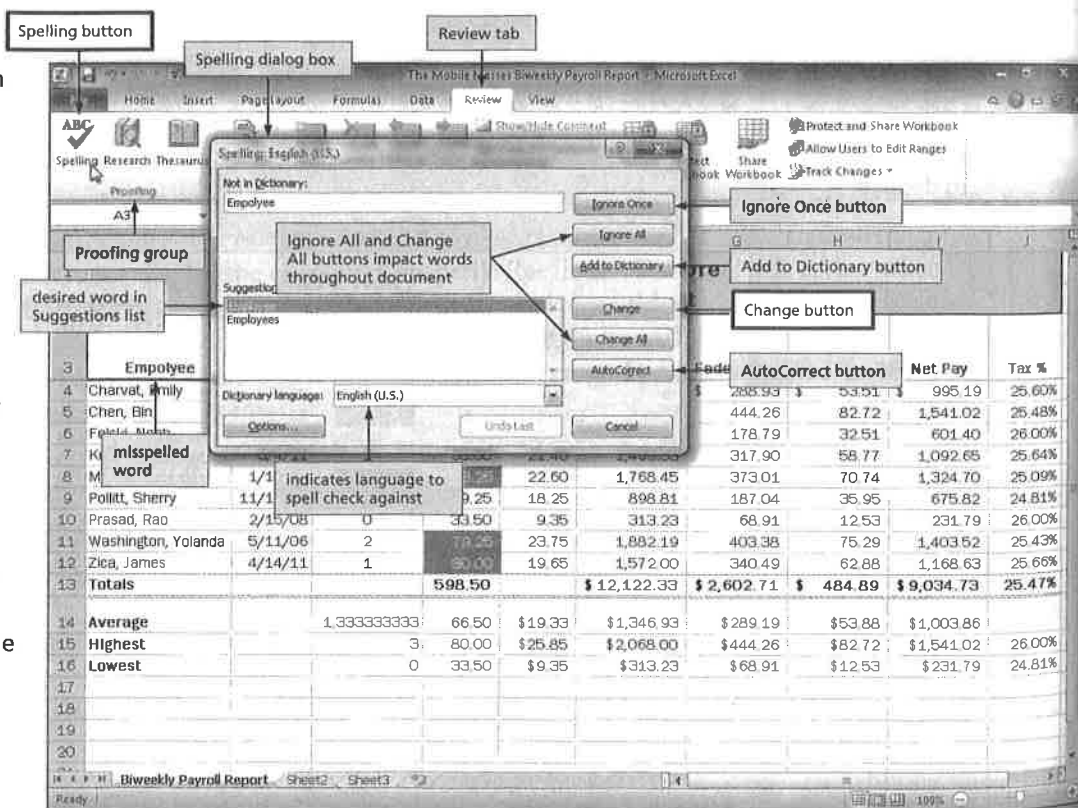
Figure 2–61

Q&A

What happens when the spell checker finds a misspelled word?

When the spell checker identifies that a cell contains a word not in its standard or custom dictionary, it selects that cell as the active cell and displays the Spelling dialog box. The Spelling dialog box lists the word not found in the dictionary and a list of suggested corrections (Figure 2–61).

②

- Click the Change button (Spelling dialog box) to change the misspelled word to the correct word (Figure 2–62).

- Click the Close button (Spelling dialog box) to close the Spelling dialog box.

- If the Microsoft Excel dialog box is displayed, click the OK button.

③

- Click anywhere in the worksheet, such as cell A18, to deselect the current cell.

- Display the Home tab.

- Click the Save button on the Quick Access Toolbar to save the workbook.
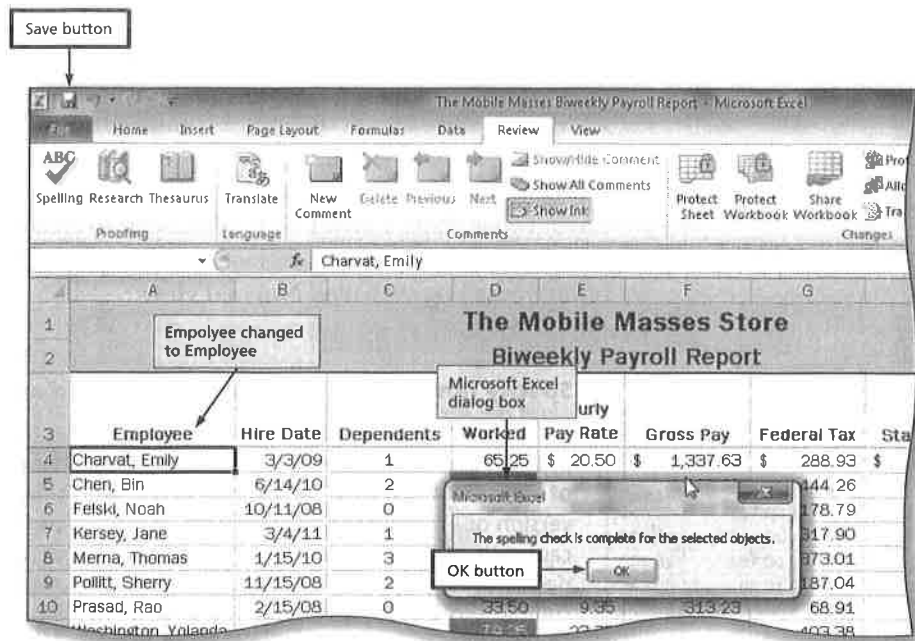
Figure 2–62

Q&A What other actions can I take in the Spelling dialog box?

If one of the words in the Suggestions list is correct, click it and then click the Change button. If none of the suggestions is correct, type the correct word in the Not in Dictionary text box and then click the Change button. To change the word throughout the worksheet, click the Change All button instead of the Change button. To skip correcting the word, click the Ignore Once button. To have Excel ignore the word for the remainder of the worksheet, click the Ignore All button.

Other Ways
1. Press F7

Additional Spell Checker Considerations

Consider these additional guidelines when using the spell checker:

- To check the spelling of the text in a single cell, double-click the cell to make the formula bar active and then click the Spelling button (Review tab | Proofing group).

- If you select a single cell so that the formula bar is not active and then start the spell checker, Excel checks the remainder of the worksheet, including notes and embedded charts.

- If you select a cell other than cell A1 before you start the spell checker, Excel will display a dialog box when the spell checker reaches the end of the worksheet, asking if you want to continue checking at the beginning.

- If you select a range of cells before starting the spell checker, Excel checks the spelling of the words only in the selected range.

- To check the spelling of all the sheets in a workbook, right-click any sheet tab, click Select All Sheets on the sheet tab shortcut menu, and then start the spell checker.

- To add words to the dictionary such as your last name, click the Add to Dictionary button in the Spelling dialog box (Figure 2–61) when Excel identifies the word as not in the dictionary.

- Click the AutoCorrect button (Spelling dialog box) to add the misspelled word and the correct version of the word to the AutoCorrect list. For example, suppose that you misspell the word, do, as the word, dox. When the spell checker displays the Spelling dialog box with the correct word, do, in the Change to box, click the AutoCorrect button. Then, anytime in the future that you type the word dox, Excel automatically will change it to the word, do.

BTW

Error Checking
Always take the time to check the formulas of a worksheet before submitting it to your supervisor. You can check formulas by clicking the Error Checking button (Formulas tab | Formula Auditing group). You also should test the formulas by employing data that tests the limits of formulas. Experienced spreadsheet specialists spend as much time testing a workbook as they do creating it, and they do so before placing the workbook into production.

Preparing to Print the Worksheet

Excel allows for a great deal of customization in how a worksheet appears when printed. For example, the margins on the page can be adjusted. A header or footer can be added to each printed page as well. Excel also has the capability to work on the worksheet in Page Layout view. **Page Layout view** allows you to create or modify a worksheet while viewing how it will look in printed format. The default view that you have worked in up until this point in the book is called **Normal view**.

Plan Ahead

Specify how the printed worksheet should appear.

Before printing a worksheet, you should consider how the worksheet will appear when printed. In order to fit as much information on the printed page as possible, the margins of the worksheet should be set to a reasonably small width and height. While the current version of a worksheet may print on one page, you may add more data in the future that causes the worksheet to extend to multiple pages. It is, therefore, a good idea to add a page header to the worksheet that prints in the top margin of each page. A **header** is common content that prints on every page of a worksheet. Landscape orientation is a good choice for large worksheets because the printed worksheet's width is greater than its length.

To Change the Worksheet's Margins, Header, and Orientation in Page Layout View

The following steps change to Page Layout view, narrow the margins of the worksheet, change the header of the worksheet, and set the orientation of the worksheet to landscape. Often, you may want to reduce margins so that the printed worksheet better fits the page. **Margins** are those portions of a printed page outside the main body of the printed document and always are blank when printed. Recall that in Excel Chapter 1, the worksheet was printed in landscape orientation. The current worksheet also is too wide for a single page and requires landscape orientation to fit on one page in a readable manner.

1
- Click the Page Layout button on the status bar to view the worksheet in Page Layout view (Figure 2–63).

Q&A What are some key features of Page Layout view?

