EXCEL

INTRODUCTION TO EXCEL

What Is a Spreadsheet?

CASE STUDY | OK Office Systems

You are an assistant manager at OK Office Systems (OKOS) in Toronto. OKOS sells a wide range of computer systems, peripherals, and furniture for small- and medium-sized organizations in the metropolitan area. To compete against large, global big-box office supply stores, OKOS provides competitive pricing by ordering directly from local manufacturers rather than dealing with distributors.

The manager asked you to help prepare a markup, discount, and profit analysis for selected items on sale. The manager has been keeping these data in a ledger, but you will develop a spreadsheet to perform the necessary calculations. Although your experience with Microsoft Office Excel 2010 may be limited, you are excited to apply your knowledge and skills to your newly assigned responsibility.

When you get to the Hands-On Exercises, you will create and format the analytical spreadsheet to practise the skills you learn in this chapter.

OBJECTIVES

AFTER YOU READ THIS CHAPTER, YOU WILL BE ABLE TO:

1. Plan for effective workbook and worksheet design
2. Explore the Excel window
3. Enter and edit cell data
4. Use symbols and the order of precedence
5. Use Auto Fill
6. Display cell formulas
7. Manage worksheets
8. Manage columns and rows
9. Select, move, copy, and paste
10. Apply alignment and font options
11. Apply number formats
12. Select page setup options
13. Print a worksheet

Introduction to Spreadsheets

The ability to organize, calculate, and evaluate quantitative data is one of the most important skills needed today for personal, as well as managerial, decision making. In your personal life, you track expenses for your household budget, maintain a savings plan, and determine what amount you can afford for a house or car payment. Retail managers create and analyze their organizations' annual budgets, sales projections, and inventory records. Charitable organizations track the donations they receive, the distribution of those donations, and overhead expenditures. Scientists track the results of their experiments and perform statistical analysis to draw conclusions and recommendations.

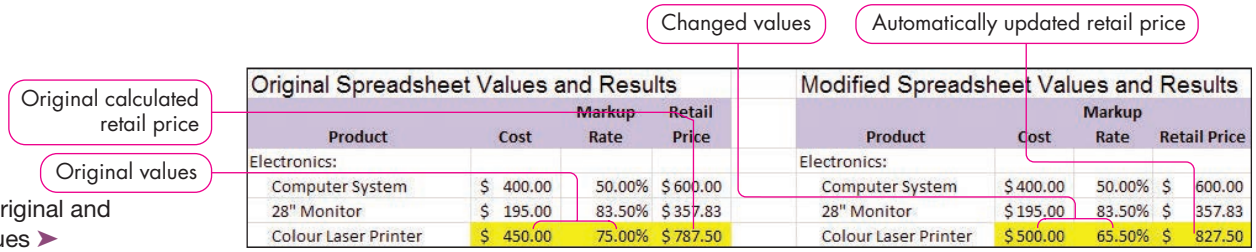
The ability to organize, calculate, and evaluate quantitative data is one of the most important skills needed today.

Regardless of what type of quantitative analysis you need to do, you can use a spreadsheet to help you maintain data and perform calculations. A ***spreadsheet*** is an electronic file that contains a grid of columns and rows used to organize related data and to display results of calculations, enabling interpretation of quantitative data for decision making. A ***spreadsheet program*** is a computer application, such as Microsoft Excel, that you use to create and modify electronic spreadsheets.

A **spreadsheet** is an electronic file that contains a grid of columns and rows containing related data.

A **spreadsheet program** is a computer application used to create and modify spreadsheets.

Performing calculations using a calculator and then entering the results into a ledger can lead to inaccurate values. If an input value is incorrect or needs to be updated, you have to recalculate the results manually, which is time-consuming and can lead to inaccuracies. An electronic spreadsheet makes data-entry changes easy. If the formulas are correctly constructed, the results recalculate automatically and accurately, saving time and reducing room for error. The left side of Figure 1 shows the original spreadsheet with the $450 cost, 75% markup rate, and calculated retail price. The right side shows the updated spreadsheet with a $500 cost, 65.5% markup, and automatically updated retail price.



Original Spreadsheet Values and Results

Product	Cost	Markup Rate	Retail Price
Electronics:			
Computer System	$ 400.00	50.00%	$ 600.00
28" Monitor	$ 195.00	83.50%	$ 357.83
Colour Laser Printer	$ 450.00	75.00%	$ 787.50

Modified Spreadsheet Values and Results

Product	Cost	Markup Rate	Retail Price
Electronics:			
Computer System	$ 400.00	50.00%	$ 600.00
28" Monitor	$ 195.00	83.50%	$ 357.83
Colour Laser Printer	$ 500.00	65.50%	$ 827.50

FIGURE 1 Original and Modified Values ➤

In this section, you will learn how to design workbooks and worksheets. In addition, you will explore the Excel window and learn the name of each window element. Then, you will enter text, values, dates, and formulas in a worksheet.

Planning for Effective Workbook and Worksheet Design

Microsoft Excel is the most popular spreadsheet program used today. In Excel, a ***worksheet*** is a single spreadsheet that typically contains descriptive labels, numeric values, formulas, functions, and graphical representations of data. A ***workbook*** is a collection of one or more related worksheets contained within a single file. By default, new workbooks contain three worksheets. Storing multiple worksheets within one workbook helps organize related data together in one file and enables you to perform calculations among the worksheets within the workbook. For example, you can create a budget workbook of 13 worksheets, one for each month to store your personal income and expenses and a final worksheet to calculate totals across the entire year.

A **worksheet** is a spreadsheet that contains formulas, functions, values, text, and visual aids.

A **workbook** is a file containing related worksheets.

You should plan the structure before you start entering data into a worksheet. Using the OKOS case study as an example, the steps to design the workbook and a worksheet include the following:

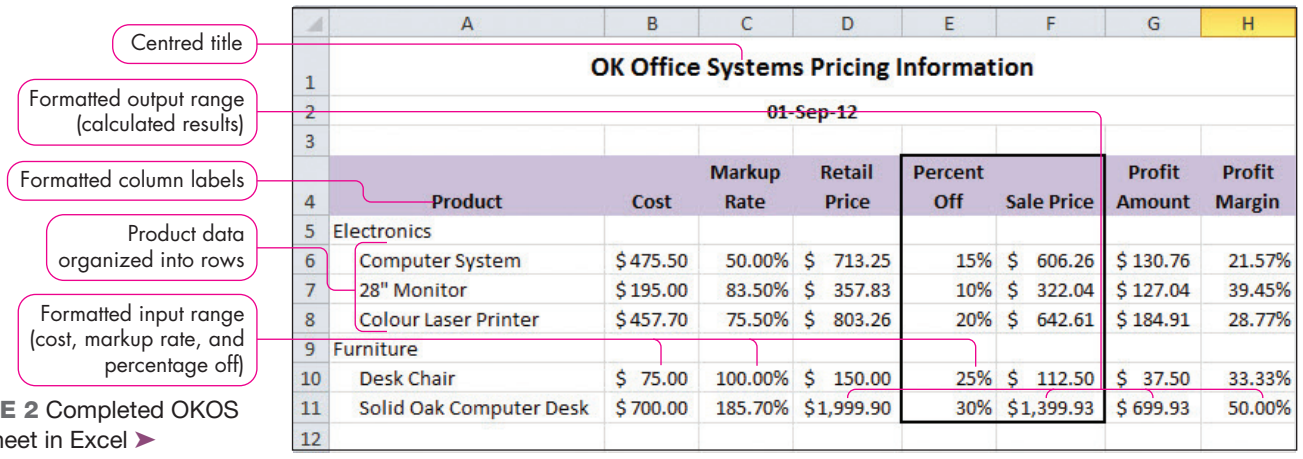
1. **State the purpose of the worksheet.** The purpose of the OKOS worksheet is to provide data, including a profit margin, on selected products on sale.

An **input area** is a range of cells containing values for variables used in formulas.

An **output area** is a range of cells containing results based on manipulating the variables.

2. **Decide what input values are needed.** Create an ***input area***, a range of cells to enter values for your variables or assumptions. Clearly label an input area so that users know where to change values. For the OKOS worksheet, list the product names, the costs OKOS pays the manufacturers, the markup rates, and the proposed discount rates for the sale. Enter these data in individual cells to enable changes if needed.
3. **Decide what outputs are needed to achieve the purpose of the worksheet.** Create an ***output area***, a range of cells that contains the results of manipulating values in the input area. As the OKOS assistant manager, you need to calculate the retail price (i.e., the selling price to your customers), the sale price, and the profit margin. As you plan your formulas, avoid constants (raw numbers); instead, use references to cells containing numbers.
4. **Assign the worksheet inputs and results into columns and rows, and consider labelling.** Typically, descriptive labels appear in the first column to represent each row of data. For the OKOS worksheet, enter the product names in the first column. Labels at the top of each column represent individual columns of data, such as cost, markup rate, and selling price.
5. **Enter the labels, values, and formulas in Excel.** Change the input values to test that your formulas produce correct results. If necessary, correct any errors in the formulas to produce correct results regardless of the input values. For the OKOS worksheet, change some of the original costs and markup rates to ensure the calculated retail price, selling price, and profit margin percentage results update correctly.
6. **Format the numerical values in the worksheet.** Align decimal points in columns of numbers. In the OKOS worksheet, use Accounting Number Format and the Percent Style to format the numerical data. Adjust the number of decimal places as needed.
7. **Format the descriptive titles and labels attractively but so as not to distract your audience from the purpose of the worksheet.** Include a descriptive title and label for each column. Add bold to headings, increase the font size for readability, and use colour to draw attention to important values or trends. In the OKOS worksheet, you will centre the main title over all the columns and apply a larger font size to it.
8. **Document the worksheet as thoroughly as possible.** Include the current date, your name as the author of the worksheet, assumptions, and purpose of the worksheet.
9. **Save the completed workbook.** Preview and prepare printouts for distribution in meetings, or send an electronic copy of the workbook to those who need it.

Figure 2 shows the completed worksheet in Excel.



	A	B	C	D	E	F	G	H
1	OK Office Systems Pricing Information							
2	01-Sep-12							
3								
4	Product	Cost	Markup Rate	Retail Price	Percent Off	Sale Price	Profit Amount	Profit Margin
5	Electronics							
6	Computer System	$ 475.50	50.00%	$ 713.25	15%	$ 606.26	$ 130.76	21.57%
7	28" Monitor	$ 195.00	83.50%	$ 357.83	10%	$ 322.04	$ 127.04	39.45%
8	Colour Laser Printer	$ 457.70	75.50%	$ 803.26	20%	$ 642.61	$ 184.91	28.77%
9	Furniture							
10	Desk Chair	$ 75.00	100.00%	$ 150.00	25%	$ 112.50	$ 37.50	33.33%
11	Solid Oak Computer Desk	$ 700.00	185.70%	$ 1,999.90	30%	$ 1,399.93	$ 699.93	50.00%
12								

FIGURE 2 Completed OKOS Worksheet in Excel ➤

Exploring the Excel Window

By now, you should be familiar with the standard interface of Microsoft Office applications: the Quick Access Toolbar, title bar, control buttons, Ribbon, Home tab, the Backstage view, and scroll bars. The Excel window includes screen elements that are similar to other Office applications and items that are unique to Excel. Figure 3 identifies elements specific to the Excel window, and Table 1 lists and describes the Excel window elements.

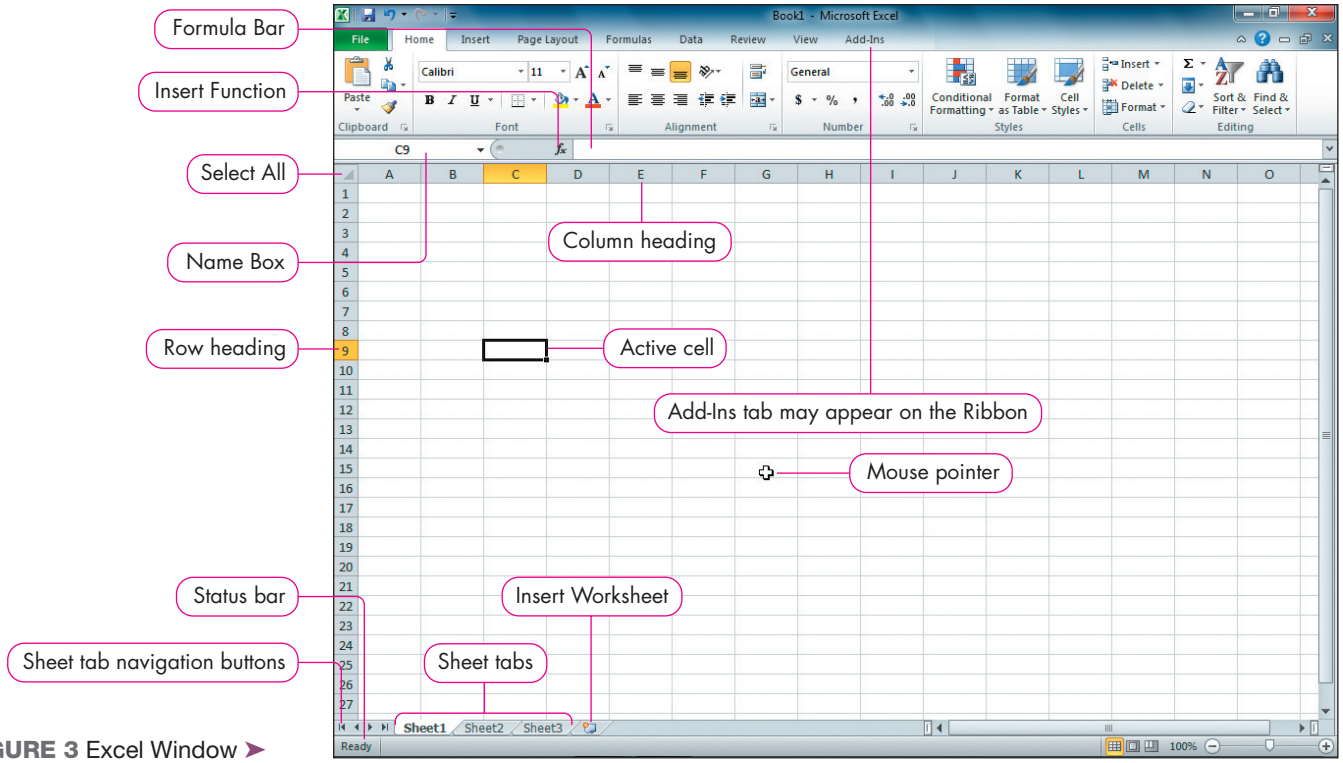


FIGURE 3 Excel Window ➤

TIP Add-Ins Tab

You may see an Add-Ins tab on the Ribbon. This tab indicates that additional functionality, such as an updated Office feature or an Office-compatible program, has been added to your system. Add-Ins are designed to increase your productivity.