Page Layout view shows the worksheet divided into pages. A gray background separates each page. The white areas surrounding each page indicate the print margins. The top of each page includes a Header area, and

Figure 2–63

the bottom of each page includes a Footer area. Page Layout view also includes a ruler at the top of the page that assists you in placing objects on the page, such as charts and pictures.
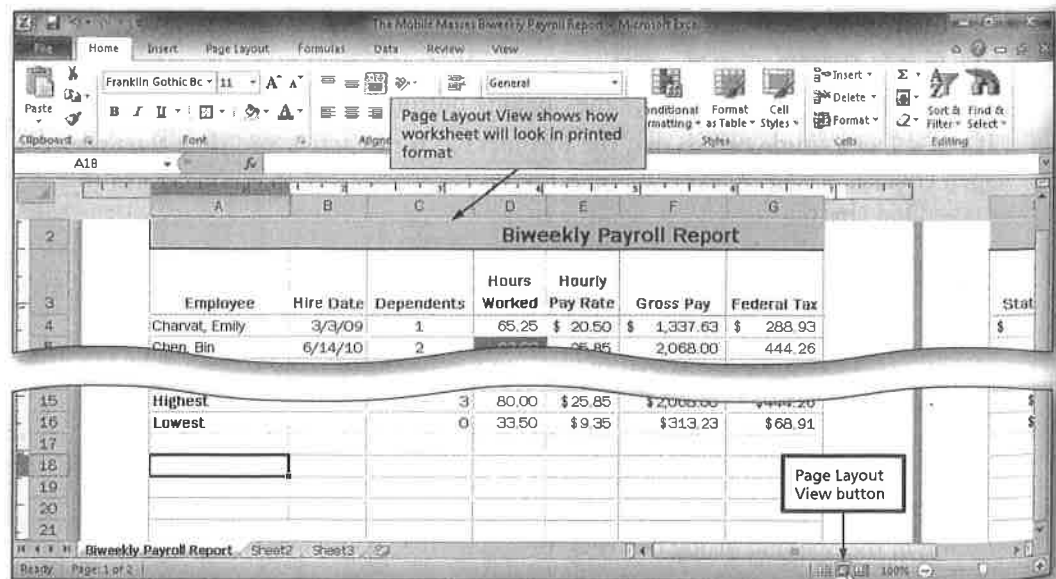
2

- Display the Page Layout tab.

- Click the Margins button (Page Layout tab | Page Setup group) to display the Margins gallery (Figure 2–64).
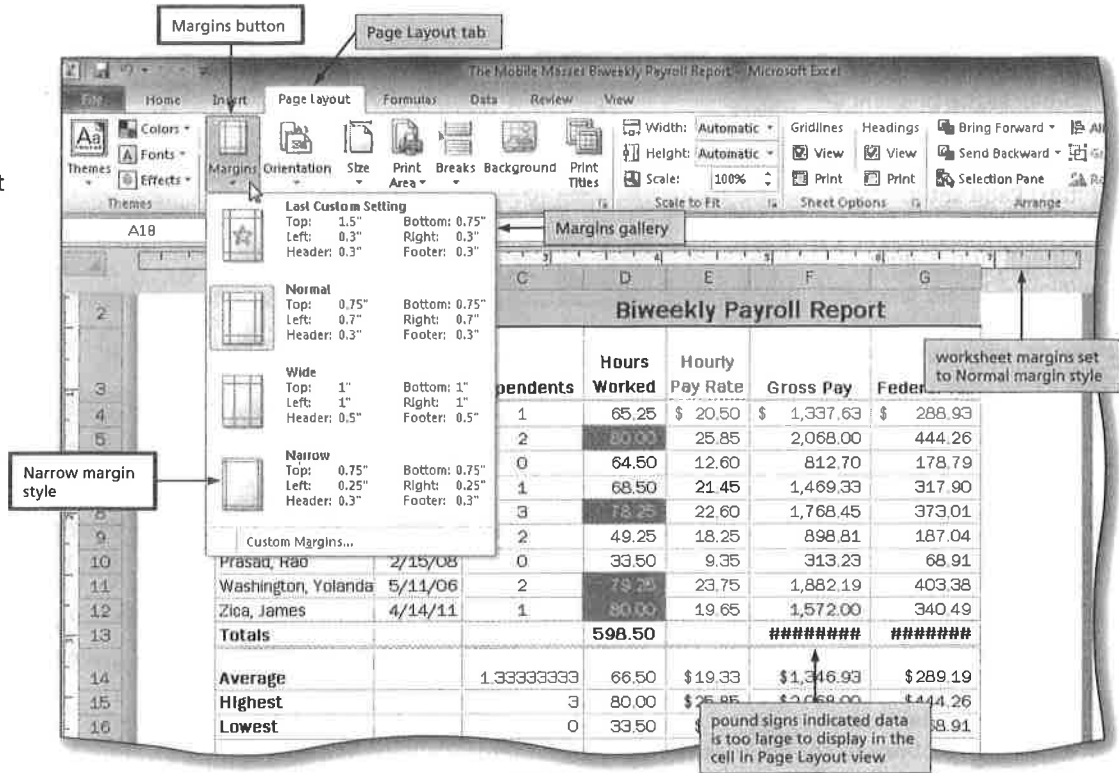
Figure 2–64

3

- Click Narrow in the Margins gallery to change the worksheet margins to the Narrow margin style.

- Drag the scroll bar on the right side of the worksheet to the top so that row 1 of the worksheet is displayed.

- Click above the worksheet title in cell A1 in the center area of the Header area.

- Type **Samuel Snyder** and then press the ENTER key. Type **Chief Financial Officer** to complete the worksheet header (Figure 2–65).

Figure 2–65

Q&A
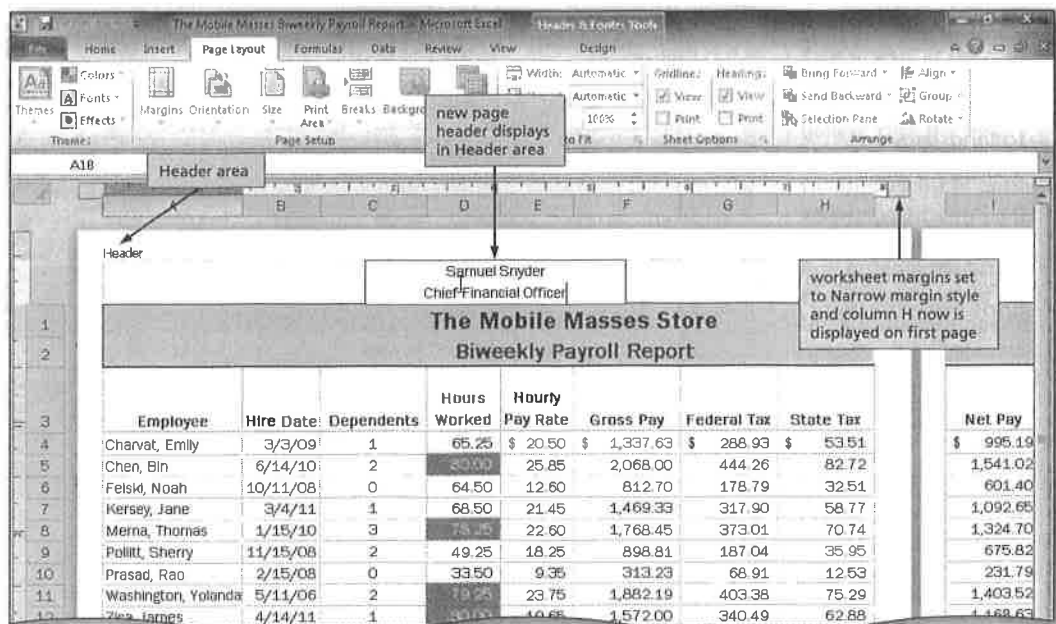
What else can I place in a header?

You can add text, page number information, date and time information, the file path of the workbook, the file name of the workbook, the sheet name of the workbook, and pictures to a header.

4

- Select cell B16 to deselect the header. Click the Orientation button (Page Layout tab | Page Setup group) to display the Orientation gallery (Figure 2–66).

Q&A Why do I need to deselect the header?

Excel disables almost all of the buttons on the Ribbon as you edit a header or footer. In addition to the commands on the Design tab (Figure 2–65 on the previous page), only a few commands remain available on the Home tab on the Ribbon. To continue working in Excel, therefore, you should select a cell in the worksheet so that all of the commands on the Ribbon are available for your use.
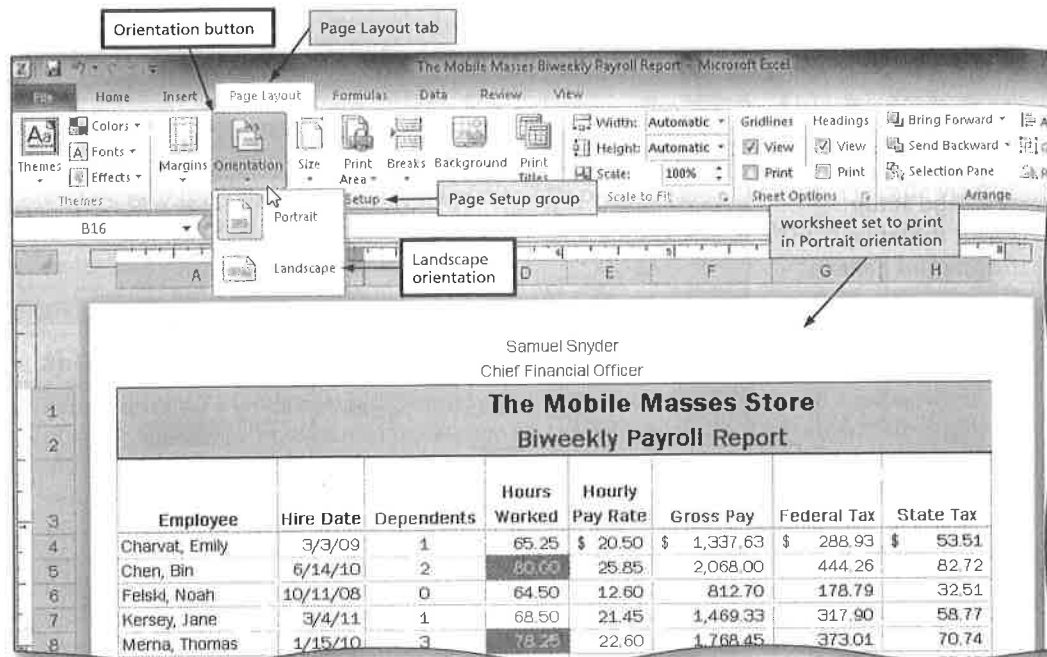
Figure 2–66

5

- Click Landscape in the Orientation gallery to change the worksheet's orientation to landscape (Figure 2–67).

Q&A Do I need to change the orientation every time I want to print the worksheet?