TABLE 1 Excel Elements

Element	Description
Name Box	The ***Name Box*** is an identifier that displays the address of the cell currently used in the worksheet. You can use the Name Box to go to a cell, assign a name to one or more cells, or select a function.
Cancel	Cancel appears to the right of the Name Box when you enter or edit data. Click Cancel to cancel the data entry or edit and revert back to the previous data in the cell, if any. Cancel disappears after you click it.
Enter	Enter appears to the right of the Name Box when you enter or edit data. Click Enter to accept data typed in the active cell and keep the current cell active. The Enter check mark disappears after you enter the data.
Insert Function	Click to display the Insert Function dialog box, which enables you to search for and select a function to insert into the active cell.
Formula Bar	The ***Formula Bar***, the area that appears below the Ribbon and to the right of Insert Function, shows the contents of the active cell. You can enter or edit cell contents here or directly in the active cell. Drag the bottom border of the Formula Bar down to increase the space of the Formula Bar in order to display large amounts of data or a long formula contained in the active cell.
Select All	The square at the intersection of the row and column headings in the top-left corner of the worksheet. Click it to select everything contained in the active worksheet.

The **Name Box** identifies the address of the current cell.

The **Formula Bar** displays the content (text, value, date, or formula) in the active cell.

TABLE 1 (*Continued*)	
Element	**Description**
Column headings	The letters above the columns, such as A, B, C, and so on.
Row headings	The numbers to the left of the rows are row headings, such as 1, 2, 3, and so on.
Sheet tabs	***Sheet tabs***, located at the bottom-left corner of the Excel window, show the names of the worksheets contained in the workbook. Three sheet tabs, initially named Sheet1, Sheet2, and Sheet3, are included when you start a new Excel workbook. You can rename sheets with more meaningful names. To display the contents of a particular worksheet, click its sheet tab.
Sheet Tab Navigation buttons	If your workbook contains several worksheets, Excel may not show all the sheet tabs at the same time. Use the buttons to display the first, previous, next, or last worksheet.
Status bar	Located at the bottom of the Excel window, below the sheet tabs and above the Windows taskbar, the status bar displays information about a selected command or operation in progress. For example, it displays *Select destination and press ENTER or choose Paste* after you use the Copy command.

A **sheet tab** displays the name of a worksheet within a workbook.

Identify Columns, Rows, and Cells

A worksheet contains columns and rows, with each column and row assigned a heading. Columns are assigned alphabetic headings from columns A to Z, continuing from AA to AZ, and then from BA to BZ until XFD, which is the last of the possible 16,384 columns. Rows have numeric headings ranging from 1 to 1,048,576 (the maximum number of rows available).

A **cell** is the intersection of a column and row.

A **cell address** identifies a cell by a column letter and a row number.

The intersection of a column and row is a ***cell***; a total of over 17 billion cells are available in a worksheet. Each cell has a unique ***cell address***, identified first by its column letter and then its row number. For example, the cell at the intersection of column A and row 9 is cell A9. Cell references are useful when referencing data in formulas, or in navigation.

Navigate In and Among Worksheets

The **active cell** is the current cell, indicated by a dark border.

The ***active cell*** is the current cell. Excel displays a dark border around the active cell in the worksheet window, and the cell address of the active cell appears in the Name Box. The contents of the active cell, or the formula used to calculate the results of the active cell, appear in the Formula Bar. You can change the active cell by using the mouse to click in a different cell. If you work in a large worksheet, you may not be able to see the entire contents in one screen; use the vertical and horizontal scroll bars to display another area of the worksheet, and then click in the desired cell to make it the active cell.

To navigate to a new cell, click it, or use the arrow keys on the keyboard. When you press Enter, the next cell down in the same column becomes the active cell. Table 2 lists the keyboard methods for navigating within a worksheet. The Go To command is helpful for navigating to a cell that is not visible onscreen.

TABLE 2 Keystrokes and Actions	
Keystroke	**Used to**
↑	Move up one cell in the same column.
↓	Move down one cell in the same column.
←	Move left one cell in the same row.
→	Move right one cell in the same row.
Tab	Move right one cell in the same row.

(*Continued*)

TABLE 2 (*Continued*)	
Keystroke	**Used to**
Page Up	Move the active cell up one screen.
Page Down	Move the active cell down one screen.
Home	Move the active cell to column A of current row.
Ctrl+Home	Make cell A1 the active cell.
Ctrl+End	Make the rightmost, lowermost active corner of the worksheet—the intersection of the last column and row that contains data—the active cell. Does not move to cell XFD1048576 unless that cell contains data.
F5 or Ctrl+G	Display the Go To dialog box to enter any cell address.

To display the contents of another worksheet within the workbook, click the sheet tab at the bottom of the workbook window. The active sheet tab has a white background colour. After you click a sheet tab, you can then navigate within that worksheet.

Entering and Editing Cell Data

The four types of data that you can enter in a cell in an Excel worksheet are text; values; dates; and formulas, including functions. Figure 4 shows examples of text, values, dates, and formula results.

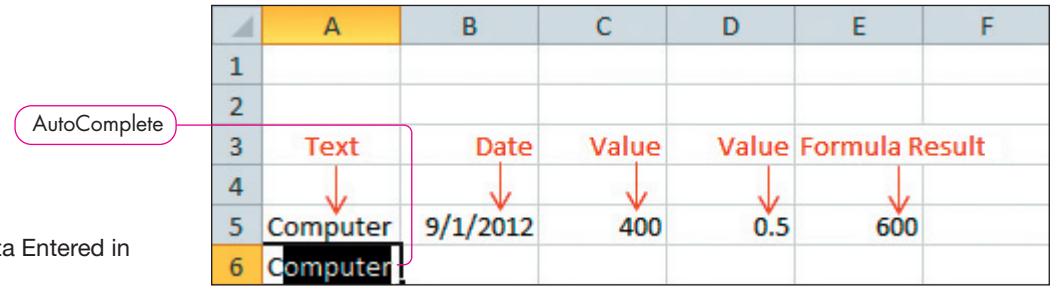


FIGURE 4 Data Entered in Cells ➤

Enter Text

Text includes letters, numbers, symbols, and spaces.

Text is any combination of letters, numbers, symbols, and spaces not used in calculations. Excel treats phone numbers, such as 555-1234, and Social Insurance Numbers, such as 123-456-789, as text entries. You enter text for a worksheet title to describe the contents of the worksheet, as row and column labels to describe data, and as cell data. Text aligns at the left cell margin by default. To enter text in a cell, do the following:

- Make sure the cell is active where you want to enter text.
- Enter the text.
- Press Enter, press an arrow key on the keyboard, or click Enter—the check mark between the Name Box and the Formula Bar. If you want to enter data without making another cell the active cell, click Enter instead of pressing Enter.

TIP Line Break in a Cell

If you have a long text label that does not fit well in a cell, you can insert a line break to display the text label on multiple lines within the cell. To insert a line break while you are typing a label, press Alt+Enter where you want to start the next line of text within the cell.

TIP AutoComplete

As soon as you begin typing a label into a cell, Excel searches for and automatically displays any other label in that column that matches the letters you typed (see Figure 4). Press Enter to accept the repeated label, or continue typing to enter a different label.

Enter Values

A **value** is a number that represents a quantity or an amount.

Values are numbers that represent a quantity or a measurable amount. Excel usually distinguishes between text and value data based on what you enter. The primary difference between text and value entries is that value entries can be the basis of calculations, whereas text cannot. Values align at the right cell margin by default. After entering values, you can align decimal places and add identifying characters, such as $ or %.

Enter Dates

You can enter dates and times in a variety of formats in cells, such as 9/15/2012; 9/15/12; September 15, 2012; or 15-Sep-12. You can also enter times, such as 1:30 PM or 13:30. You should enter a static date to document when you create or modify a workbook or to document the specific point in time when the data were accurate, such as on a balance sheet or income statement. Dates are values, so they align at the right cell margin.

Excel displays dates differently from the way it stores dates. For example, the displayed date 9/15/2012 represents the fifteenth day in September in the year 2012. Excel stores dates as serial numbers starting at 1 with January 1, 1900, so 9/15/2012 is stored as 41167 so that you can create formulas to calculate how many days exist between two dates.

TIP Static Dates and Times

Press Ctrl+semicolon to insert the current date, such as 3/28/2012, or press Ctrl+Shift+semicolon to insert the current time, such as 4:35 PM.

Enter Formulas

A **formula** is a combination of cell references, operators, values, and/or functions used to perform a calculation.

Formulas are the combination of cell references, arithmetic operations, values, and/or functions used in a calculation. For Excel to recognize a formula, you must start the formula with an equal sign (=). Because Excel requires that formulas start with =, it treats phone numbers, such as (416) 555-1234, as text, not values. In Figure 4, cell E5 contains the formula =C5*D5+C5. The result of the formula (600) displays in the cell.

Edit and Clear Cell Contents

You can edit a cell's contents by doing one of the following:

- Click the cell, click in the Formula Bar, make the changes, and then click Enter on the left side of the Formula Bar.
- Double-click the cell, make changes in the cell, and then press Enter.
- Click the cell, press F2, make changes in the cell, and then press Enter.

You can clear a cell's contents by doing one of the following:

- Click the cell, and then press Delete.
- Click the cell, click Clear in the Editing group on the Home tab, and then select Clear Contents.

1 Introduction to Spreadsheets

As the assistant manager of OKOS, you need to create a worksheet that shows the cost (the amount OKOS pays its suppliers), the markup percentage (the amount by which the cost is increased), and the retail selling price. In addition, you need to list the discount percentage (such as 25% off) for each product, the sale price, and the profit margin percentage. Most of the cells in the worksheet will contain formulas. You have already planned the design as indicated in the steps listed earlier in this chapter.

Skills covered: Enter Text • Enter Unformatted Values • Enter a Date and Clear Cell Contents

STEP 1 ENTER TEXT

Now that you have planned your worksheet, you are ready to enter labels for the title, row labels, and column labels. Refer to Figure 5 as you complete Step 1.

	A	B	C	D	E	F	G	H
1	OK Office Systems Pricing Information							
2	1-Sep-12							
3								
4	Product	Cost	Markup Ra	Retail Pric	Percent O	Sale Price	Profit Margin	
5	Computer System							
6	Color Laser Printer							
7	Filing Cabinet							
8	Desk Chair							
9	Solid Oak Computer Desk							
10	28" Monitor							
11								
12								

FIGURE 5 Text Entries ➤

FYI

a. Start Excel. Save the new workbook as **e01h1markup_LastnameFirstname**.

When you save files, use your last and first names. For example, as the Excel author, I would save my workbook as e01h1markup_MulberyKeith.

b. Type **OK Office Systems Pricing Information** in **cell A1**, and then press **Enter**.

When you press Enter, the next cell down—cell A2 in this case—becomes the active cell. The text does not completely fit in cell A1, and some of the text appears in cells B1, C1, and D1. If you make cell B1, C1, or D1 the active cell, the Formula Bar is empty, indicating that nothing is stored in those cells. If you were to type data in cell B1, that text would appear in cell B1, and although the contents of cell A1 would appear cut off, cell A1 still would contain the entire text.

c. Click **cell A4**, type **Product**, and then press **Enter**.

d. Continue typing the rest of the text in **cells A5** through **A10** as shown in Figure 5. Note that text appears to flow into column B.

When you start typing *Co* in cell A6, AutoComplete displays a ScreenTip suggesting a previous text entry starting with *Co—Computer System*—but keep typing to enter *Color Laser Printer* instead. You just entered the product labels to describe the data on each row.

e. Click **cell B4** to make it the active cell. Type **Cost** and press **Tab**.

Instead of pressing Enter to move down column B, you pressed Tab to make the cell to the right the active cell.

f. Type the following text in the respective cells, pressing **Tab** after typing each column heading:

- **Markup Rate** in **cell C4**
- **Retail Price** in **cell D4**
- **Percent Off** in **cell E4**
- **Sale Price** in **cell F4**
- **Profit Margin** in **cell G4**

Notice that the text looks cut off when you enter data in the cell to the right. Do not worry about this now. You will adjust column widths and formatting later in this chapter.

TROUBLESHOOTING: If you notice a typographical error, click in the cell containing the error, and then retype the label. Or press F2 to edit the cell contents, move the insertion point using the arrow keys, press Backspace or Delete to delete the incorrect characters, type the correct characters, and then press Enter. If you type a label in an incorrect cell, click the cell, and then press Delete.

FYI

g. Save the changes you made to the workbook.

You should develop a habit of saving periodically. That way if your system unexpectedly shuts down, you won't lose everything you worked on.

STEP 2 ENTER UNFORMATTED VALUES

Now that you have entered the descriptive labels, you need to enter the cost, markup rate, and percent off for each product. Refer to Figure 6 as you complete Step 2.

	A	B	C	D	E	F	G	H
1	OK Office Systems Pricing Information							
2	1-Sep-12							
3								
4	Product	Cost	Markup Ra	Retail Pric	Percent O	Sale Price	Profit Margin	
5	Computer	400	0.5		0.15			
6	Color Lase	457.7	0.75		0.2			
7	Filing Cab	68.75	0.905		0.1			
8	Desk Chai	75	1		0.25			
9	Solid Oak	700	1.857		0.3			
10	28" Monit	195	0.835		0.1			
11								
12								

FIGURE 6 Unformatted Values ➤

a. Click **cell B5** to make it the active cell.

You are ready to enter the amount each product cost your company.

b. Type **400** and press **Enter**.

c. Type the remaining costs in **cells B6** through **B10** as shown in Figure 6.

TIP Numeric Keypad

To improve your productivity, you should use the numeric keypad on the right side of your keyboard if your keyboard contains a numeric keypad. If you use a laptop, you can purchase a separate numeric keypad device to use. It is much faster to type values and use Enter on the number keypad rather than using the numbers on the keyboard. Make sure Num Lock is active before using the keypad to enter values.

d. Click **cell C5**, type **0.5**, and then press **Enter**.

You entered the markup rate as a decimal instead of a percentage. You will apply Percent Style later, but now you can concentrate on data entry. When you enter decimal values less than zero, you can type the period and value without typing the zero first, such as *.5*. Excel will automatically add the zero. You can also enter percentages as 50%, but the approach this textbook takes is to enter raw data without typing formatting such as % and then to use number formatting options through Excel to display formatting symbols.

e. Type the remaining markup rates in **cells C6** through **C10** as shown in Figure 6.

f. Click **cell E5**, type **0.15**, and then press **Enter**.

You entered the markdown or percent off sale value as a decimal.

g. Type the remaining markdown rates in **cells E6** through **E10** as shown in Figure 6, and then save the changes to the workbook.

STEP 3 ENTER A DATE AND CLEAR CELL CONTENTS

As you review the worksheet, you realize you need to provide a date to indicate when the sale starts. Refer to Figure 7 as you complete Step 3.

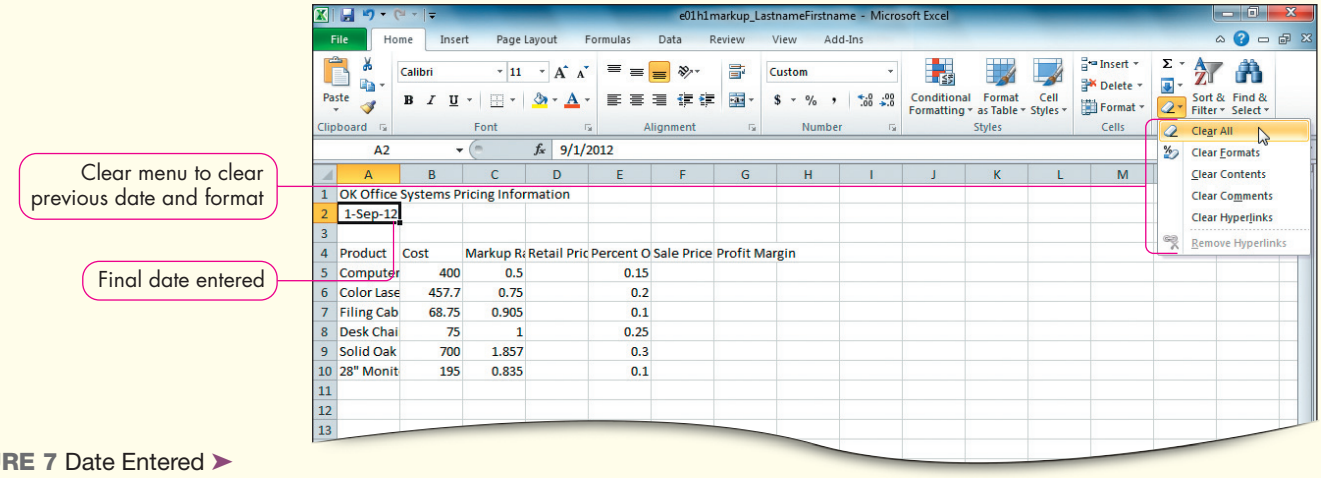


FIGURE 7 Date Entered ➤

a. Click **cell A2**, type **9/1/12**, and then press **Enter**.

The date aligns on the right cell margin by default. Note that Excel displays *9/1/2012* instead of *9/1/12* as you entered.

b. Click **cell A2**. Click **Clear** in the Editing group on the Home tab, and then select **Clear All**.

The Clear All command clears both cell contents and formatting in the selected cell(s).

c. Type **September 1, 2012** in **cell A2**, and then press **Enter**.

When you enter a date in the format *September 1, 2012*, Excel displays the date in the customer number format: *1-Sep-12*. However, you can select a date number format in the Format Cells dialog box.

d. Save the workbook. Keep the workbook onscreen if you plan to continue with Hands-On Exercise 2. If not, close the workbook and exit Excel.

Mathematics and Formulas

Formulas transform otherwise static numbers into meaningful results that can update as values change. For example, a payroll manager can build formulas to calculate the gross pay, deductions, and net pay for an organization's employees, or a doctoral student can create formulas to perform various statistical calculations to interpret his or her research data.

Formulas transform otherwise static numbers into meaningful results.

You can use formulas to help you analyze how results will change as the input data change. You can change the value of your assumptions or inputs and explore the results quickly and accurately. For example, if the interest rate changes from 4% to 5%, how would that affect your monthly payment? Analyzing different input values in Excel is easy after you build formulas. Simply change an input value and observe the change in the formula results.

In this section, you will learn how to use mathematical operations in Excel formulas. You will refresh your memory of mathematical order of precedence and how to construct formulas using cell addresses so that when a value of an input cell changes, the result of the formula changes without you having to modify the formula.

Using Symbols and the Order of Precedence

The four mathematical operations—addition, subtraction, multiplication, and division—are the basis of mathematical calculations. Table 3 lists the common arithmetic operators and their symbols.

TABLE 3 Arithmetic Operators and Symbols

Operation	Common Symbol	Symbol in Excel
Addition	+	+
Subtraction	-	-
Multiplication	X	*
Division	÷	/
Exponentiation	^	^

Enter Cell References in Formulas

Start a formula by typing the equal sign (=), followed by the arithmetic expression. Do not include a space before or after the arithmetic operator. To add the contents of cells A2 and A3, enter =A2+A3 or =A3+A2. Excel uses the value stored in cell A2 (10) and adds it to the value stored in cell A3 (2). The result—12—appears in the cell instead of the formula itself. You can see the formula of the active cell by looking at the Formula Bar. Figure 8 shows a worksheet containing data and results of formulas. The figure also displays the actual formulas used to generate the calculated results.

Input values

Output (formula results)

	A	B	C	D
1	**Contents**		**Description**	**Results**
2	10		First input value	10
3	2		Second input value	2
4	=A2+A3		Sum of 10 and 2	12
5	=A2-A3		Difference between 10 and 2	8
6	=A2*A3		Product of 10 and 2	20
7	=A2/A3		Results of dividing 10 by 2	5
8	=A2^A3		Results of 10 to the 2nd power	100

FIGURE 8 Formula Results ➤

If you type A2+A3 without the equal sign, Excel does not recognize that you entered a formula and stores the data as text.

You should use cell addresses instead of values as references in formulas where possible. You may include values in an input area—such as dates, salary, or costs—that you will need to reference in formulas. Referencing these cells in your formulas, instead of typing the value of the cell to which you are referring, keeps your formulas accurate if the values change. If you change the value of cell A2 to 5, the result of =A2+A3 displays 7 in cell A4. If you had typed actual values in the formula, =10+2, you would have to edit the formula each time a value changes. Always design worksheets in such a way as to be able to change input values without having to modify your formulas if an input value changes later.

TIP Constants in Formulas

Use cell references instead of actual values in formulas, unless the value is a constant. For example, to calculate the reciprocal of a percentage stored in cell B4, type =1-B4. The constant, 1, represents 100%, a value that never changes, although the percentage in cell B4 might change.

Control the Results with the Order of Precedence

Recall the basic rules of performing calculations from a high school or college math class. What is calculated first in the expression =A1+A2*A3? Remember that multiplication is performed before addition, so the value in cell A2 is multiplied by the value in cell A3. Excel then adds the product to the value in cell A1.

The **order of precedence** controls the sequence in which Excel performs arithmetic operations.

The ***order of precedence*** (also called order of operations) is a rule that controls the sequence in which arithmetic operations are performed, which affects the results of the calculation. Excel performs mathematical calculations left to right in this order: **P**arentheses, **E**xponentiation, **M**ultiplication or **D**ivision, and finally **A**ddition or **S**ubtraction. Some people remember the order of precedence with the phrase **P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally. Therefore, if you want to add the values in A1 and A2 and *then* multiply the sum by the value in cell A3, you need to enclose the addition operation in parentheses =(A1+A2)*A3 since anything in parentheses is calculated first. Without parentheses, multiplication has a higher order of precedence than addition and will be calculated first. Figure 9 shows formulas, formula explanations, and formula results based on the order of precedence. The result in cell A12 displays only five digits to the right of the decimal point.

	A	B	C	D
1	10			
2	5			
3	2			
4	4			
5				
6	**Result**		**Formula**	**Explanation**
7	20		=A1+A2*A3	5 x 2 = 10. The product 10 is then added to 10 stored in cell A1.
8	30		=(A1+A2)*A3	10 + 5 = 15. The sum of 15 is then multiplied by 2 stored in cell A3.
9	24		=A1+A2*A3+A4	5 x 2 = 10. 10 + 10 + 4 = 24.
10	90		=(A1+A2)*(A3+A4)	10 + 5 = 15; 2+4 = 6. 15 x 6 = 90.
11	10		=A1/A2+A3*A4	10 / 5 = 2; 2 x 4 = 8; 2 + 8 = 10.
12	5.71429		=A1/(A2+A3)*A4	5 + 2 = 7. 10 / 7 = 1.428571429. 1.42857149 * 4 = 5.714285714

FIGURE 9 Formula Results Based on Order of Precedence ➤

Using Auto Fill

Auto Fill enables you to copy the contents of a cell or cell range or to continue a sequence by dragging the fill handle over an adjacent cell or range of cells.

The **fill handle** is a small black square at the bottom-right corner of a cell.

Auto Fill enables you to copy the contents of a cell or a range of cells by dragging the ***fill handle*** (a small black square appearing in the bottom-right corner of a cell) over an adjacent cell or range of cells. To use Auto Fill, do the following:

1. Click the cell with the content you want to copy to make it the active cell.
2. Position the pointer over the bottom-right corner of the cell until it changes to the fill pointer (a thin black plus sign).
3. Drag the fill handle to repeat the content in other cells.

Copying Formulas with Auto Fill. After you enter a formula in a cell, you can duplicate the formula down a column or across a row without retyping it by using Auto Fill. Excel adapts each copied formula based on the type of cell references in the original formula.

Completing Sequences with Auto Fill. You can also use Auto Fill to complete a sequence. For example, if you enter *January* in a cell, you can use Auto Fill to enter the rest of the months in adjacent cells. Other sequences you can complete are quarters (Qtr 1, etc.), weekdays, and weekday abbreviations, by typing the first item and using Auto Fill to complete the other entries. For numeric values, however, you must specify the first two values in sequence. For example, if you want to fill in 5, 10, 15, and so on, you must enter the first two values in two cells, select the two cells, and then use Auto Fill so that Excel knows to increment by 5. Figure 10 shows the results of filling in months, abbreviated months, quarters, weekdays, abbreviated weekdays, and increments of 5.

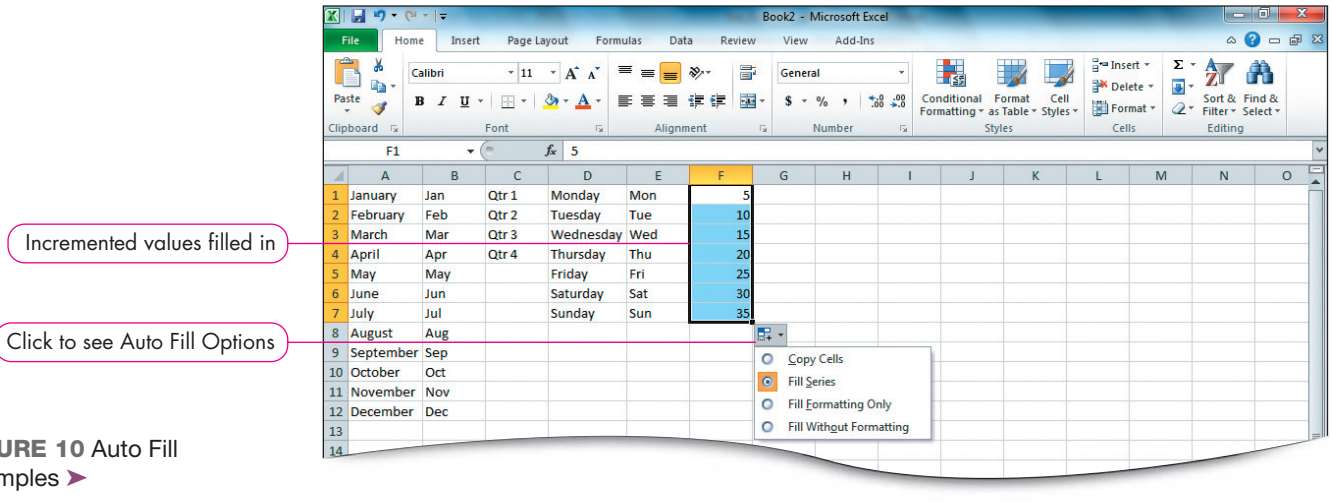


FIGURE 10 Auto Fill Examples ➤

Immediately after you use Auto Fill, Excel displays the Auto Fill Options button in the bottom-right corner of the filled data (see Figure 10). Click the button to display four options: Copy Cells, Fill Series, Fill Formatting Only, or Fill Without Formatting.

TIP Fill Handle

To copy a formula down a column, double-click the fill handle. Excel will copy the formula in the active cell for each row of data to calculate in your worksheet. Cell addresses change automatically during the Auto Fill process. For example, if the original formula is =A1+B1 and you copy the formula down one cell, the copied formula is =A2+B2.

Displaying Cell Formulas

When you enter a formula, Excel shows the result of the formula in the cell (see the top half of Figure 11); however, you might want to display the formulas instead of the calculated results in the cells (see the bottom half of Figure 11). The quickest way to display cell formulas is to press Ctrl and the grave accent (`) key, sometimes referred to as the tilde key, in the top-left corner of the keyboard, below Esc. You can also click Show Formulas in the Formula Auditing group on the Formulas tab to show and hide formulas. This is a toggle feature; do the same step to redisplay formula results.