No. Once you change the orientation and save the workbook, Excel will save the orientation setting for that workbook until you change it. When you open a new workbook, Excel sets the orientation to portrait.
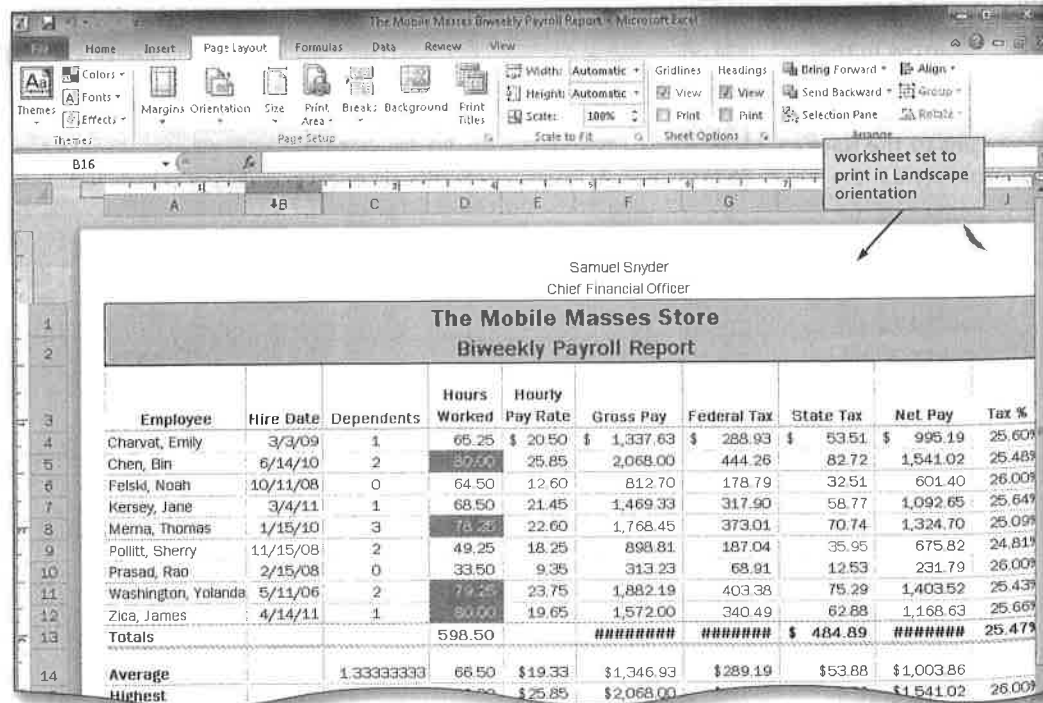
Figure 2–67

Other Ways

1. Click Page Setup Dialog Box Launcher (Page Layout tab | Page Setup group), click Page tab (Page Setup dialog box), click Portrait or Landscape, click OK button

Printing the Worksheet

Excel provides other options for printing a worksheet. The following sections print the worksheet and print a section of the worksheet.

To Print a Worksheet

The following steps print the worksheet.

1 Click File on the Ribbon to open the Backstage view.

2 Click the Print tab in the Backstage view to display the Print gallery.

3 If necessary, click the Printer Status button in the Print gallery to display a list of available Printer options and then click the desired printer to change the currently selected printer.

4 Click the Print button in the Print gallery to print the worksheet in landscape orientation on the currently selected printer.

5 When the printer stops, retrieve the hard copy (Figure 2–68).

landscape orientation

Samuel Snyder
Chief Financial Officer

The Mobile Masses Store
Biweekly Payroll Report

Employee	Hire Date	Dependents	Hours Worked	Hourly Pay Rate	Gross Pay	Federal Tax	State Tax	Net Pay	Tax %
Charvat, Emily	3/3/09	1	65.25	$ 20.50	$ 1,337.63	$ 288.93	$ 53.51	$ 995.19	25.60%
Chen, Bin	6/14/10	2	80.00	25.85	2,068.00	444.26	82.72	1,541.02	25.48%
Felski, Noah	10/11/08	0	64.50	12.60	812.70	178.79	32.51	601.40	26.00%
Kersey, Jane	3/4/11	1	68.50	21.45	1,469.33	317.90	58.77	1,092.65	25.64%
Merna, Thomas	1/15/10	3	78.25	22.60	1,768.45	373.01	70.74	1,324.70	25.09%
Pollitt, Sherry	11/15/08	2	49.25	18.25	898.81	187.04	35.95	675.82	24.81%
Prasad, Rao	2/15/08	0	33.50	9.35	313.23	68.91	12.53	231.79	26.00%
Washington, Yolanda	5/11/06	2	79.25	23.75	1,882.19	403.38	75.29	1,403.52	25.43%
Zica, James	4/14/11	1	80.00	19.65	1,572.00	340.49	62.88	1,168.63	25.66%
Totals			598.50		$ 12,122.33	$ 2,602.71	$ 484.89	$ 9,034.73	25.47%
Average		1.333333333	66.50	$19.33	$1,346.93	$289.19	$53.88	$1,003.86	
Highest		3	80.00	$25.85	$2,068.00	$444.26	$82.72	$1,541.02	26.00%
Lowest		0	33.50	$9.35	$313.23	$68.91	$12.53	$231.79	24.81%

Figure 2–68

To Print a Section of the Worksheet

You might not always want to print the entire worksheet. You can print portions of the worksheet by selecting the range of cells to print and then clicking the Selection option button in the Print what area in the Print dialog box. The following steps print the range A3:F16.

1
- Select the range to print, cells A3:F16 in this case.
- Click File on the Ribbon to open the Backstage view.
- Click the Print tab to display the Print gallery.
- Click Print Active Sheets in the Settings area (Print tab | Print gallery) to display a list of options that determine what Excel should print (Figure 2–69).
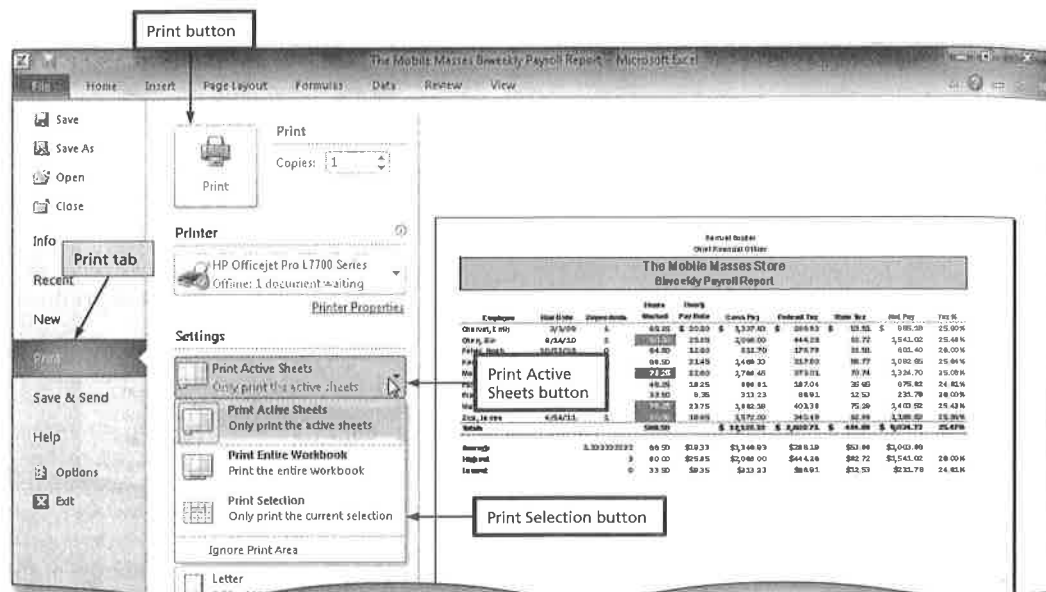
Figure 2–69

2
- Click Print Selection to instruct Excel to print only the selected range.
- Click the Print button in the Print gallery to print the selected range of the worksheet on the currently selected printer (Figure 2–70).
- Click the Normal button on the status bar to return to Normal view.
- Click cell A18 to deselect the range A3:F16.

Samuel Snyder — header prints
Chief Financial Officer

Employee	Hire Date	Dependents	Hours Worked	Hourly Pay Rate	Gross Pay
Charvat, Emily	3/3/09	1	65.25	$ 20.50	$ 1,337.63
Chen, Bin	6/14/10	2	80.00	25.85	2,068.00
Felski, Noah	10/11/08	0	64.50	12.60	812.70
Kersey, Jane	3/4/11	1	68.50	21.45	1,469.33
Merna, Thomas	1/15/10	3	78.25	22.60	1,768.45
Pollitt, Sherry	11/15/08	2	49.25	18.25	898.81
Prasad, Rao	2/15/08	0	33.50	9.35	313.23
Washington, Yolanda	5/11/06	2	79.25	23.75	1,882.19
Zica, James	4/14/11	1	80.00	19.65	1,572.00
Totals			598.50		$ 12,122.33
Average		1.333333333	66.50	$19.33	$1,346.93
Highest		3	80.00	$25.85	$2,068.00
Lowest		0	33.50	$9.35	$313.23

selected range prints

Figure 2–70

Q&A

What are my options for telling Excel what to print?

Excel includes three options to allow you to determine what should be printed (Figure 2–69). As shown in the previous steps, the Print Selection button instructs Excel to print the selected range. The Print Active Sheets button instructs Excel to print the active worksheet (the worksheet currently on the screen) or the selected worksheets. Finally, the Print Entire Workbook button instructs Excel to print all of the worksheets in the workbook.

Other Ways

1. Select range, click Print Area button (Page Layout tab | Page Setup group), click Set Print Area, click Quick Print button on Quick Access Toolbar, click Print Area, click Clear Print Area

2. Select range, click Print Area button (Page Layout tab | Page Setup group), click Set Print Area, click File tab to open Backstage view, click Print tab, click Print button

Displaying and Printing the Formulas Version of the Worksheet

Thus far, you have been working with the **values version** of the worksheet, which shows the results of the formulas you have entered, rather than the actual formulas. Excel also can display and print the **formulas version** of the worksheet, which shows the actual formulas you have entered, rather than the resulting values.