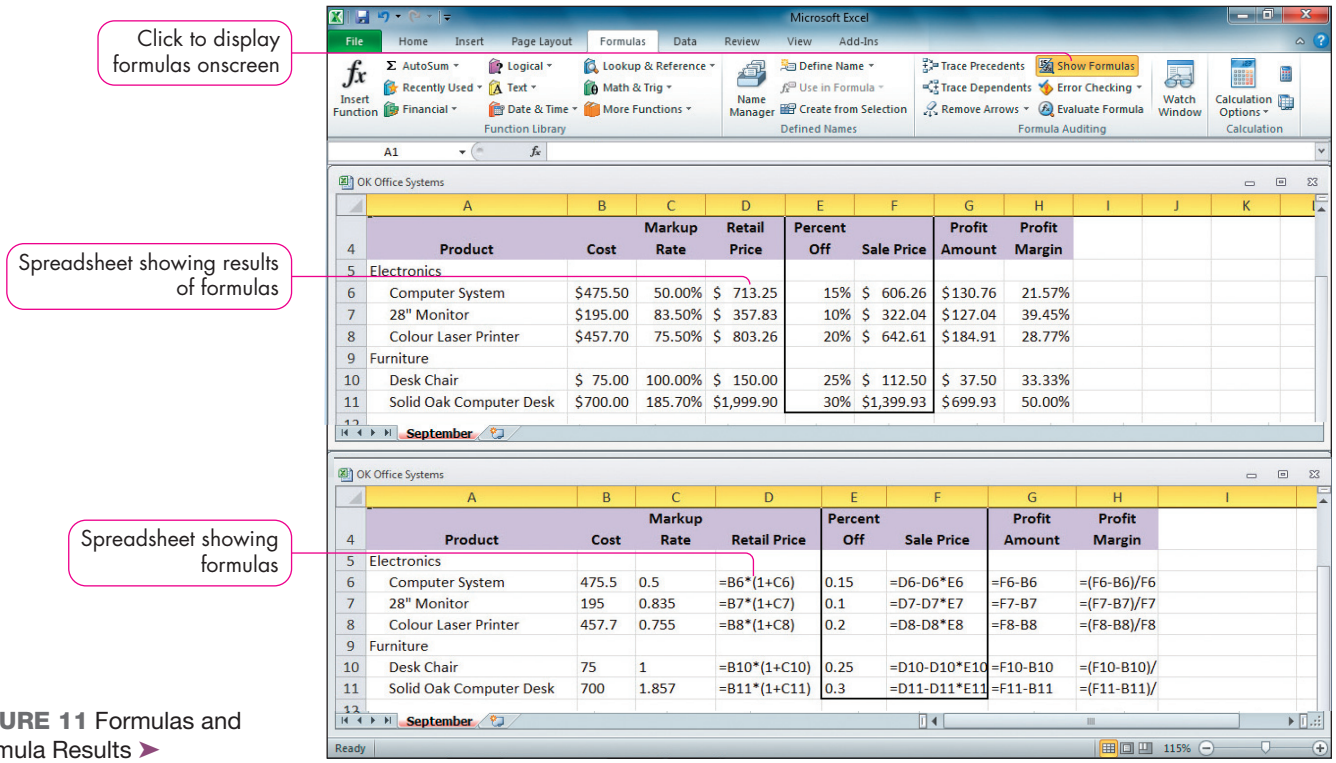


FIGURE 11 Formulas and Formula Results ➤

2 Mathematics and Formulas

In Hands-On Exercise 1, you created the basic worksheet for OKOS by entering text, values, and a date for items on sale this week. Now you need to insert formulas to calculate the missing results—specifically, the retail (before sale) value, sale price, and profit margin. You will use cell addresses in your formulas, so when you change a referenced value, the formula results will update automatically.

Skills covered: Enter the Retail Price Formula • Enter the Sale Price Formula • Enter the Profit Margin Formula • Copy Formulas with Auto Fill • Change Values and Display Formulas

STEP 1 ENTER THE RETAIL PRICE FORMULA

The first formula you need to create is one to calculate the retail price. The retail price is the price you originally charge. It is based on a percentage of the original cost so that you earn a profit. Refer to Figure 12 as you complete Step 1.

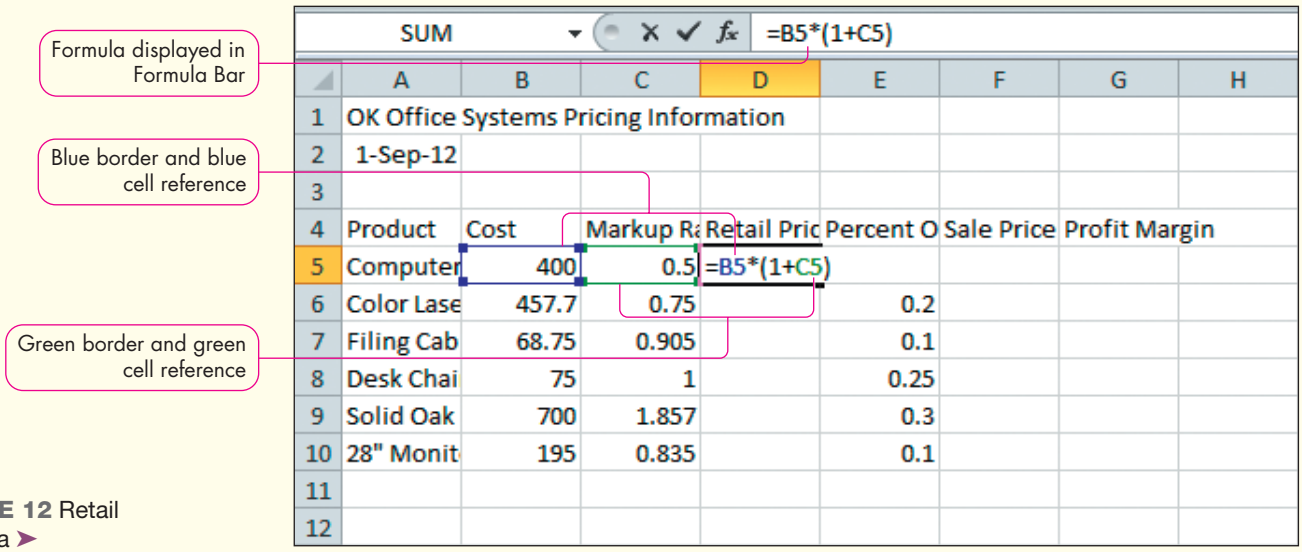


FIGURE 12 Retail Formula ➤

a. Open the *e01h1markup_LastnameFirstname* workbook if you closed it after the last Hands-On Exercise, and then save it as **e01h2markup_LastnameFirstname**, changing *h1* to *h2*.

TROUBLESHOOTING: If you make any major mistakes in this exercise, you can close the file, open *e01h1markup_LastnameFirstname* again, and then start this exercise over.

b. Click **cell D5**, the cell where you will enter the formula to calculate the retail selling price of the first item.

c. Type **=B5*(1+C5)** and view the formula and the coloured cell borders on the screen.

As you type or edit a formula, each cell address in the formula displays in a specific colour, and while you type or edit the formula, the cells referenced in the formula have a temporarily coloured border. For example, in the formula =B5*(1+C5), B5 appears in blue, and C5 appears in green. Cell B5 has a temporarily blue border and cell C5 has a temporarily green border to help you identify cells as you construct your formulas (see Figure 12).

d. Click **Enter** to the left of the Formula Bar and view the formula.

The result of the formula, 600, appears in cell D5, and the formula displays in the Formula Bar. This formula first adds 1 (the decimal equivalent of 100%) to 0.5 (the value stored in cell C5). Excel multiplies that sum of 1.5 by 400 (the value stored in cell B5). The theory behind this formula is that the retail price is 150% of the original cost.

TIP Alternative Formula

An alternative formula also calculates the correct retail price: =B5*C5+B5 or =B5+B5*C5. In this formula, 400 (cell B5) is multiplied by 0.5 (cell C5); that result (200) represents the dollar value of the markup. Excel adds the value 200 to the original cost of 400 to obtain 600, the retail price. You were instructed to enter =B5*(1+C5) to demonstrate the order of precedence.

TROUBLESHOOTING: If the result is not correct, click the cell and look at the formula in the Formula Bar. Click in the Formula Bar, edit the formula to match the formula shown in step 1c, and then click Enter. Make sure you start the formula with an equal sign.

e. Save the workbook with the new formula.

STEP 2 ENTER THE SALE PRICE FORMULA

Now that you calculated the retail price, you want to calculate a sale price. This week, the computer is on sale for 15% off the retail price. Refer to Figure 13 as you complete Step 2.

F5 | fx | =D5-D5*E5

	A	B	C	D	E	F	G	H
1	OK Office Systems Pricing Information							
2	1-Sep-12							
3								
4	Product	Cost	Markup Ra	Retail Pric	Percent O	Sale Price	Profit Margin	
5	Computer	400	0.5	600	0.15	510		
6	Color Lase	457.7	0.75		0.2			
7	Filing Cab	68.75	0.905		0.1			
8	Desk Chai	75	1		0.25			
9	Solid Oak	700	1.857		0.3			
10	28" Monit	195	0.835		0.1			
11								
12								

FIGURE 13 Sale Price Formula ➤

a. Click **cell F5**, the cell where you will enter the formula to calculate the sale price.

b. Type **=D5-D5*E5** and notice the colour-coding in the cell addresses. Press **Ctrl+Enter** to keep the current cell the active cell.

The result is 510. Looking at the formula, you might think D5-D5 equals zero; remember that because of the order of precedence rules, multiplication is calculated before subtraction. The product of 600 (cell D5) and 0.15 (cell E5) equals 90, which is then subtracted from 600 (cell D5), so the sale price is 510. If it helps to understand the formula better, add parentheses: =D5-(D5*E5).

TIP Spot-Check Your Work

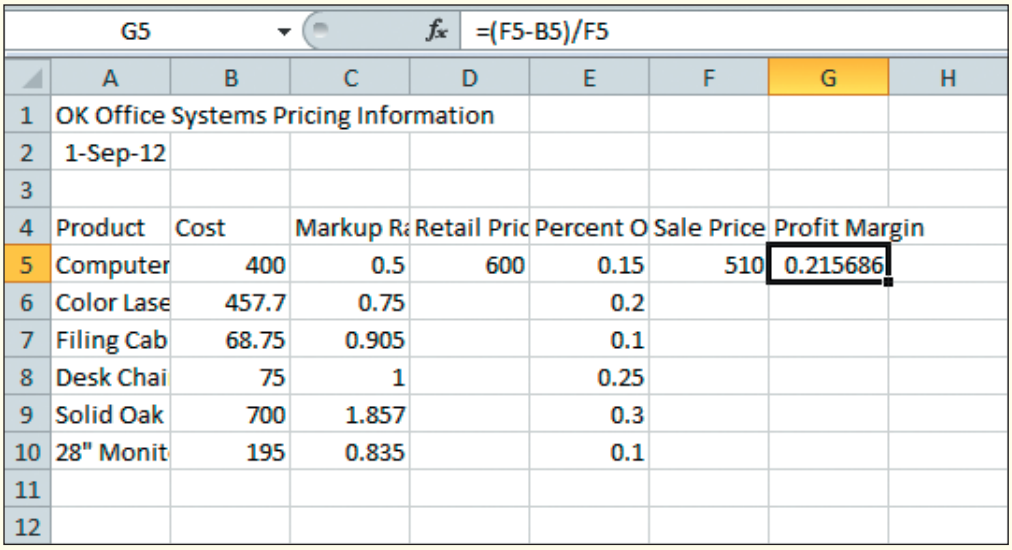
You can check the result for logic. Use a calculator to spot-check the accuracy of formulas. If you mark down merchandise by 15% of its regular price, you are charging 85% of the regular price. You can spot-check your formula to ensure that 85% of 600 is 510 by multiplying 600 by 0.85.

c. View the Formula Bar, and then save the workbook with the new formula.

The Formula Bar displays the formula you entered.

STEP 3 ENTER THE PROFIT MARGIN FORMULA

After calculating the sale price, you want to know the profit margin you earn. You paid $400 for the computer and will sell it for $510. The profit is $110, which gives you a profit margin of 21.57%. Refer to Figure 14 as you complete Step 3.



	A	B	C	D	E	F	G	H
1	OK Office Systems Pricing Information							
2	1-Sep-12							
3								
4	Product	Cost	Markup Ra	Retail Pric	Percent O	Sale Price	Profit Margin	
5	Computer	400	0.5	600	0.15	510	0.215686	
6	Color Lase	457.7	0.75		0.2			
7	Filing Cab	68.75	0.905		0.1			
8	Desk Chai	75	1		0.25			
9	Solid Oak	700	1.857		0.3			
10	28" Monit	195	0.835		0.1			
11								
12								

FIGURE 14 Profit Margin Formula ➤

a. Click **cell G5**, the cell where you will enter the formula to calculate the profit margin.

The profit margin is the profit (difference in sales price and cost) percentage of the sale price. This amount represents the amount to cover operating expenses and tax, which are not covered in this analysis.

b. Type **=(F5-B5)/F5** and notice the colour-coding in the cell addresses. Press **Ctrl+Enter**.

The formula must first calculate the profit, which is the difference between the sale price (510) and the original cost (400). The difference (110) is then divided by the sale price (510) to determine the profit margin of 0.215686, or 21.6%.

TROUBLESHOOTING: If you type a backslash (\) instead of a forward slash (/), Excel will display an error message box. Make sure you type / as the division operator.

c. Look at the Formula Bar, and then save the workbook with the new formula.

The Formula Bar displays the formula you entered.

STEP 4 COPY FORMULAS WITH AUTO FILL

After double-checking the accuracy of your calculations for the first product, you are ready to copy the formulas down the columns to calculate the retail price, sale price, and profit margin for the other products. Refer to Figure 15 as you complete Step 4.

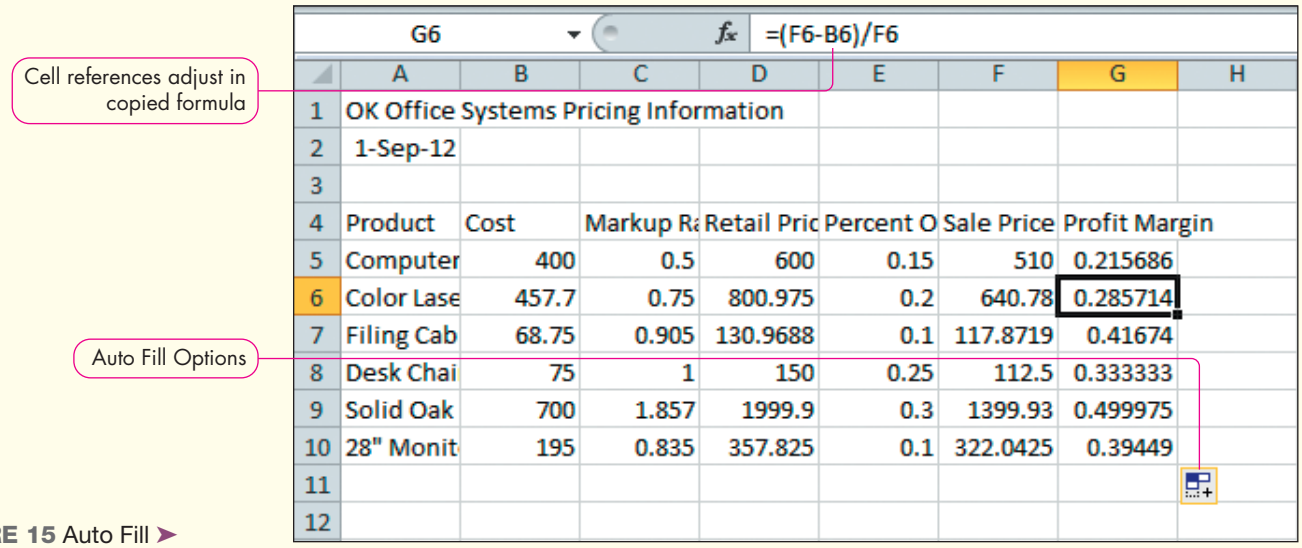


FIGURE 15 Auto Fill ➤

a. Click **cell D5**, the cell containing the formula to calculate the retail price for the first item.

b. Position the mouse pointer on the fill handle in the bottom-right corner of **cell D5**. When the pointer changes from a white plus sign to a thin black plus sign, double-click the **fill handle**.

   Excel's Auto Fill feature copies the retail price formula for the remaining products in your worksheet. Excel detects when to stop copying the formula when it encounters a blank row, such as in row 11.

c. Click **cell D6**, the cell containing the first copied retail price formula, and look at the Formula Bar.

   The original formula was =B5*(1+C5). The copied formula in cell D6 is =B6*(1+C6). Excel adjusts the cell addresses in the formula as it copies the formula down a column so that the results are based on each row's data rather than using the original formula's cell addresses for other products.

d. Select the **range F5:G5**. Double-click the **fill handle** in the bottom-right corner of **cell G5**.

   Auto Fill copies the selected formulas down their respective columns. Notice Auto Fill Options down and to the right of the cell G10 fill handle, indicating you could select different fill options if you want.

e. Click **cell F6**, the cell containing the first copied sale price formula, and view the Formula Bar.

   The original formula was =D5-D5*E5. The copied formula in cell F6 is =D6-D6*E6.

f. Click **cell G6**, the cell containing the first copied profit margin formula, and look at the Formula Bar. Save the changes to your workbook.

   The original formula was =(F5-B5)/F5. The copied formula in cell G6 is =(F6-B6)/F6.

STEP 5 CHANGE VALUES AND DISPLAY FORMULAS

You want to see how the prices and profit margins are affected when you change some of the original values. For example, the supplier might notify you that the cost to you will increase. In addition, you want to see the formulas displayed in the cells temporarily. Refer to Figures 16 and 17 as you complete Step 5.

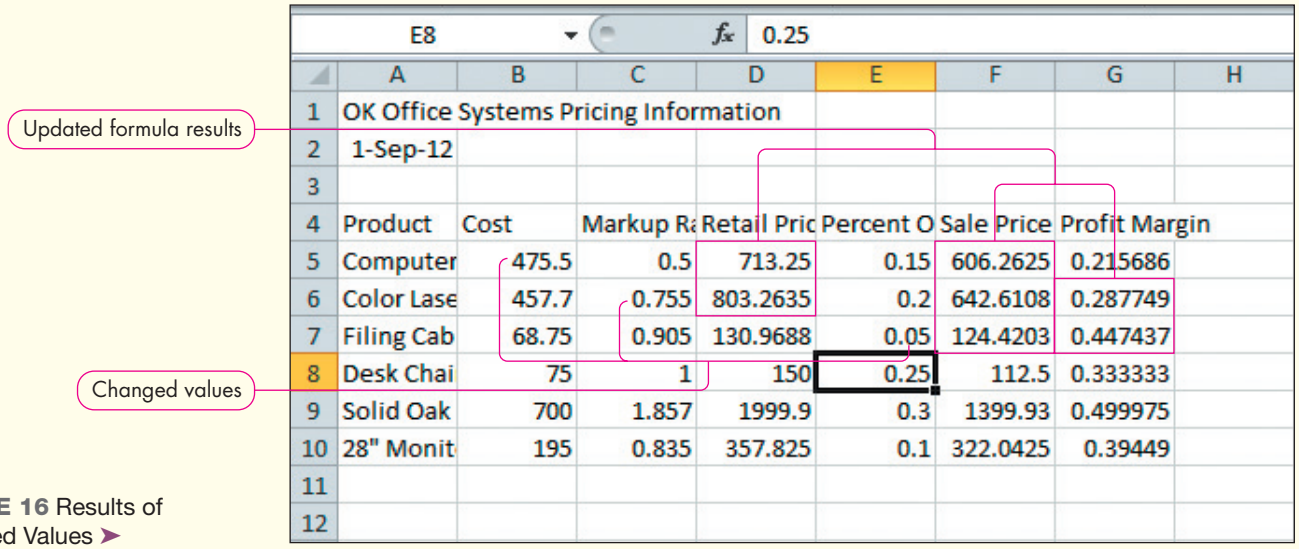


FIGURE 16 Results of Changed Values ➤

a. Click **cell B5**, type **475.5**, and then press **Enter**.

The results of the retail price, sale price, and profit margin formulas change based on the new cost.

b. Click **cell C6**, type **0.755**, and then press **Enter**.

The results of the retail price, sale price, and profit margin formulas change based on the new markup rate.

c. Click **cell E7**, type **0.05**, and then press **Enter**.

The results of the sale price and profit margin formulas change based on the new markdown rate. Note that the retail price did not change since that formula is not based on the markdown rate.

d. Press **Ctrl**+` (the grave accent mark).

The workbook now displays the formulas rather than the formula results (see Figure 17). This is helpful when you want to review several formulas at one time.

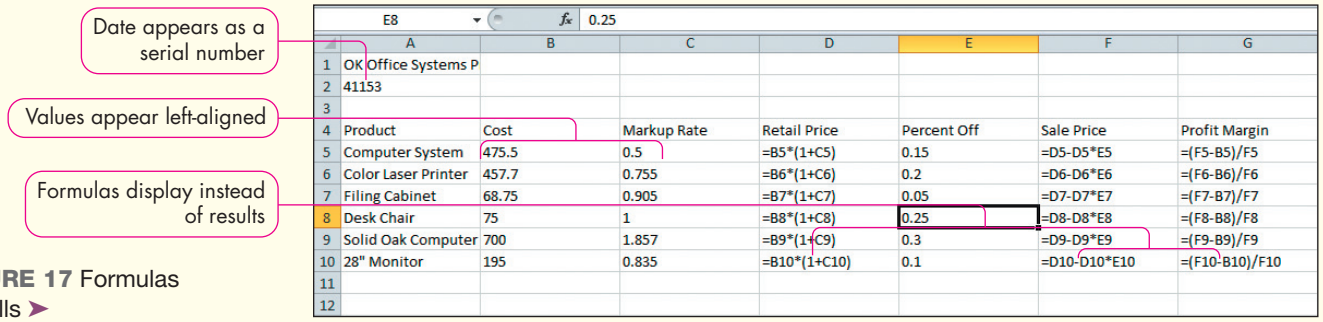


FIGURE 17 Formulas in Cells ➤

e. Press **Ctrl**+` (the grave accent mark).

The workbook now displays the formula results in the cells again.

f. Save the workbook. Keep the workbook onscreen if you plan to continue with Hands-On Exercise 3. If not, close the workbook and exit Excel.

Workbook and Worksheet Management

When you start a new blank workbook in Excel, the workbook contains three worksheets named Sheet1, Sheet2, and Sheet3. The text, values, dates, and formulas you enter into the individual sheets are saved under the one workbook file name. Having multiple worksheets in one workbook is helpful to keep related items together. For example, you might want one worksheet for each month to track your monthly income and expenses for one year. When tax time rolls around, you have all your data stored in one workbook file.

Although you should plan the worksheet and workbook before you start entering data, you might need to add, delete, or rename worksheets. Furthermore, within a worksheet you may want to insert a new row to accommodate new data, delete a column that you no longer need, adjust the size of columns and rows, or move or copy data to other locations.

In this section, you will learn how to manage workbooks by renaming, inserting, and deleting worksheets. You will also learn how to make changes to worksheet columns and rows, such as inserting, deleting, and adjusting sizes. Finally, you will learn how to move and copy data within a worksheet.

Managing Worksheets

Creating a multiple-worksheet workbook takes some planning and maintenance. Worksheet tab names should reflect the contents of the respective worksheets. In addition, you can insert, copy, move, and delete worksheets within the workbook. You can even apply background colour to the worksheet tabs so that they stand out onscreen. Figure 18 shows a workbook in which the sheet tabs have been renamed, colours have been applied to worksheet tabs, and a worksheet tab has been right-clicked so that the shortcut menu appears.

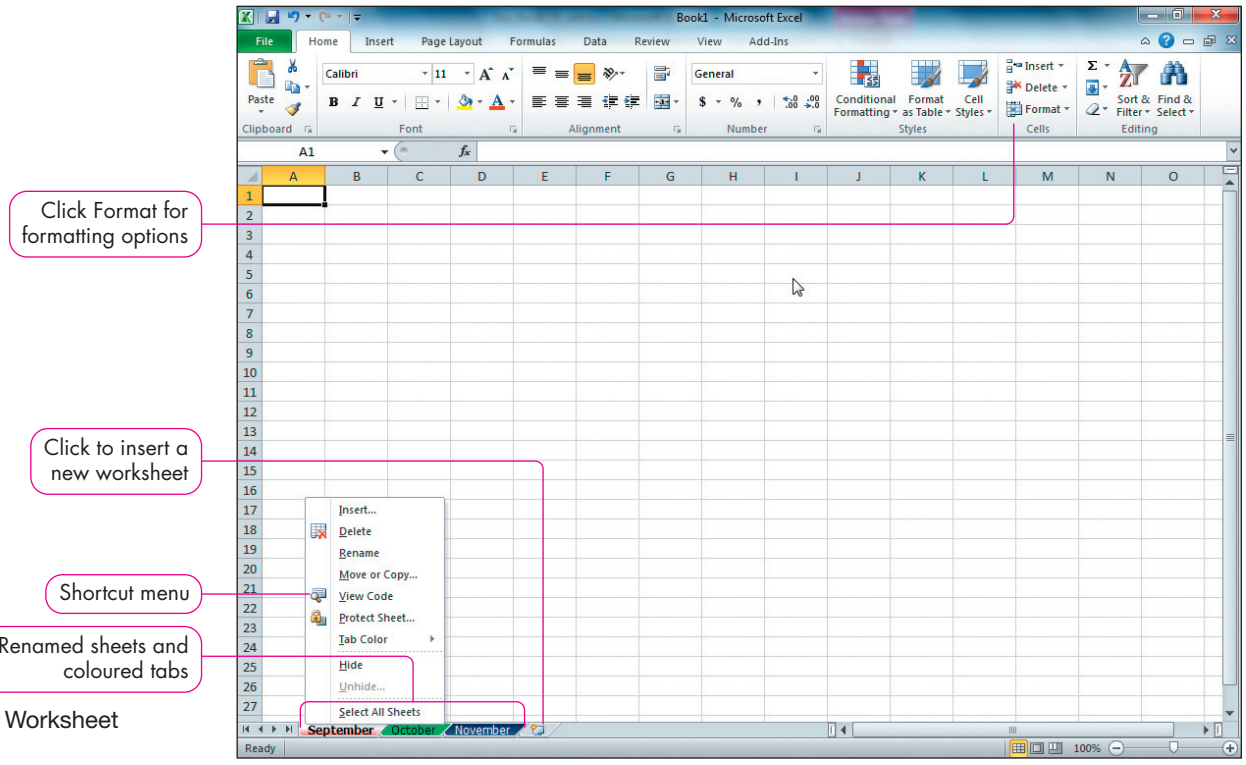


FIGURE 18 Worksheet Tabs ➤

Rename Worksheets

The default worksheet names—Sheet1, Sheet2, and Sheet3—are vague; they do not describe the contents of each worksheet. You should rename the worksheet tabs to reflect the sheet contents so that you, and anyone with whom you share your workbook, will be able to find data. For example, if your budget workbook contains monthly worksheets, name the worksheets *September*, *October*, etc. A teacher who uses a workbook to store a grade book for several classes should name each worksheet by class name or number, such as *MIS 1000* and *MIS 3430*. Although you can have spaces in worksheet names, you should keep worksheet names relatively short. The longer the worksheet names, the fewer sheet tabs you will see at the bottom of the workbook window without scrolling.

To rename a worksheet, do one of the following:

- Double-click a sheet tab, type the new name, and then press Enter.
- Click Format in the Cells group on the Home tab (see Figure 18), select Rename Sheet (see Figure 19), type the new sheet name, and then press Enter.
- Right-click the sheet tab, select Rename from the shortcut menu (see Figure 18), type the new sheet name, and then press Enter.

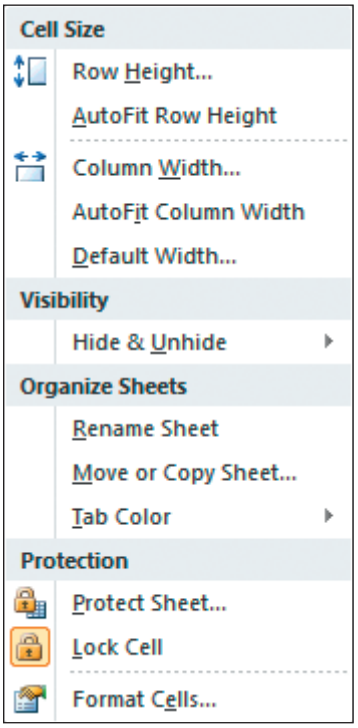


FIGURE 19 Format Menu ➤

Change Worksheet Tab Colour

The active worksheet tab is white, whereas the default colour of the tabs depends on the Windows colour scheme. When you use multiple worksheets, you might want to apply a different colour to each worksheet tab to make the tab stand out or to emphasize the difference between sheets. For example, you might apply red to the September tab, green to the October tab, and dark blue to the November tab.