The formulas version is useful for debugging a worksheet. **Debugging** is the process of finding and correcting errors in the worksheet. Viewing and printing the formulas version instead of the values version makes it easier to see any mistakes in the formulas.

When you change from the values version to the formulas version, Excel increases the width of the columns so that the formulas and text do not overflow into adjacent cells on the right. The formulas version of the worksheet, thus, usually is significantly wider than the values version. To fit the wide printout on one page, you can use landscape orientation, which has already been selected for the workbook, and the Fit to option in the Page sheet in the Page Setup dialog box.

To Display the Formulas in the Worksheet and Fit the Printout on One Page

The following steps change the view of the worksheet from the values version to the formulas version of the worksheet and then print the formulas version on one page.

1
- Press CTRL+ACCENT MARK (`) to display the worksheet with formulas.
- Click the right horizontal scroll arrow until column J appears (Figure 2–71).

2
- Click the Page Setup Dialog Box Launcher (Page Layout tab | Page Setup group) to display the Page Setup dialog box.
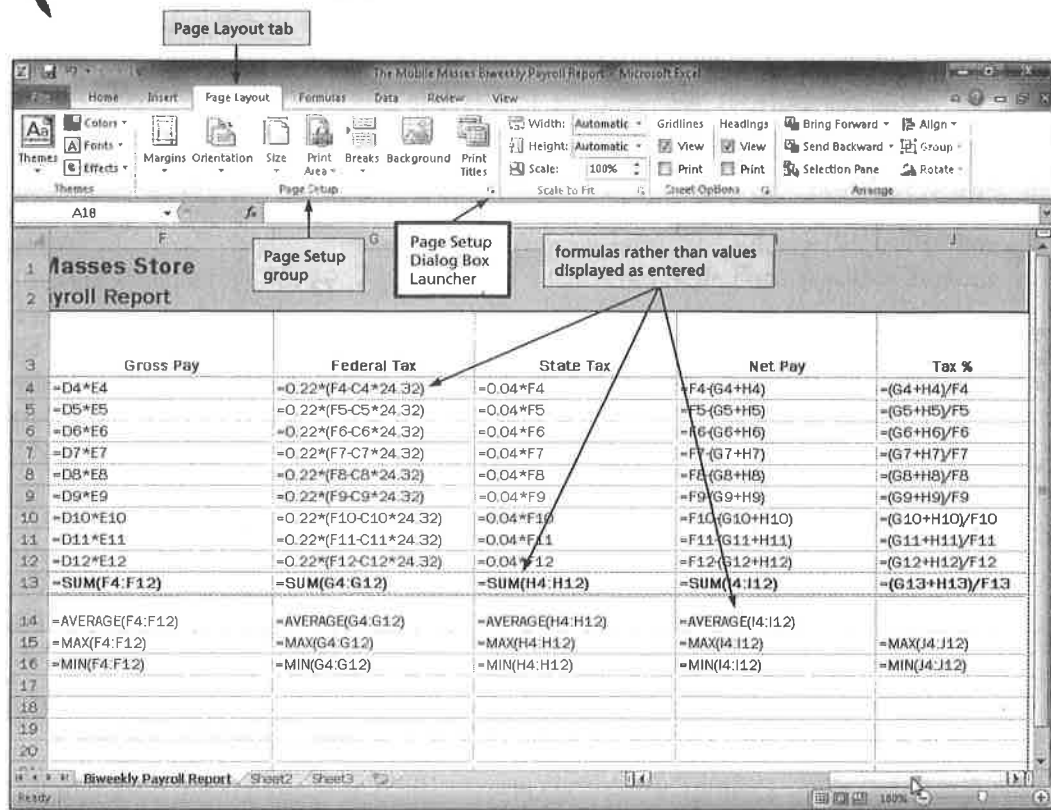
Figure 2–71

3
- If necessary, click Landscape in the Orientation area to select it.
- If necessary, click Fit to in the Scaling area to select it.

4

- Click the Print button (Page Setup dialog box) to print the formulas in the worksheet on one page in landscape orientation (Figure 2–72). If necessary, in the Backstage view, select the Print Active Sheets option in the Settings area of the Print gallery.

- When Excel displays the Backstage view, click the Print button to print the worksheet.
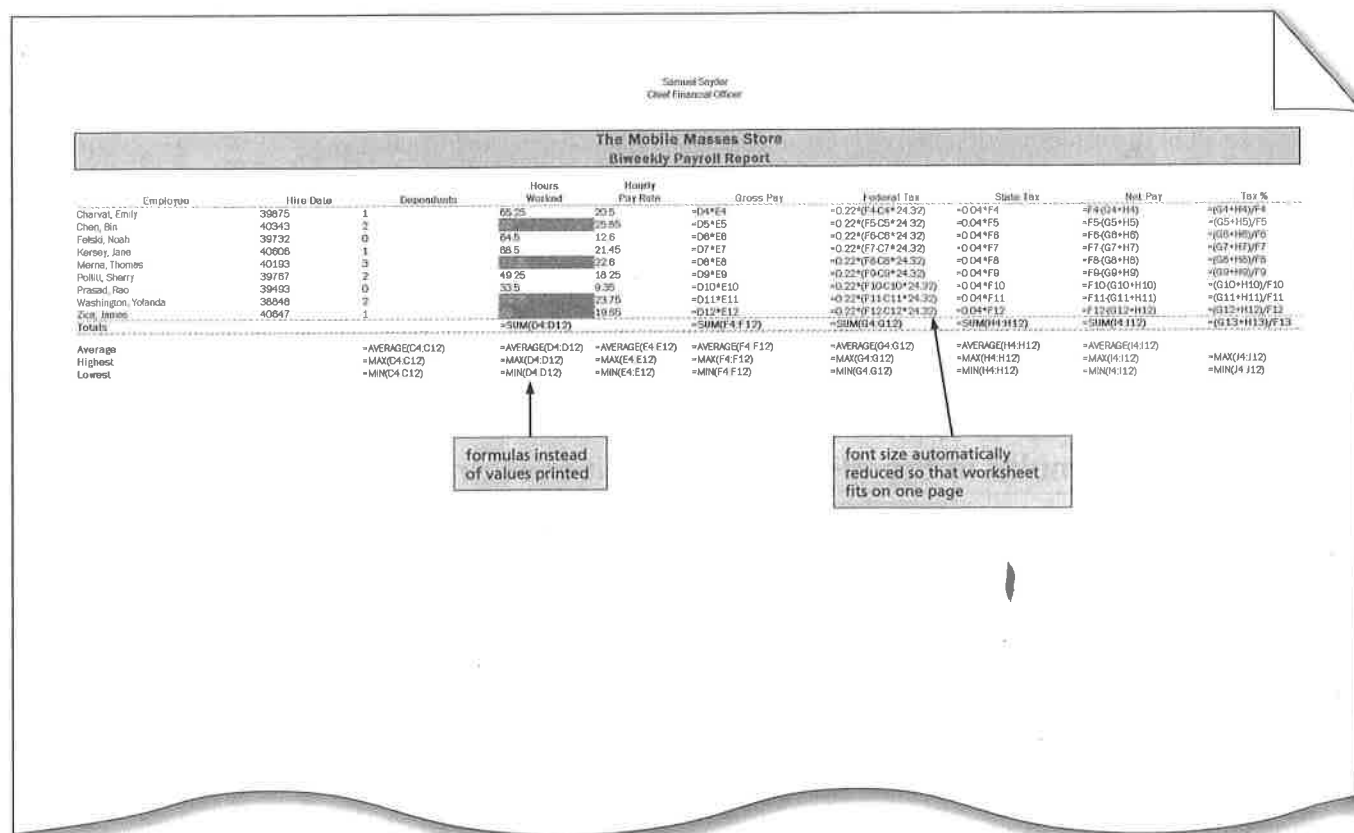
Figure 2–72

5

- After viewing and printing the formulas version, press CTRL+ACCENT MARK (`) to instruct Excel to display the values version.

- Click the left horizontal scroll arrow until column A appears.

To Change the Print Scaling Option Back to 100%

Depending on your printer, you may have to change the Print Scaling option back to 100% after using the Fit to option. Doing so will cause the worksheet to print at the default print scaling of 100%. The following steps reset the Print Scaling option so that future worksheets print at 100%, instead of being resized to print on one page.

1 If necessary, display the Page Layout tab and then click the Page Setup Dialog Box Launcher (Page Layout tab | Page Setup group) to display the Page Setup dialog box.

2 Click Adjust to in the Scaling area to select the Adjust to setting.

3 If necessary, type 100 in the Adjust to box to adjust the print scaling to a new percentage.

④ Click the OK button (Page Setup dialog box) to set the print scaling to normal.

⑤ Display the Home tab.

Q&A

What is the purpose of the Adjust to box in the Page Setup dialog box?

The Adjust to box allows you to specify the percentage of reduction or enlargement in the printout of a worksheet. The default percentage is 100%. When you click the Fit to option, this percentage automatically changes to the percentage required to fit the printout on one page.

BTW

Quick Reference
For a table that lists how to complete the tasks covered in the Office chapters in this book using the mouse, Ribbon, shortcut menu, and keyboard, see the Quick Reference Summary at the back of this book, or visit the Microsoft Office and Concepts CourseMate Web site at www.cengagebrain.com and then navigate to the Quick Reference resource for this book.

To Save the Workbook and Quit Excel

With the workbook complete, the following steps save the workbook and quit Excel.

① Click the Save button on the Quick Access Toolbar.

② Click the Close button on the upper-right corner of the title bar.

Chapter Summary

In this chapter you have learned how to enter formulas, calculate an average, find the highest and lowest numbers in a range, verify formulas using Range Finder, added borders, align text, format numbers, change column widths and row heights, and add conditional formatting to a range of numbers. In addition, you learned to spell check a worksheet, print a section of a worksheet, and display and print the formulas version of the worksheet using the Fit to option. The items listed below include all the new Excel skills you have learned in this chapter.