To change the colour of a worksheet tab, do one of the following:

- Click Format in the Cells group on the Home tab (see Figure 18), point to Tab Color (see Figure 19), and then click a colour on the Tab Color palette.
- Right-click the sheet tab, point to Tab Color on the shortcut menu (see Figure 18), and then click a colour on the Tab Color palette.

Insert, Delete, Move, and Copy Worksheets

Sometimes you need more worksheets in the workbook than the three default sheets. For example, you might create a workbook that contains 12 worksheets—a worksheet for each month of the year. Each new worksheet you insert starts with a default name, such as Sheet4, numbered consecutively after the last Sheet#. After inserting worksheets, you can rename them to be more descriptive. You can delete extra worksheets from your workbook to keep it streamlined.

To insert a new worksheet, do one of the following:

- Click Insert Worksheet to the right of the last worksheet tab.
- Click the Insert arrow—either to the right or below Insert—in the Cells group on the Home tab, and then select Insert Sheet.
- Right-click any sheet tab, select Insert from the shortcut menu (see Figure 18), click Worksheet in the Insert dialog box, and then click OK.
- Press Shift+F11.

To delete a worksheet in a workbook, do one of the following:

- Click the Delete arrow—either to the right or below Delete—in the Cells group on the Home tab, and then select Delete Sheet.
- Right-click any sheet tab, and select Delete from the shortcut menu (see Figure 18).

Ribbon Commands with Arrows

Some commands, such as Insert in the Cells group, contain two parts: the main command and an arrow. The arrow may be below or to the right of the command, depending on the command, window size, or screen resolution. Instructions in the Exploring Series use the command name to instruct you to click the main command to perform the default action, such as "Click Insert in the Cells group" or "Click Delete in the Cells group." Instructions include the word *arrow* when you need to select an additional option, such as "Click the Insert arrow in the Cells group" or "Click the Delete arrow in the Cells group."

After inserting and deleting worksheets, you can arrange the worksheet tabs in a different sequence, especially if the newly inserted worksheets do not fall within a logical sequence.

To move a worksheet, do one of the following:

- Drag a worksheet tab to the desired location. As you drag a sheet tab, the pointer resembles a piece of paper. A down-pointing triangle appears between sheet tabs to indicate where the sheet will be moved when you release the mouse button.
- Click Format in the Cells group on the Home tab (see Figure 18) or right-click the sheet tab you want to move, and select Move or Copy to see the Move or Copy dialog box (see Figure 20). Select the workbook if you want to move the sheet to another workbook. In the *Before sheet* list, select the worksheet on whose left side you want the moved worksheet to be located, and then click OK. For example, assume the October worksheet was selected before displaying the dialog box. You then select November so that the October sheet moves before (or to the left) of November.

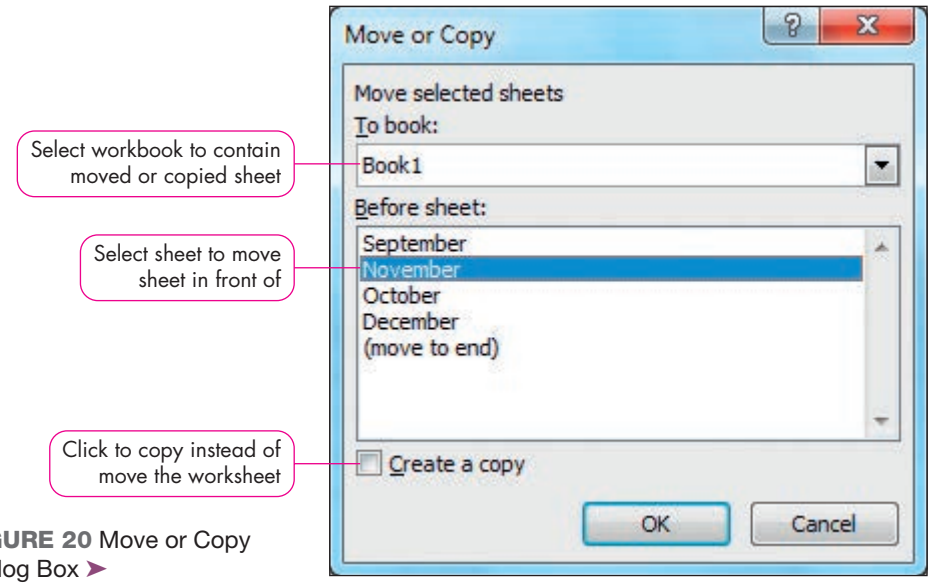


FIGURE 20 Move or Copy Dialog Box ➤

The process for copying a worksheet is similar to moving a sheet. To copy a worksheet, press and hold Ctrl as you drag the worksheet tab. Alternatively, display the Move or Copy dialog box, select the options (see Figure 20), click the *Create a copy* check box, and then click OK.

Managing Columns and Rows

As you enter and edit worksheet data, you can adjust the row and column structure. You can add rows and columns to accommodate new data, or you can delete data you no longer need. Adjusting the height and width of columns and rows can present the data better.

Insert Cells, Columns, and Rows

After you construct a worksheet, you might need to insert cells, columns, or rows to accommodate new data. For example, you might need to insert a new column to perform calculations or a new row to list a new product. When you insert cells, rows, and columns, cell addresses in formulas adjust automatically.

To insert a new column or row, do one of the following:

- Click in the column or row for which you want to insert a new column to the left or a new row above, respectively. Click the Insert arrow in the Cells group on the Home tab, and then select Insert Sheet Columns or Insert Sheet Rows.
- Right-click the column letter or row number for which you want to insert a new column to the left or a new row above, respectively, and select Insert from the shortcut menu.

Excel inserts new columns to the *left* of the current column and new rows *above* the current row. If the current column is column C and you insert a new column, the new column becomes column C, and the original column C data are now in column D. Likewise, if the current row is 5 and you insert a new row, the new row is row 5, and the original row 5 data are now in row 6.

You can insert a single cell in a particular row or column. To insert a cell, click in the cell where you want the new cell, click the Insert arrow in the Cells group on the Home tab, and then select Insert Cells. Select an option from the Insert dialog box (see Figure 21) to position the new cell, and then click OK. Alternatively, click Insert in the Cells group. The default action of clicking Insert is to insert a cell at the current location, which moves existing data

down in that column only. Inserting a cell is helpful when you realize that you left out an entry in one column after you have entered columns of data. Instead of inserting a new row for all columns, you just want to move the existing content down in one column to enter the missing value.

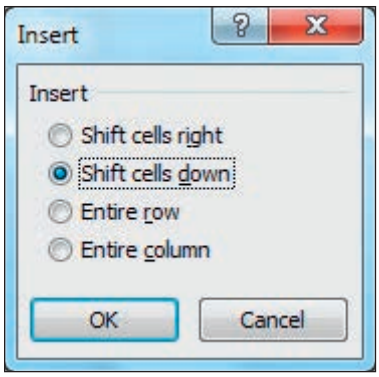


FIGURE 21 Insert Dialog Box ➤

Delete Cells, Columns, and Rows

If you no longer need a cell, column, or row, you can delete it. In these situations, you are deleting the entire cell, column, or row, not just the contents of the cell to leave empty cells. As with inserting new cells, any affected formulas adjust the cell references automatically. To delete a column or row, do one of the following:

- Click the column or row heading for the column or row you want to delete. Click Delete in the Cells group on the Home tab.
- Click in any cell within the column or row you want to delete. Click the Delete arrow in the Cells group on the Home tab, and then select Delete Sheet Columns or Delete Sheet Rows, respectively.
- Right-click the column letter or row number for the column or row you want to delete, and then select Delete from the shortcut menu.

To delete a cell or cells, select the cell(s), click the Delete arrow in the Cells group, and then select Delete Cells to display the Delete dialog box (see Figure 22). Click the appropriate option to shift cells left or up, and then click OK. Alternatively, click Delete in the Cells group. The default action of clicking Delete is to delete the active cell, which moves existing data up in that column only.

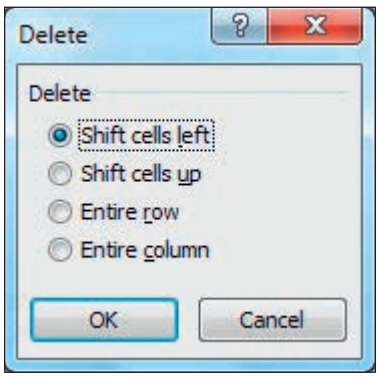


FIGURE 22 Delete Dialog Box ➤

Adjust Column Width

Column width is the horizontal measurement of a column.

After you enter data in a column, you often need to adjust the ***column width***—the number of characters that can fit horizontally using the default font or the number of horizontal pixels—to show the contents of cells. For example, in the worksheet you created in Hands-On Exercises 1 and 2, the labels in column A displayed into column B when those adjacent cells

were empty. However, after you typed values in column B, the labels in column A appeared truncated, or cut off. You will need to widen column A to show the full name of all of your products. Numbers appear as a series of pound signs (######) when the cell is too narrow to display the complete value, and text appears to be truncated.

To widen a column to accommodate the longest label or value in a column, do one of the following:

- Position the pointer on the vertical border between the current column heading and the next column heading. When the pointer displays as a two-headed arrow, double-click the border. For example, if column B is too narrow to display the content in that column, double-click the border between the column B and C headings.
- Click Format in the Cells group on the Home tab (see Figure 18), and then select AutoFit Column Width (see Figure 19).

You can drag the vertical border to the left to decrease the column width or to the right to increase the column width. As you drag the vertical border, Excel displays a ScreenTip specifying the width (see Figure 23). Excel column widths range from 0 to 255 characters. The final way to change column width is to click Format in the Cells group on the Home tab (see Figure 18), select Column Width (see Figure 19), type a value in the Column width box within the Column Width dialog box, and then click OK.

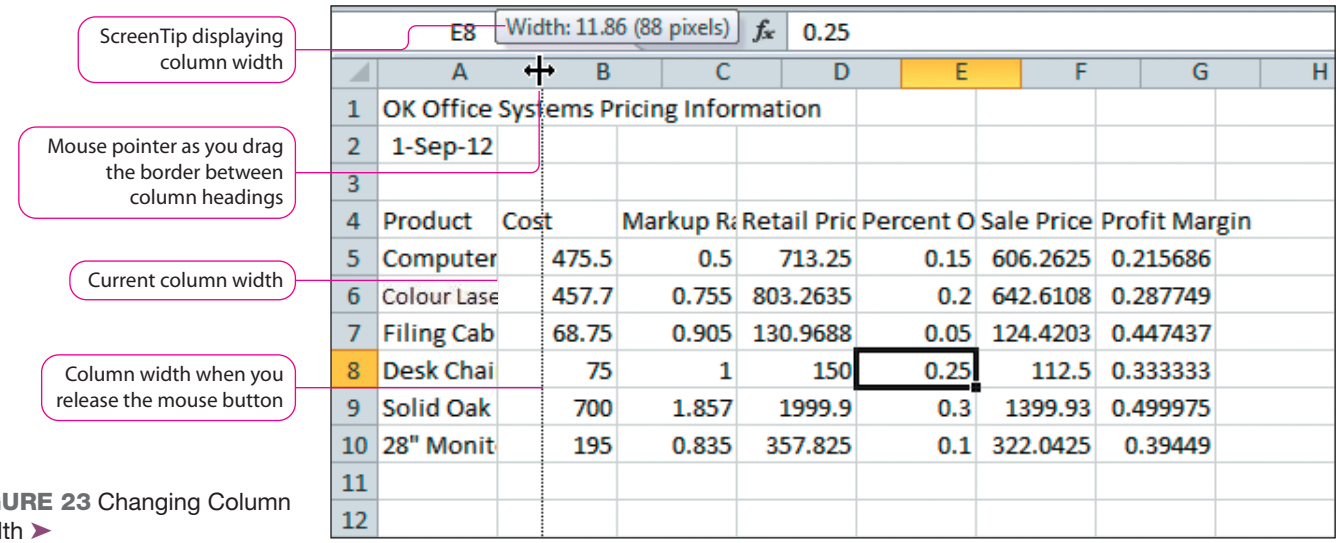


FIGURE 23 Changing Column Width ➤

Adjust Row Height

Row height is the vertical measurement of a row.

When you increase the font size of cell contents, Excel automatically increases the ***row height***—the vertical measurement of the row. However, if you insert a line break to create multiple lines of text in a cell, Excel might not increase the row height. Similar to the way in which you change column width, you can change row height by double-clicking the border between row numbers or by selecting Row Height or AutoFit Row Height from the Format menu (see Figure 19). In Excel, row height is a value between 0 and 409 based on point size (abbreviated as *pt*). Whether you are measuring font sizes or row heights, one point size is equal to 1/183 of a centimetre (1/72 of an inch). Your row height should be taller than your font size. For example, with an 11 pt font size, the default row height is 15.

TIP Multiple Column Widths and Row Heights

You can set the size for more than one column or row at a time to make the selected columns or rows the same size. Drag across the column or row headings for the area you want to format, and then set the size using any method.

Hide and Unhide Columns and Rows

If your worksheet contains confidential information, such as Social Insurance Numbers or salary information, you might need to hide some columns and/or rows before you print a copy for public distribution. When you hide a column or a row, Excel prevents that column or row from displaying or printing. However, the column or row is not deleted. If you hide column B, you will see columns A and C side by side. If you hide row 9, you will see rows 8 and 10 together. Figure 24 shows that column B and row 9 are hidden. Excel displays a thicker border between column headings (such as between A and C), indicating one or more columns are hidden, and between row headings (such as between 8 and 10), indicating one or more rows are hidden.