1. Enter a Formula Using the Keyboard (EX 75)
2. Enter Formulas Using Point Mode (EX 77)
3. Copy Formulas Using the Fill Handle (EX 80)
4. Determine the Average of a Range of Numbers Using the Keyboard and Mouse (EX 84)
5. Determine the Highest Number in a Range of Numbers Using the Insert Function Box (EX 86)
6. Determine the Lowest Number in a Range of Numbers Using the Sum Menu (EX 87)
7. Copy a Range of Cells Across Columns to an Adjacent Range Using the Fill Handle (EX 89)
8. Verify a Formula Using Range Finder (EX 91)
9. Change the Workbook Theme (EX 94)
10. Change the Background Color and Apply a Box Border to the Worksheet Title and Subtitle (EX 96)
11. Format Dates and Center Data in Cells (EX 98)
12. Apply an Accounting Number Format and Comma Style Format Using the Ribbon (EX 100)
13. Apply a Currency Style Format with a Floating Dollar Sign Using the Format Cells Dialog Box (EX 102)
14. Apply a Percent Style Format and Use the Increase Decimal Button (EX 103)
15. Apply Conditional Formatting (EX 104)
16. Change the Widths of Columns (EX 107)
17. Change the Heights of Rows (EX 110)
18. Check Spelling on the Worksheet (EX 112)
19. Change the Worksheet's Margins, Header, and Orientation in Page Layout View (EX 114)
20. Print a Section of the Worksheet (EX 118)
21. Display the Formulas in the Worksheet and Fit the Printout on One Page (EX 119)

If you have a SAM 2010 user profile, your instructor may have assigned an autogradable version of this assignment. If so, log into the SAM 2010 Web site at www.cengage.com/sam2010 to download the instruction and start files.

Learn It Online

Test your knowledge of chapter content and key terms.

Instructions: To complete the Learn It Online exercises, visit the Microsoft Office and Concepts CourseMate Web site at www.cengagebrain.com, navigate to the Excel Chapter 2 resources for this book, click the link for the exercise you want to complete, and then read the instructions.

Chapter Reinforcement TF, MC, and SA
A series of true/false, multiple choice, and short answer questions that test your knowledge of the chapter content.

Flash Cards
An interactive learning environment where you identify chapter key terms associated with displayed definitions.

Practice Test
A series of multiple choice questions that test your knowledge of chapter content and key terms.

Who Wants To Be a Computer Genius?
An interactive game that challenges your knowle of chapter content in the style of a television quiz show.

Wheel of Terms
An interactive game that challenges your knowle of chapter key terms in the style of the television show *Wheel of Fortune*.

Crossword Puzzle Challenge
A crossword puzzle that challenges your knowle of key terms presented in the chapter.

Apply Your Knowledge

Reinforce the skills and apply the concepts you learned in this chapter.

Profit Analysis Worksheet

Instructions: The purpose of this exercise is to open a partially completed workbook, enter formulas and functions, copy the formulas and functions, and then format the worksheet titles and numbers. As shown in Figure 2–73, the completed worksheet analyzes the costs associated with a police department's fleet of vehicles.

	A	B	C	D	E	F	G	H	I	J	K
1			Village of Scott Police Department								
2			Monthly Vehicle Cost-per-Mile Summary								
3	Vehicle ID	Miles Driven	Cost per Mile	Maintenance Cost	Mileage Cost	Total Cost	Total Cost per Mile				
4	670543	2,007	$ 0.49	$ 242.80	$ 983.43	$ 1,226.23	$ 0.61				
5	979253	3,192	0.48	446.37	1,532.16	1,978.53	0.62				
6	948173	3,802	0.65	472.47	2,471.30	3,943.77	0.77				
7	837625	2,080	0.62	432.25	1,289.60	1,721.85	0.83				
8	824664	2,475	0.56	369.88	1,386.00	1,755.88	0.71				
9	655385	3,294	0.50	352.05	1,647.00	1,999.05	0.61				
10	836417	3,640	0.70	417.80	2,548.00	2,965.80	0.81				
11	993617	3,395	0.70	390.39	2,376.50	2,766.89	0.81				
12	779468	4,075	0.55	442.17	2,241.25	2,683.42	0.66				
13	Totals	27,960		$ 3,566.18	$ 16,475.24	$ 20,041.42	$ 0.72				
14	Highest	4,075	$0.70	$473.47	$2,548.00	$2,965.80	$0.83				
15	Lowest	2,007	$0.48	$242.80	$983.43	$1,226.23	$0.61				
16	Average	3,107	$0.58	$396.24	$1,830.58	$2,226.82	$0.72				
17											
18											
19											
20											

Figure 2–73

1. Start Excel. Open the workbook Apply 2-1 Village of Scott Police Department. See the inside back cover of this book for instructions for downloading the Data Files for Students or see your instructor for information on accessing the files required in this book.

2. Use the following formulas in cells E4, F4, and G4:

   Mileage Cost (cell E4) = Miles Driven * Cost per Mile or = B4 * C4

   Total Cost (cell F4) = Maintenance Cost + Mileage Cost or = D4 + E4

   Total Cost per Mile (cell G4) = Total Cost / Miles Driven or = F4 / B4

   Use the fill handle to copy the three formulas in the range E4:G4 to the range E5:G12.

3. Determine totals for the miles driven, maintenance cost, mileage cost, and total cost in row 13. Copy the formula in cell G12 to G13 to assign the formula in cell G12 to G13 in the total line. If necessary, reapply the Total cell style to cell G13.

4. In the range B14:B16, determine the highest value, lowest value, and average value, respectively, for the values in the range B4:B12. Use the fill handle to copy the three functions to the range C14:G16.

5. Format the worksheet as follows:

   a. change the workbook theme to Foundry by using the Themes button (Page Layout tab | Themes group)

   b. cell A1 — change to Title cell style

   c. cell A2 — change to a font size of 16

   d. cells A1:A2 — Rose background color and a thick box border

   e. cells C4:G4 and D13:G13 — Accounting number format with two decimal places and fixed dollar signs by using the Accounting Number Format button (Home tab | Number group)

   f. cells C5:G12 — Comma style format with two decimal places by using the Comma Style button (Home tab | Number group)

   g. cells B4:B16 — Comma style format with no decimal places

   h. cells C14:G16 — Currency style format with floating dollar signs by using the Format Cells: Number Dialog Box Launcher (Home tab | Number group)

   i. cells G4:G12 — apply conditional formatting so that cells with a value greater than 0.80 appear with a rose background color

6. Switch to Page Layout View and delete any current text in the Header area. Enter your name, course, laboratory assignment number, and any other information, as specified by your instructor, in the Header area. Preview and print the worksheet in landscape orientation. Change the document properties, as specified by your instructor. Save the workbook using the file name, Apply 2-1 Village of Scott Police Department Complete.

7. Use Range Finder to verify the formula in cell G13.

Apply Your Knowledge *continued*

8. Print the range A3:D16. Press CTRL+ACCENT MARK (`) to change the display from the values version of the worksheet to the formulas version. Print the formulas version in landscape orientation on one page (Figure 2–74) by using the Fit to option in the Page sheet in the Page Setup dialog box. Press CTRL+ACCENT MARK (`) to change the display of the worksheet back to the values version. Close the workbook without saving it.

9. Submit the workbook and results as specified by your instructor.

Jeff Quasney
Apply 2-1 Village of Scott Police Department

Village of Scott Police Department
Monthly Vehicle Cost-per-Mile Summary

Vehicle ID	Miles Driven	Cost per Mile	Maintenance Cost	Mileage Cost	Total Cost	Total Cost per Mile
670543	2007	0.49	242.8	=B4*C4	=D4+E4	=F4/B4
979283	3192	0.48	448.37	=B5*C5	=D5+E5	=F5/B5
948173	3802	0.66	472.47	=B6*C6	=D6+E6	=F6/B6
837626	2080	0.62	432.28	=B7*C7	=D7+E7	=F7/B7
824664	2475	0.96	369.88	=B8*C8	=D8+E8	=F8/B8
695385	3294	0.6	352.05	=B9*C9	=D9+E9	=F9/B9
836417	3640	0.7	417.8	=B10*C10	=D10+E10	=F10/B10
993617	3395	0.7	390.39	=B11*C11	=D11+E11	=F11/B11
779468	4075	0.95	442.17	=B12*C12	=D12+E12	=F12/B12
Totals	=SUM(B4:B12)		=SUM(D4:D12)	=SUM(E4:E12)	=SUM(F4:F12)	=F13/B13
Highest	=MAX(B4:B12)	=MAX(C4:C12)	=MAX(D4:D12)	=MAX(E4:E12)	=MAX(F4:F12)	=MAX(G4:G12)
Lowest	=MIN(B4:B12)	=MIN(C4:C12)	=MIN(D4:D12)	=MIN(E4:E12)	=MIN(F4:F12)	=MIN(G4:G12)
Average	=AVERAGE(B4:B12)	=AVERAGE(C4:C12)	=AVERAGE(D4:D12)	=AVERAGE(E4:E12)	=AVERAGE(F4:F12)	=AVERAGE(G4:G12)

Figure 2–74

Extend Your Knowledge

Extend the skills you learned in this chapter and experiment with new skills. You may need to use Help to complete the assignment.

Applying Conditional Formatting to Cells

Instructions: Start Excel. Open the workbook Extend 2-1 State Wildlife Department Employee Ratings. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required in this book. Perform the following tasks to apply three types of conditional formatting to cells in a worksheet:

1. Select the range C4:C18. Click the Conditional Formatting button (Home tab | Styles group) and then click New Rule in the Conditional Formatting list. Select 'Format only top or bottom ranked values' in the Select a Rule Type area (Conditional Formatting Rules Manager dialog box), as shown in Figure 2–75. Enter any value between 10 and 25 in the text box in the Edit the Rule Description (New Formatting Rule dialog box) area, and click the '% of the selected range' check box to select it. Click the Format button, and choose a blue background to assign this conditional format. Click the OK button in each dialog box and view the worksheet.

2. With range C4:C18 selected, apply a conditional format to the range that uses a green background color to highlight cells with scores that are below average.

3. With range D4:D18 selected, apply a conditional format to the range that uses an orange background to highlight cells that contain Exemplary or Exceeds Requirements.