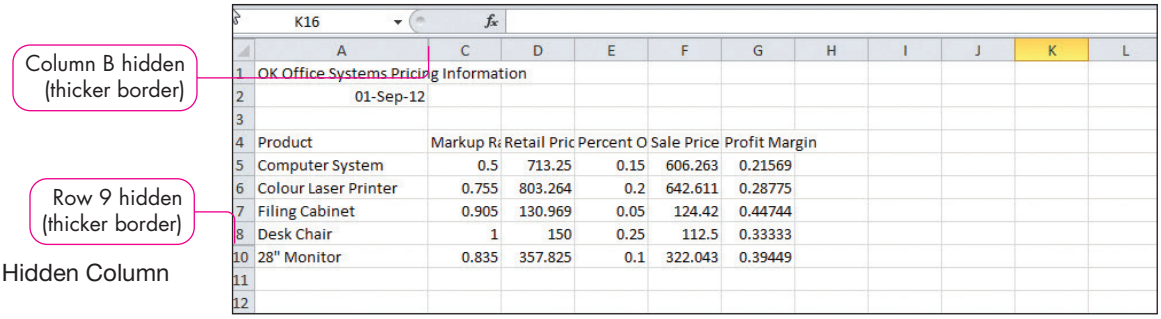


FIGURE 24 Hidden Column and Row ➤

To hide a column or row, do one of the following:

- Click in the column or row you want to hide, click Format in the Cells group on the Home tab (see Figure 18), point to Hide & Unhide (see Figure 19), and then select Hide Columns or Hide Rows, depending on what you want to hide.
- Right-click the column or row heading(s) you want to hide, and then select Hide.

You can hide multiple columns and rows at the same time. To select adjacent columns (such as columns B through E) or adjacent rows (such as rows 2 through 4), drag across the adjacent column or row headings. To hide nonadjacent columns or rows, press and hold down Ctrl while you click the column or row headings. After selecting multiple columns or rows, use any acceptable method to hide the selected columns or rows.

To unhide a column or row, select the columns or rows on both sides of the hidden column or row. For example, if column B is hidden, drag across column letters A and C. Then do one of the following:

- Click Format in the Cells group on the Home tab (see Figure 18), point to Hide & Unhide (see Figure 19), and then select Unhide Columns or Unhide Rows, depending on what you want to display again.
- Right-click the column(s) or row(s) you want to unhide, and then select Unhide.

TIP Unhiding Column A, Row 1, and All Hidden Rows/Columns

Unhiding column A or row 1 is different because you cannot select the row or column on either side. To unhide column A or row 1, type A1 in the Name Box, and then press Enter. Click Format in the Cells group on the Home tab, point to Hide & Unhide, and then select Unhide Columns or Unhide Rows to display column A or row 1, respectively. If you want to unhide all columns and rows, click Select All, and then use the Hide & Unhide submenu.

Selecting, Moving, Copying, and Pasting

The basic tasks of selecting, cutting, copying, and pasting data are somewhat different when working in Excel.

Select a Range

A **range** is a rectangular group of cells.

A ***range*** refers to a group of adjacent or contiguous cells. A range may be as small as a single cell or as large as the entire worksheet. It may consist of a row or part of a row, a column or part of a column, or multiple rows or columns, but will always be a rectangular shape, as you must select the same number of cells in each row or column for the entire range. A range is specified by indicating the top-left and bottom-right cells in the selection. For example, in Figure 25, the date is a single-cell range in cell A2, the Colour Laser Printer data are stored in the range A6:G6, the cost values are stored in the range B5:B10, and the sales prices and profit margins are stored in range F5:G10. A ***nonadjacent range*** contains multiple ranges, such as C5:C10 and E5:E10. At times, you need to select nonadjacent ranges so that you can apply the same formatting at the same time, such as formatting the nonadjacent range C5:C10 and E5:E10 with Percent Style.

A **nonadjacent range** contains multiple ranges of cells.

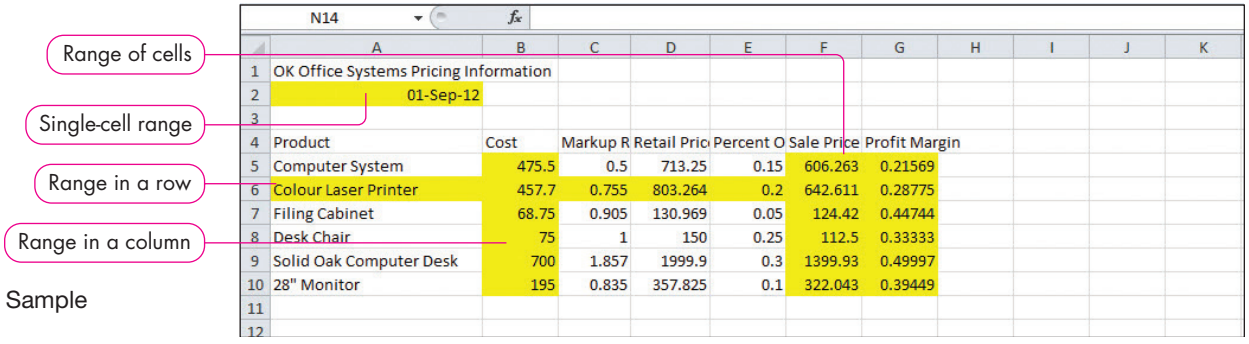


FIGURE 25 Sample Ranges ➤

Table 4 lists methods you can use to select ranges, including nonadjacent ranges.

TABLE 4 Selecting Ranges

To Select:	Do This:
A Range	Click the first cell and drag until you select the entire range. Alternatively, click the first cell in the range, press and hold down Shift, and then click the last cell in the range.
An Entire Column	Click the column heading.
An Entire Row	Click the row heading.
Current Range Containing Data	Click in the range of data and then press Ctrl+A.
All Cells in a Worksheet	Click Select All, or press Ctrl+A twice.
Nonadjacent Range	Select the first range, press and hold down Ctrl, and then select additional range(s).

A border appears around a selected range. Any command you execute will affect the entire range. The range remains selected until you select another range or click in any cell in the worksheet.

Name Box

You can use the Name Box to select a range by clicking in the Name Box, typing a range address such as B15:D25, and then pressing Enter.

Move a Range to Another Location

You can move cell contents from one range to another. For example, you might need to move an input area from the right side of the worksheet to above the output range. When you move a range containing text and values, the text and values do not change. However, any formulas that refer to cells in that range will update to reflect the new cell addresses. To move a range, do the following:

1. Select the range.
2. Use the Cut command to copy the range to the Clipboard. Excel outlines the range you cut with a moving dashed border. Unlike cutting data in other Office applications, the data you cut in Excel remain in their locations until you paste them elsewhere. After you use Cut, the status bar displays *Select destination and press ENTER or choose Paste.*
3. Make sure the destination range—the range where you want to move the data—has enough empty cells. If any cells within the destination range contain data, Excel overwrites that data when you use the Paste command.
4. Click in the top-left corner of the destination range, and then use the Paste command to insert the cut cells and remove them from the original location.

Copy and Paste a Range

You may need to copy cell contents from one range to another. For example, you might copy your January budget to another worksheet to use as a model for creating your February budget. When you copy a range, the original data remain in their original locations. Cell references in copied formulas adjust based on their relative locations to the original data. To copy a range, do the following:

1. Select the range.
2. Use the Copy command to copy the contents of the selected range to the Clipboard. Excel outlines the range you copied with a moving dashed border. After you use Copy, the status bar displays *Select destination and press ENTER or choose Paste.*
3. Make sure the destination range—the range where you want to copy the data—has enough empty cells. If any cells within the destination range contain data, Excel overwrites that data when you use the Paste command.
4. Click in the top-left corner of the destination range where you want the duplicate data, and then use the Paste command. The original selected range remains selected with a moving dashed border around it.
5. Press Esc to deselect the range. Figure 26 shows a selected range and a copy of the range.

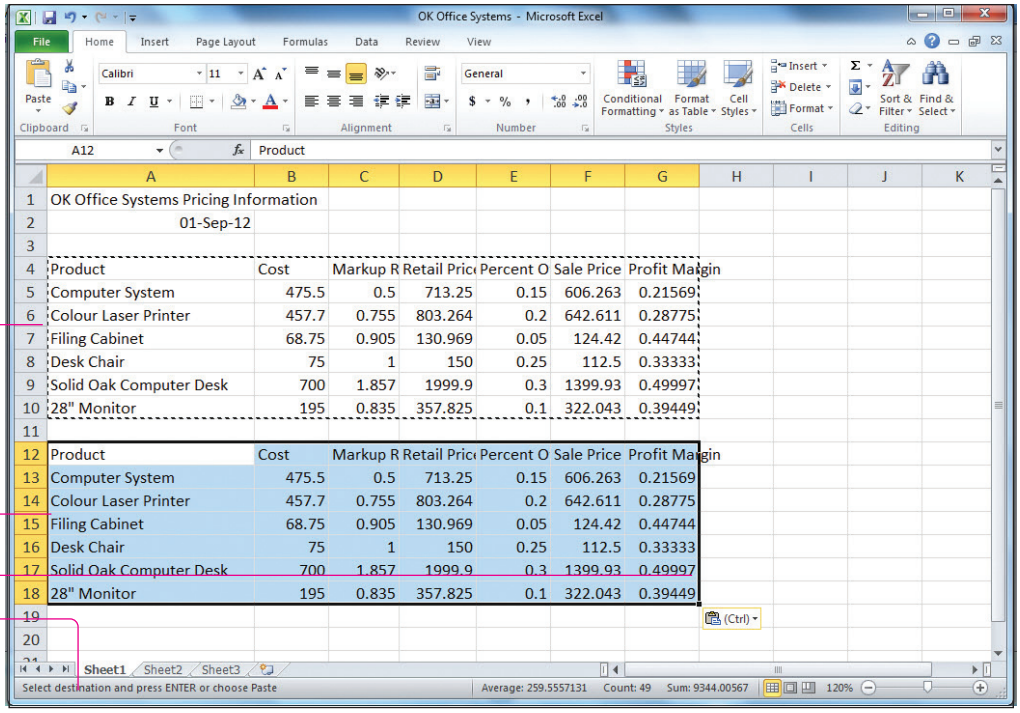


FIGURE 26 Copy and Pasted Range ➤

TIP Copy as Picture

Instead of clicking Copy, if you click the Copy arrow in the Clipboard group, you can select Copy (the default option) or Copy as Picture. When you select Copy as Picture, you copy an *image* of the selected data. You can then paste the image elsewhere in the workbook or in a Word document or PowerPoint presentation. However, when you copy the data as an image, you cannot edit individual cell data when you paste the image.

TIP Paste Options Button

When you copy or paste data, Excel displays Paste Options in the bottom-right corner of the pasted data (see Figure 26). Click Paste Options to see different results for the pasted data.

Use Paste Special

Sometimes you might want to paste data in a different format than they are in in the Clipboard. For example, you might want to copy a range containing formulas and cell references, and paste the range as values in another workbook that does not have the referenced cells. If you want to copy data from Excel and paste them into a Word document, you can paste the Excel data as a worksheet object, as unformatted text, or in another format. To paste data from the Clipboard into a different format, click the Paste arrow in the Clipboard group, and hover over a command to see a ScreenTip and a preview of how the pasted data will look. In Figure 27, the preview shows that a particular paste option will maintain formulas and number formatting; however, it will not maintain the text formatting, such as font colour and centred text. After previewing different paste options, click the one you want in order to apply it.

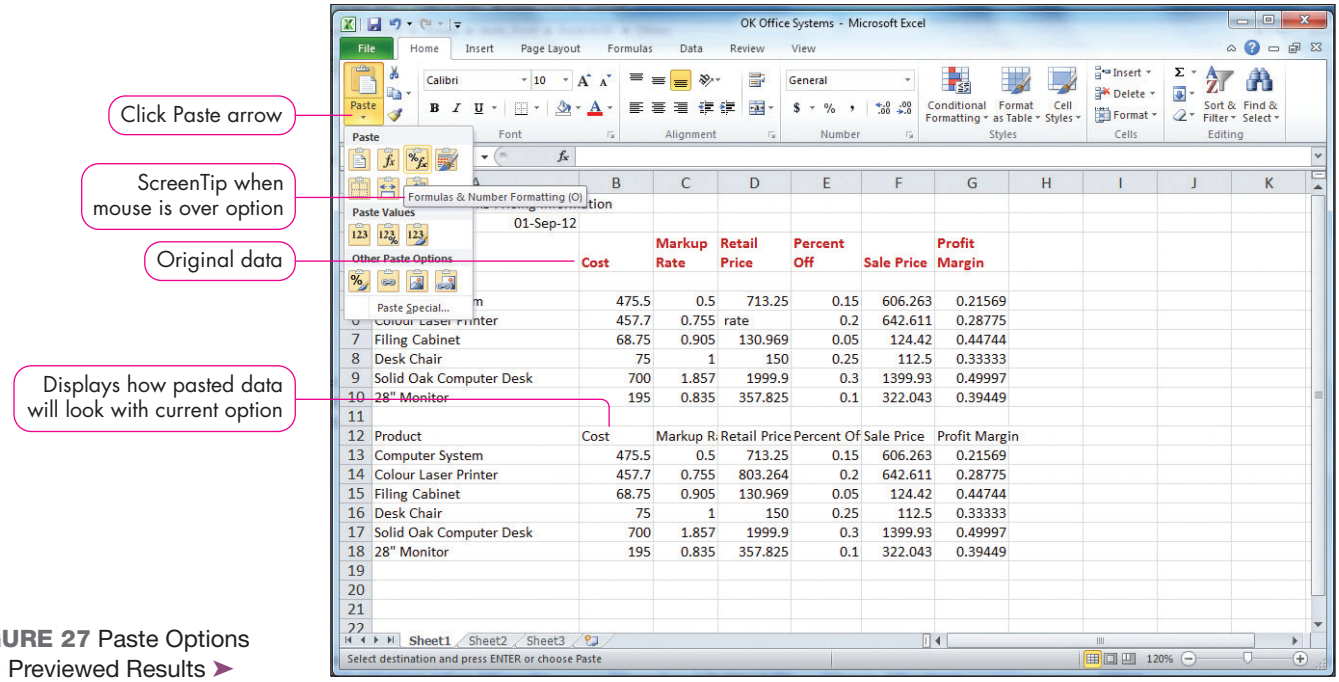


FIGURE 27 Paste Options and Previewed Results ➤

For more specific paste options, click the Paste arrow, and then select Paste Special to display the Paste Special dialog box (see Figure 28). This dialog box contains more options than the Paste menu. Click the desired option, and then click OK.