4. With range B4:B18 selected, apply a conditional format to the range that uses a red background color to highlight cells with duplicate student names.

5. Change the document properties as specified by your instructor. Save the workbook using the file name, Extend 2-1 State Wildlife Department Employee Ratings Complete. Submit the revised workbook as specified by your instructor.

New Formatting Rule

Select a Rule Type:
- ▶ Format all cells based on their values
- ▶ Format only cells that contain
- ▶ Format only top or bottom ranked values
- ▶ Format only values that are above or below average
- ▶ Format only unique or duplicate values
- ▶ Use a formula to determine which cells to format

Edit the Rule Description:

Format values that rank in the:

| Top | ▼ | 10 | ☑ % of the selected range |

Preview: AaBbCcYyZz   Format...

OK   Cancel

Figure 2–75

Make It Right

Analyze a workbook and correct all errors and/or improve the design.

Correcting Formatting, Functions, and Formulas in a Worksheet

Instructions: Start Excel. Open the workbook Make It Right 2-1 Dion Designwear Profit Analysis. See the inside back cover of this book for instructions for downloading the Data Files for Students, or see your instructor for information on accessing the files required for this book.

In this exercise you will learn how to correct formatting, functions, and formula problems in a worksheet (Figure 2–76).

Dion Designwear
Profit Anaylsis

	Product	Desciption	Cost	Profit	Units Sold	Total Sales	Total Profit	% Profit
4	4835	Coat	$247.63	$144.83	95,159	$37,346,101.14	$13,781,877.97	36.903%
5	7563	Custom	210.08	142.18	75,762	26,687,922.12	10,771,841.16	40.362%
6	8191	Dress	186.53	99.48	69,297	19,819,634.97	6,893,665.56	34.782%
7	8409	Hat	146.82	59.97	39,164	8,098,723.56	2,348,665.08	29.000%
8	5677	Jacket	140.68	85.63	38,261	8,658,846.91	3,276,289.43	37.837%
9	8985	Shirt	68.38	8.15	42,420	3,246,402.60	345,723.00	10.649%
10	5871	Slacks	144.54	30.44	68,536	11,992,429.28	2,086,235.84	17.396%
11	7796	Sleepwear	93.74	11.80	77,413	8,170,168.02	913,473.40	11.181%
12	7777	Suit	305.91	126.00	19,999	8,637,768.09	2,519,874.00	29.173%
13	8178	Sweater	112.21	9.24	61,257	7,439,662.65	566,014.68	7.608%
14	Totals				587,268	$140,097,659.34	$43,503,660.12	31.052%
15	Lowest		$68.38	$8.15	19,999	$3,246,402.60	$345,723.00	7.608%
16	Highest		$305.91	$144.83	95,159	$37,346,101.14	$13,781,877.97	40.362%
17	Average		$156.54	$71.77	54,679	$14,009,765.93	$3,302,420.24	25.489%

Figure 2–76

Make It Right *continued*

Perform the following tasks:

1. Add a thick box border around the title and subtitle so that they appear more separated from the rest of the worksheet.

2. Adjust the width of column D to 8.11 pixels so that the word in the column header does not wrap. Adjust the column widths of columns F and G to best fit.

3. Spell check the worksheet and correct any spelling mistakes that are found, but ignore any spelling mistakes found with the worksheet title and the product descriptions.

4. Center the values in the Product column.

5. The averages in several columns do not include the product in row 4. Adjust the functions in these cells so that all products are included in the calculation.

6. The total sales calculations should be:

   Total Sales = Units Sold * (Cost + Profit)

   Adjust the formulas in the range F4:F13 so that the correct formula is used.

7. The value for the lowest value in column E was entered as a number rather than as a function. Replace the value with the appropriate function.

8. The currency values in rows 4 and 14 should be formatted with the Accounting Number Format button (Home tab | Number group). They are currently formatted with the Currency format (floating dollar sign). The Accounting number format displays a fixed dollar sign.

9. Delete the function in the cell containing the average of % Profit because it is mathematically invalid.

10. Change the document properties as specified by your instructor. Save the workbook using the file name, Make It Right 2–1 Dion Designwear Profit Analysis Corrected. Submit the revised workbook as specified by your instructor.

SAM In the Lab

Design and/or create a workbook using the guidelines, concepts, and skills presented in this chapter. Labs 1, 2, and 3 are listed in order of increasing difficulty.

Lab 1: Accounts Receivable Balance Worksheet

Problem: You are a part-time assistant in the accounting department at Aficionado Guitar Parts, a Chicago-based supplier of custom guitar parts. You have been asked to use Excel to generate a report that summarizes the monthly accounts receivable balance (Figure 2–77). A chart of the balances also is desired. The customer data in Table 2–6 is available for test purposes.

Table 2–6 Aficionado Guitar Parts Accounts Receivable Data				
Customer	**Beginning Balance**	**Credits**	**Payments**	**Purchases**
Cervantes, Katriel	803.01	56.92	277.02	207.94
Cummings, Trenton	285.05	87.41	182.11	218.22
Danielsson, Oliver	411.45	79.33	180.09	364.02
Kalinowski, Jadwiga	438.37	60.90	331.10	190.39
Lanctot, Royce	378.81	48.55	126.15	211.38
Raglow, Dora	710.99	55.62	231.37	274.71
Tuan, Lin	318.86	85.01	129.67	332.89

Instructions Part 1: Create a worksheet similar to the one shown in Figure 2–77. Include the five columns of customer data in Table 2–6 in the report, plus two additional columns to compute a service charge and a new balance for each customer. Assume no negative unpaid monthly balances.

Customer	Beginning Balance	Credits	Payments	Purchases	Service Charge	New Balance
Aficionado Guitar Parts						
Monthy Accounts Receivable Balance Report						
Cervantes, Katriel	$803.01	$56.92	$277.02	$207.94	$15.24	$692.25
Cummings, Trenton	285.05	87.41	182.11	218.22	0.50	234.25
Danielsson, Oliver	411.45	79.33	180.09	364.02	4.94	520.99
Kalinowski, Jadwiga	438.37	60.90	331.10	190.39	1.51	238.27
Lanctot, Royce	378.81	48.55	126.15	211.38	6.63	422.12
Raglow, Dora	710.99	55.62	231.37	274.71	13.78	712.49
Tuan, Lin	318.86	85.01	129.67	332.89	3.39	440.46
Totals	**$3,346.54**	**$473.74**	**$1,457.51**	**$1,799.55**	**$46.00**	**$3,260.84**
Highest	$803.01	$87.41	$331.10	$364.02	$15.24	$712.49
Lowest	$285.05	$48.55	$126.15	$190.39	$0.50	$234.25
Average	$478.08	$67.68	$208.22	$257.08	$6.57	$465.83

Figure 2–77

Perform the following tasks:

1. Enter and format the worksheet title **Aficionado Guitar Parts** and worksheet subtitle **Monthly Accounts Receivable Balance Report** in cells A1 and A2. Change the theme of the worksheet to the Trek theme. Apply the Title cell style to cells A1 and A2. Change the font size in cell A1 to 28 points. Merge and center the worksheet title and subtitle across columns A through G. Change the background color of cells A1 and A2 to the Red standard color. Change the font color of cells A1 and A2 to the White theme color. Draw a thick box border around the range A1:A2.

2. Change the width of column A to 20.00 points. Change the widths of columns B through G to 12.00 points. Change the heights of row 3 to 36.00 points and row 12 to 30.00 points.

3. Enter the column titles in row 3 and row titles in the range A11:A14, as shown in Figure 2–77. Center the column titles in the range A3:G3. Apply the Heading 3 cell style to the range A3:G3. Apply the Total cell style to the range A11:G11. Bold the titles in the range A12:A14. Change the font size in the range A3:G14 to 12 points.

4. Enter the data in Table 2–6 in the range A4:E10.

5. Use the following formulas to determine the service charge in column F and the new balance in column G for the first customer. Copy the two formulas down through the remaining customers.

   a. Service Charge (cell F4) = 3.25% * (Beginning Balance – Payments – Credits)

   b. New Balance (G4) = Beginning Balance + Purchases – Credits – Payments + Service Charge

6. Determine the totals in row 11.

7. Determine the maximum, minimum, and average values in cells B12:B14 for the range B4:B10, and then copy the range B12:B14 to C12:G14.

In the Lab *continued*

8. Format the numbers as follows: (a) assign the Currency style with a floating dollar sign to the cells containing numeric data in the ranges B4:G4 and B11:G14, and (b) assign a number style with two decimal places and a thousand's separator (currency with no dollar sign) to the range B5:G10.

9. Use conditional formatting to change the formatting to white font on a red background in any cell in the range F4:F10 that contains a value greater than 10.

10. Change the worksheet name from Sheet1 to Accounts Receivable and the sheet tab color to the Red standard color. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information as specified by your instructor.

11. Spell check the worksheet. Preview and then print the worksheet in landscape orientation. Save the workbook using the file name, Lab 2-1 Part 1 Aficionado Guitar Parts Accounts Receivable Balance Report.

12. Print the range A3:D14. Print the formulas version on another page. Close the workbook without saving the changes. Submit the assignment as specified by your instructor.

Instructions Part 2:   In this part of the exercise, you will create a 3-D Bar chart on a new worksheet in the workbook (Figure 2–78). If necessary, use Excel Help to obtain information on inserting a chart on a separate sheet in the workbook.
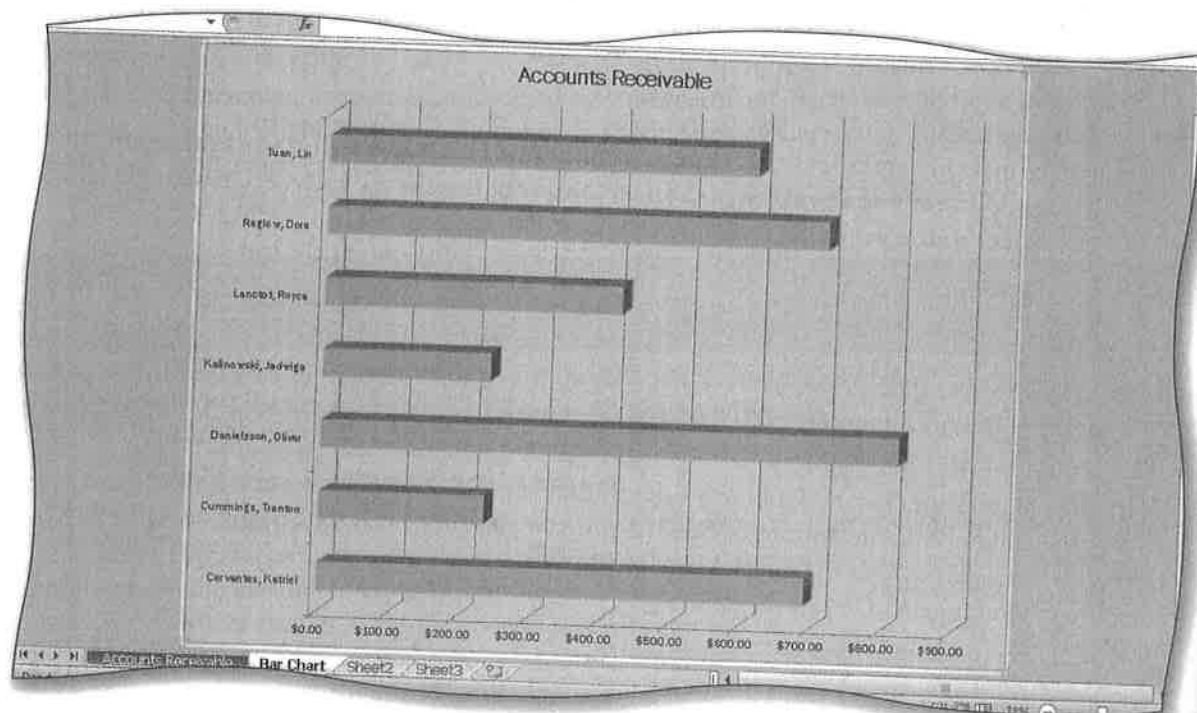
Figure 2–78

1. Open the workbook Lab 2-1 Part 1 Aficionado Guitar Parts Accounts Receivable Balance Report workbook created in Part 1. Save the workbook using the file name, Lab 2-1 Part 2 Aficionado Guitar Parts Accounts Receivable Balance Report.

2. Use the CTRL key and mouse to select the nonadjacent chart ranges A4:A10 and G4:G10. That is, select the range A4:A10 and while holding down the CTRL key, select the range G4:G10.

3. Click the Bar button (Insert tab | Charts group) and then select Clustered Bar in 3-D in the 3-D Bar area. When the chart is displayed on the worksheet, click the Move Chart button (Chart Tools Design tab | Location group). When the Move Chart dialog box appears, click New sheet and then type Bar Chart for the sheet name. Click the OK button (Move Chart dialog box). Change the sheet tab color to the Green standard color.

4. When the chart is displayed on the new worksheet, click the Series 1 series label and then press the DELETE key to delete it. Click the chart area, which is a blank area near the edge of the chart, click the Shape Fill button (Chart Tools Format tab | Shape Styles group), and then select Orange, Accent 1, Lighter 60% in the gallery (column 5, row 3). Click one of the bars in the chart. Click the Shape Fill button (Chart Tools Format tab | Shape Styles group) and then select the Green standard color. Click the Chart Title button (Chart Tools Layout tab | Labels group) and then select Above Chart in the Chart Title gallery. If necessary, use the scroll bar on the right side of the worksheet to scroll to the top of the chart. Click the edge of the chart title to select it and then type `Accounts Receivable` as the chart title.

5. Drag the Accounts Receivable tab at the bottom of the worksheet to the left of the Bar Chart tab to reorder the sheets in the workbook. Preview and print the chart.

6. Click the Accounts Receivable sheet tab. Change the following beginning balances: customer Oliver Danielsson to $702.13 and customer Lin Tuan to $482.74. The company also decided to change the service charge from 3.25% to 2.75% for all customers. After copying the adjusted formula in cell F4 to the range F5:F10, click the Auto Fill Options button and then click Fill without Formatting to maintain the original formatting in the range F5:F10. The total new balance in cell G11 should equal $3,720.82.

7. Select both sheets by holding down the SHIFT key and then clicking the Bar Chart tab. Preview and print the selected sheets. Save the workbook. Submit the assignment as specified by your instructor.

In the Lab

Lab 2: Sales Summary Worksheet

Problem: You have been asked to build a worksheet for a start-up company, Electry Auto, that analyzes the financing needs for the company's first six months in business. The company plans to begin operations in January with an initial investment of $500,000.00. The expected revenue and costs for the company's first six months are shown in Table 2–7. The desired worksheet is shown in Figure 2–79 on the following page. The initial investment is shown at the starting balance for January (cell B4). The amount of financing required by the company is shown as the lowest ending balance (cell F12).

Table 2–7 Electry Auto Start-Up Financing Needs Data		
Month	Revenue	Costs
January	105000	220000
February	82000	260000
March	200000	255000
April	250000	320000
May	325000	420000
June	510000	540000

In the Lab *continued*

Instructions Part 1: Perform the following tasks to build the worksheet shown in Figure 2–79.

	A	B	C	D	E	F
1			**Electry Auto**			
2			**Start-Up Financing Needs**			
3	**Month**	**Starting Balance**	**Revenue**	**Costs**	**Net Income**	**Ending Balance**
4	January	$ 500,000.00	$ 105,000.00	$ 220,000.00	$ (115,000.00)	$ 385,000.00
5	February	385,000.00	82,000.00	260,000.00	(178,000.00)	207,000.00
6	March	207,000.00	200,000.00	255,000.00	(55,000.00)	152,000.00
7	April	152,000.00	250,000.00	320,000.00	(70,000.00)	82,000.00
8	May	82,000.00	325,000.00	420,000.00	(95,000.00)	(13,000.00)
9	June	(13,000.00)	510,000.00	540,000.00	(30,000.00)	(43,000.00)
10	Average	$218,833.33	$245,333.33	$335,833.33	($90,500.00)	$128,333.33
11	Highest	$500,000.00	$510,000.00	$540,000.00	($30,000.00)	$385,000.00
12	Lowest	($13,000.00)	$82,000.00	$220,000.00	($178,000.00)	($43,000.00)
13						
14						
15						
16						
17						
18						

Figure 2–79

1. Start Excel. Apply the Concourse theme to a new workbook.

2. Increase the width of column A to 10.00 and the width of columns B through F to 14.00.

3. Enter the worksheet title **Electry Auto** in cell A1 and the worksheet subtitle **Start-Up Financing Needs** in cell A2. Enter the column titles in row 3, as shown in Figure 2–79. In row 3, use ALT+ENTER to start a new line in a cell.

4. Enter the start-up financing needs data described in Table 2–7 in columns A, C, and D in rows 4 through 9. Enter the initial starting balance (cell B4) of 500000.00. Enter the row titles in the range A10:A12, as shown in Figure 2–79.

5. For the months of February through March, the starting balance is equal to the previous month's ending balance. Obtain the starting balance for February by setting the starting balance of February to the ending balance of January. Use a cell reference rather than typing in the data. Copy the formula for February to the remaining months.

6. Obtain the net income amounts in column E by subtracting the costs in column D from the revenues in column C. Enter the formula in cell E4 and copy it to the range E5:E9. Obtain the ending balance amounts in column F by adding the starting balance in column B to the net income in column F. Enter the formula in cell F4 and copy it to the range F5:F9.

7. In the range B10:B12, use the AVERAGE, MAX, and MIN functions to determine the average value, highest value, and lowest value in the range B4:B9. Copy the range B10:B12 to the range C10:F12.

8. One at a time, merge and center the worksheet title and subtitle across columns A through F. Select cells A1 and A2 and change the background color to light blue (column 7 in the Standard Colors area in the Fill Color gallery). Apply the Title cell style to cells A1 and A2. Change the worksheet title in cell A1 to 28-point white (column 1, row 1 on the Font Color gallery). Change the worksheet subtitle to the same color. Assign a thick box border to the range A1:A2.

9. Center the titles in row 3, columns A through F. Apply the Heading 3 cell style to the range A3:F3. Use the Italic button (Home tab | Font group) to italicize the column titles in row 3 and the row titles in the range A10:A12.

10. Assign a thick box border to the range A10:F12. Change the background and font color for cell F12 to the same colors applied to the worksheet title in Step 8.

11. Change the row heights of row 3 to 36.00 points and row 10 to 30.00 points.

12. Assign the Accounting number format to the range B4:F4. Assign the Comma style format to the range B5:F9. Assign a Currency format with a floating dollar sign to the range B10:F12.

13. Rename the sheet tab as Start-Up Financing Needs. Apply the Light Blue color to the sheet tab. Change the document properties, as specified by your instructor. Change the worksheet header with your name, course number, and other information as specified by your instructor. Save the workbook using the file name Lab 2-1 Part 1 Electry Auto Start-Up Financing Needs. Print the entire worksheet in landscape orientation. Next, print only the range A3:B9.

14. Display the formulas version by pressing CTRL+ACCENT MARK (`). Print the formulas version using the Fit to option button in the Scaling area on the Page tab in the Page Setup dialog box. After printing the worksheet, reset the Scaling option by selecting the Adjust to option button on the Page tab in the Page Setup dialog box and changing the percent value to 100%. Change the display from the formulas version to the values version by pressing CTRL+ACCENT MARK (`). Do not save the workbook.

15. Submit the revised workbook as requested by your instructor.

Instructions Part 2: In this part of the exercise, you will change the revenue amounts until the lowest ending balance is greater than zero, indicating that the company does not require financing in its first six months of operation. Open the workbook created in Part 1 and save the workbook as Lab 2-1 Part 2 Electry Auto Start-Up Financing Needs. Manually increment each of the six values in the revenue column by $1,000.00 until the lowest ending balance in cell F12 is greater than zero. The value of cell F12 should equal $5,000.00 All six values in column C must be incremented the same number of times. Update the worksheet header and save the workbook. Print the worksheet. Submit the assignment as specified by your instructor.

Instructions Part 3: In this part of the exercise, you will change the monthly costs until the lowest ending balance is greater than zero, indicating that the company does not require financing in its first six months of operation. Open the workbook created in Part 1 and then save the workbook as Lab 2-1 Part 3 Electry Auto Start-Up Financing Needs. Manually decrement each of the six values in the costs column by $1,000.00 until the lowest ending balance in cell F12 is greater than zero. Decrement all six values in column C the same number of times. Your worksheet is correct when the lowest ending balance in cell F12 is $5,000.00. Update the worksheet header and save the workbook. Print the worksheet. Submit the assignment as specified by your instructor.

In the Lab

Lab 3: Stock Club Investment Analysis

Problem: Several years ago, you and a large group of friends started a stock club. Each year every member invests more money per month. You have decided to create a portfolio worksheet (Figure 2–80) that summarizes the club's current stock holdings so that you can share the information with your group of friends. The club's portfolio is summarized in Table 2–8. Table 2–8 also shows the general layout of the worksheet to be created.

	A	B	C	D	E	F	G	H	I	J
						Sock-It-Away Stock Club				
1										
2						Summary of Investments				
3	Company	Stock Symbol	Purchase Date	Shares	Initial Price per Share	Initial Cost	Current Price per Share	Current Value	Gain/Loss	Percent Gain/Loss
4	Apple	AAPL	3/3/2007	250	$ 86.17	$ 21,542.50	$ 75.32	$ 18,830.00	$ (2,712.50)	-12.59%
5	Caterpillar	CAT	6/14/2008	200	81.74	16,348.00	69.02	13,804.00	(2,544.00)	-15.56%
6	Disney	DIS	10/11/2006	300	31.06	9,318.00	37.38	11,214.00	1,896.00	20.35%
7	General Electric	GE	3/4/2009	500	7.24	3,620.00	9.39	4,695.00	1,075.00	29.70%
8	MetLife	MET	1/15/2008	200	60.92	12,184.00	77.09	15,418.00	3,234.00	26.54%
9	Microsoft	MSFT	11/15/2006	500	29.20	14,600.00	36.30	18,150.00	3,550.00	24.32%
10	PepsiCo	PEP	2/15/2006	350	57.86	20,251.00	70.65	24,727.50	4,476.50	22.11%
11	Target	TGT	5/11/2004	450	44.11	19,849.50	44.02	19,809.00	(40.50)	-0.20%
12	Wal-Mart	WMT	4/14/2009	250	50.81	12,702.50	57.20	14,300.00	1,597.50	12.58%
13	Totals					$ 130,415.50		$ 140,947.50	$ 10,532.00	8.08%
14	Average			333.3333	$49.90	$14,490.61	$52.93	$15,660.83	$1,170.22	
15	Highest			500	$86.17	$21,542.50	$77.09	$24,727.50	$4,476.50	29.70%
16	Lowest			200	$7.24	$3,620.00	$9.39	$4,695.00	($2,712.50)	-15.56%
17										
18										
19										

Figure 2–80

Table 2–8 Sock-It-Away Stock Club

Company	Stock Symbol	Purchase Date	Shares	Initial Price per Share	Initial Cost	Current Price per Share	Current Value	Gain/ Loss	Percent Gain/ Loss
Apple	AAPL	3/3/2007	250	86.17	Formula A	75.32	Formula B	Formula C	Formula D
Caterpillar	CAT	6/14/2008	200	81.74		69.02			
Disney	DIS	10/11/2006	300	31.06		37.38			
General Electric	GE	3/4/2009	500	7.24		9.39			
MetLife	MET	1/15/2008	200	60.92		77.09			
Microsoft	MSFT	11/15/2006	500	29.20		36.30			
PepsiCo	PEP	2/15/2006	350	57.86		70.65			
Target	TGT	5/11/2004	450	44.11		44.02			
Wal-Mart	WMT	4/14/2009	250	50.81		57.20			
Totals				Formula E					
Average				Formula F					
Highest				Formula G					
Lowest				Formula H					

Instructions: Perform the following tasks:

1. Start Excel. Enter the worksheet titles Sock-It-Away Stock Club in cell A1 and Summary of Investments in cell A2.

2. Enter the column titles and data in Table 2–8 beginning in row 3.

3. Change the column widths and row heights as follows: column A — 11.78; column C — 10.00; columns E and G — 7.44; columns F, H, and I — 13.00; column J — 8.22; row 3 — 56.25 points; row 14 — 27.00 points.

4. Enter the following formulas in row 4 and then copy them down through row 12:

   a. Enter Formula A in cell F4: Initial Cost = Shares × Initial Price per Share

   b. Enter Formula B in cell H4: Current Value = Shares × Current Price Per Share

   c. Enter Formula C in cell I4: Gain/Loss = Current Value – Initial Cost

   d. Enter Formula D in cell J4: Percent Gain/Loss = Gain/Loss / Initial Cost

5. Compute the totals for initial cost, current value, gain/loss, and percent gain loss. For the percent gain/loss in cell J13, copy cell J12 to J13 using the fill handle.

6. In cells D14, D15, and D16, enter Formulas E, F, and G using the AVERAGE, MAX, and MIN functions. Copy the three functions across through the range J14:J16. Delete the invalid formula in cell J14.

7. Format the worksheet as follows:

   a. Apply the Trek theme to the worksheet.

   b. Format the worksheet title with Title cell style. Merge and center across columns A through J.

   c. Format the worksheet subtitle with Franklin Gothic Book font, 16 point font size, Black, Text 1 theme font color. Merge and Center across columns A through J.

   d. Format the worksheet title and subtitle background with Orange, Accent 1, Lighter 60% theme color and a thick box border.

   e. Format row 3 with the Heading 3 cell style and row 13 with the Total cell style.

   f. Format the data in rows 4 through 12: center data in column B; format dates in column C to the mm/dd/yy date format; range E4:I4 — Accounting number format style with fixed dollar sign; range E5:I12 — Comma style; range J4:J13 — Percent style with two decimal places; cells F13, H13, and I13 — Accounting Number format with fixed dollar sign.

   g. Format E14:I16 — Currency format with floating decimal places; J15:J16 — Percent style with two decimal places.

   h. Format J4:J12 — apply conditional formatting so that if a cell in range is less than 0, then cell appears with a pink background color.

8. Spell check the worksheet. Change the name of the sheet tab to Summary of Investments and apply the Orange, Accent 1, Darker 25% theme color to the sheet tab. Update the document properties, and save the workbook using the file name, Lab 2-3 Sock-It-Away Stock Club Summary of Investments. Print the worksheet in landscape orientation. Print the formulas version on one page. Close the workbook without saving changes. Submit the assignment as specified by your instructor.

Cases and Places

Apply your creative thinking and problem-solving skills to design and implement a solution.

1: Analyzing Emergency Student Loans

Academic

The Student Assistance office at your school provides emergency loans at simple interest. The data obtained from six types of loans and the desired report format are shown in Table 2–9. The required formulas are shown in Table 2–10. Use the concepts and techniques presented in this chapter to create and format the worksheet. Include total, average, maximum, and minimum values for Principal, Interest, and Amount Due.

Table 2–9 Emergency Student Loan Data and Worksheet Layout

Loan Type	Principal	Rate	Time in Years
Academic Supplies	$40,000	7.5%	.4
Medical Emergency	$25,500	12%	.33
Personal Emergency	$12,750	8.25%	.5
Room and Board	$27,000	6.5%	1
Travel Expenses	$4,550	12%	.5
Tuition Reimbursement	$107,000	6%	1

Table 2–10 Emergency Student Loan Formulas

Interest = Principal × Rate × Time

Amount Due = Principal + Interest

Average = AVERAGE function

Minimum = MIN function

Maximum = MAX function

2: Analyzing Energy Consumption

Personal

Your parents believe that your late night studying sessions and household appliance usage contribute to excessive electricity bills. You have decided to try to prove them wrong by analyzing your daily and monthly electricity consumption. You research the energy consumption of your personal items and appliance usage to obtain consumption costs per hour for each item. Table 2–11 contains the data and format for the report you want to create.

Use the concepts and techniques presented in this project to create and format the worksheet. Include an embedded 3-D Pie chart that shows the cost per month. Use Microsoft Excel Help to create a professional looking 3-D Pie chart with title and data labels.

Table 2–11 Appliance Electricity Usage Costs

Appliance	Cost per Hour	Hours Used Daily	Total Cost Per Day	Total Cost per Month (30 Days)
Clothes dryer	$0.325	1		
Computer	$0.02	6		
DVD player	$0.035	1		
Light bulbs	$0.043	8		
Refrigerator	$0.035	24		
Stereo	$0.02	5		
Television	$0.04	4		
Washing machine	$0.03	2		

3: Analyzing Profit Potential

Professional

You work for HumiCorp, an online retailer of home humidifiers. Your manager wants to know the profit potential of their inventory based on the items in inventory listed in Table 2–12. Table 2–12 contains the format of the desired report. The required formulas are shown in Table 2–13. Use the concepts and techniques developed in this chapter to create and format the worksheet. The company just received 67 additional desk-sized humidifiers and shipped out 48 room-sized humidifiers. Update the appropriate cells to reflect the change in inventory.

Table 2–12 HumiCorp Inventory Profit Potential Data and Worksheet Layout

Item	Units on Hand	Unit Cost	Total Cost	Unit Price	Total Value	Potential Profit
Desk	187	27.58	Formula A	Formula B	Formula C	Formula D
Filtered home-sized	42	324.14				
Filtered room-sized	118	86.55				
Home-sized	103	253.91				
Room-sized	97	53.69				
Total	—	—	—	—	—	—
Average	Formula E					
Lowest	Formula F					
Highest	Formula G					

Table 2–13 HumiCorp Inventory Profit Potential Formulas

Formula A = Units on Hand × Unit Cost
Formula B = Unit Cost × (1 / (1 − .66))
Formula C = Units on Hand × Unit Price
Formula D = Total Value − Total Cost
Formula E = AVERAGE function
Formula F = MIN function
Formula G = MAX function