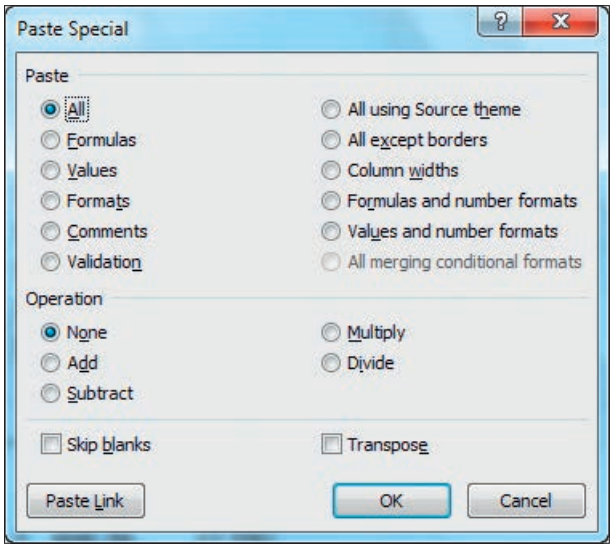


FIGURE 28 Paste Special Dialog Box ➤

TIP Transposing Columns and Rows

After entering data into a worksheet, you might want to transpose the columns and rows so that the data in the first column appear as column labels across the first row, or the column labels in the first row appear in the first column. To transpose worksheet data, select and copy the original range, click the top-left corner of the destination range, click the Paste arrow, and then click Transpose.

3 Workbook and Worksheet Management

After reviewing the OKOS worksheet, you decide to rename the worksheet that contains the data and delete the other sheets. In addition, you decide to move the 28" Monitor data to display below the Computer System row and insert a column to calculate the amount of markup. You also need to adjust column widths to display data.

Skills covered: Manage Worksheets • Delete a Row • Insert a Column and Three Rows • Move a Row • Adjust Column Width and Row Height • Hide and Unhide Columns

STEP 1 MANAGE WORKSHEETS

You want to rename Sheet1 to describe the worksheet contents and add a colour to the sheet tab. In addition, you want to delete the blank worksheets. Refer to Figure 29 as you complete Step 1.

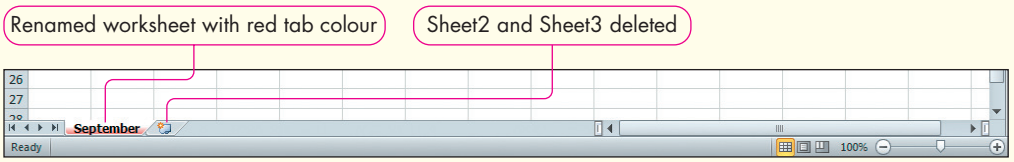


FIGURE 29 Worksheets Managed ➤

a. Open the *e01h2markup_LastnameFirstname* workbook if you closed it after the last Hands-On Exercise, and save it as **e01h3markup_LastnameFirstname**, changing *h2* to *h3*.

b. Double-click the **Sheet1 sheet tab**, type **September**, and then press **Enter**.

You just renamed Sheet1 as September.

c. Right-click the **September sheet tab**, point to **Tab Color**, and then click **Red** in the Standard Colors section.

The worksheet tab colour is red.

d. Click the **Sheet2 sheet tab**, click the **Delete arrow** in the Cells group on the Home tab, and then select **Delete Sheet**.

You deleted the Sheet2 worksheet from the workbook.

TROUBLESHOOTING: Delete in the Cells group, like some other commands in Excel, contains two parts: the main command icon and an arrow. Click the main command icon when instructed to click Delete to perform the default action. Click the arrow when instructed to click the Delete arrow for additional command options.

TROUBLESHOOTING: Notice that Undo is unavailable on the Quick Access Toolbar. You can't undo deleting a worksheet. It is deleted!

e. Right-click the **Sheet3 sheet tab**, and then select **Delete** to delete the sheet. Save the workbook.

STEP 2 DELETE A ROW

You just realized that you do not have enough filing cabinets in stock to offer on sale, so you need to delete the Filing Cabinet row. Refer to Figure 30 as you complete Step 2.

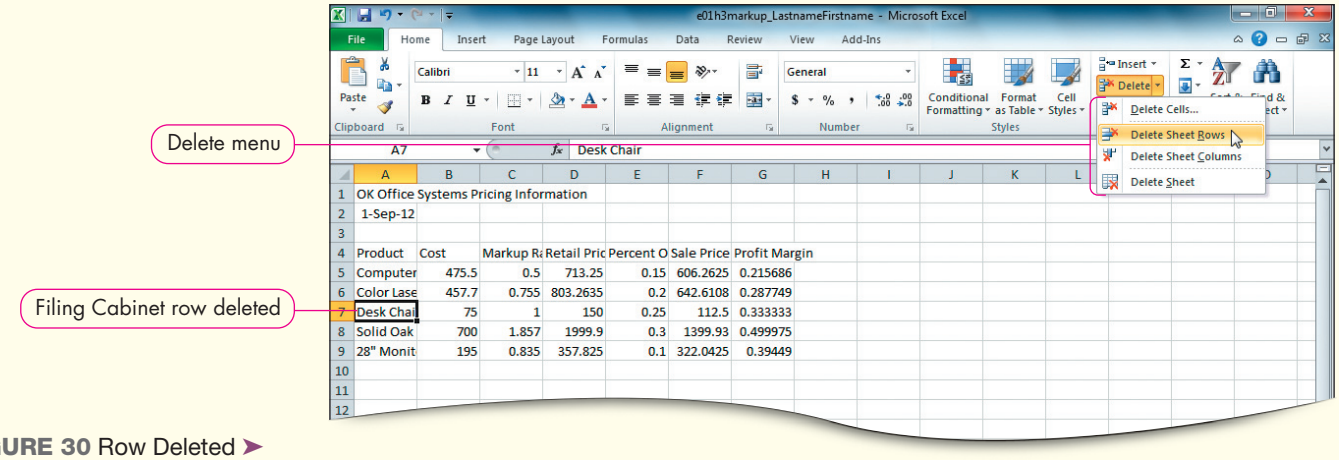


FIGURE 30 Row Deleted ➤

a. Click **cell A7** (or any cell on row 7), the row that contains data for the Filing Cabinet.

b. Click the **Delete arrow** in the Cells group.

c. Select **Delete Sheet Rows**, and then save the workbook.

The Filing Cabinet row is deleted, and the remaining rows move up one row.

TROUBLESHOOTING: If you accidentally delete the wrong row or accidentally select Delete Sheet Columns instead of Delete Sheet Rows, click Undo on the Quick Access Toolbar to restore the deleted row or column.

STEP 3 INSERT A COLUMN AND THREE ROWS

You decide that you need a column to display the amount of profit. Because profit is a dollar amount, you want to keep the profit column close to another column of dollar amounts. Therefore, you will insert the profit column before the profit margin (percentage) column. You also want to insert new rows for product information and category names. Refer to Figure 31 as you complete Step 3.

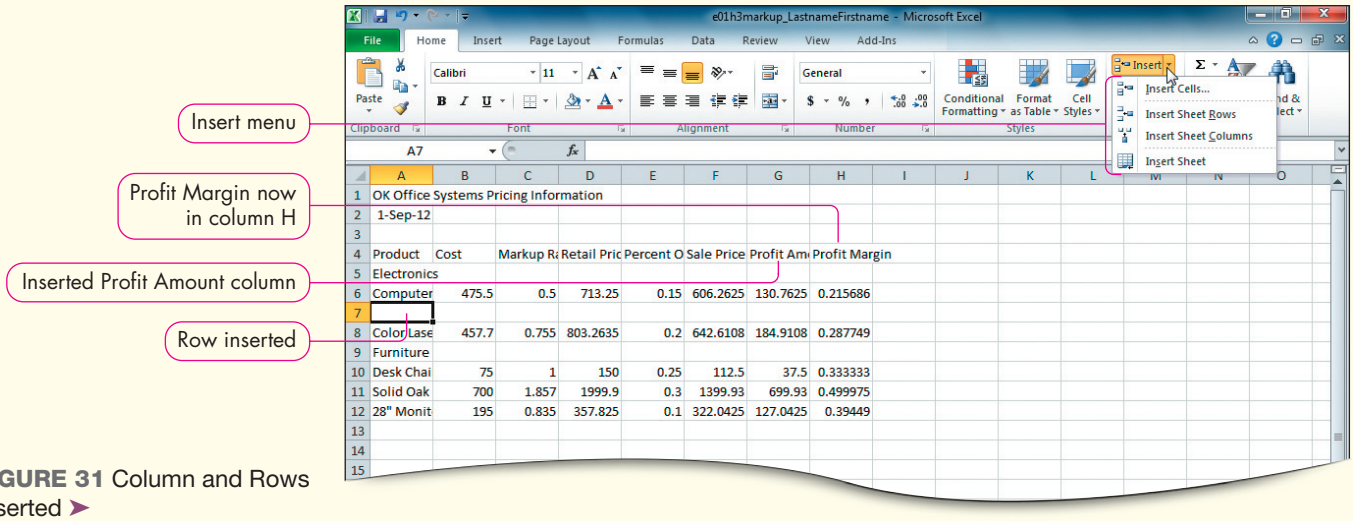


FIGURE 31 Column and Rows Inserted ➤

a. Click **cell G5** (or any cell in column G), the column containing the Profit Margin.

   You want to insert a column between the Sale Price and Profit Margin columns so that you can calculate the profit amount in dollars.

b. Click the **Insert arrow** in the Cells group, and then select **Insert Sheet Columns**.

   You inserted a new, blank column G. The data in the original column G are now in column H.

c. Click **cell G4**, type **Profit Amount**, and then press **Enter**.

d. Make sure the active cell is **cell G5**. Type **=F5-B5** and then click **Enter** to the left of the Formula Bar. Double-click the **fill handle** to copy the formula down the column.

   You calculated the profit amount by subtracting the original cost from the sale price. Although steps e and f below illustrate one way to insert a row, you can use other methods presented in this chapter.

e. Right-click the **row 5 heading**, the row containing the Computer System data.

   Excel displays a shortcut menu consisting of commands you can perform.

f. Select **Insert** from the shortcut menu.

   You inserted a new blank row 5, which is selected. The original rows of data move down a row each.

g. Click **cell A5**. Type **Electronics** and then press **Enter**.

   You entered the category name Electronics above the list of electronic products.

h. Right-click the **row 8 heading**, the row containing the Desk Chair data, and then select **Insert** from the shortcut menu.

i. Click **cell A8**. Type **Furniture** and then press **Enter**.

   You entered the category name Furniture above the list of furniture products. Now you want to insert a blank row after the Computer System row so that you can move the 28" Monitor data to the new row.

j. Insert a row between Computer System and Color Laser Printer. Click **cell A7**, and then save the workbook.

STEP 4 MOVE A ROW

You want to move the 28" Monitor product to be immediately after the Computer System product. You previously inserted a blank row. Now you need to move the monitor row to this empty row. Refer to Figure 32 as you complete Step 4.

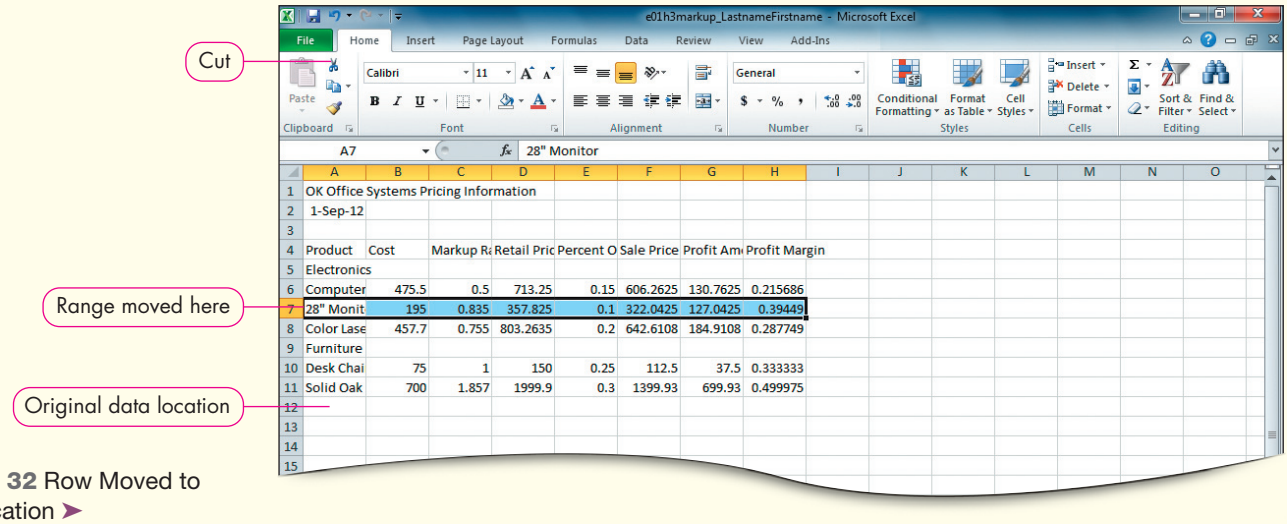


FIGURE 32 Row Moved to New Location ➤

FYI

a. Click **cell A12**, and then drag to select the **range A12:H12**.

You selected the range of cells containing the 28" Monitor data.

b. Cut the selected range.

A moving dashed border outlines the selected range. The status bar displays the message *Select destination and press ENTER or choose Paste.*

c. Click **cell A7**, the new blank row you inserted in step 3j.

This is the first cell in the destination range.

FYI

d. Paste the data that you cut, and then save the workbook.

The 28" Monitor data are now located on row 7.

TROUBLESHOOTING: If you cut and paste a row without inserting a new row first, Excel will overwrite the original row of data, which is why you inserted a new row in step 3.

STEP 5 ADJUST COLUMN WIDTH AND ROW HEIGHT

As you review your worksheet, you notice that the labels in column A appear cut off. You need to increase the width of that column to display the entire product names. In addition, you want to make row 1 taller. Refer to Figure 33 as you complete Step 5.

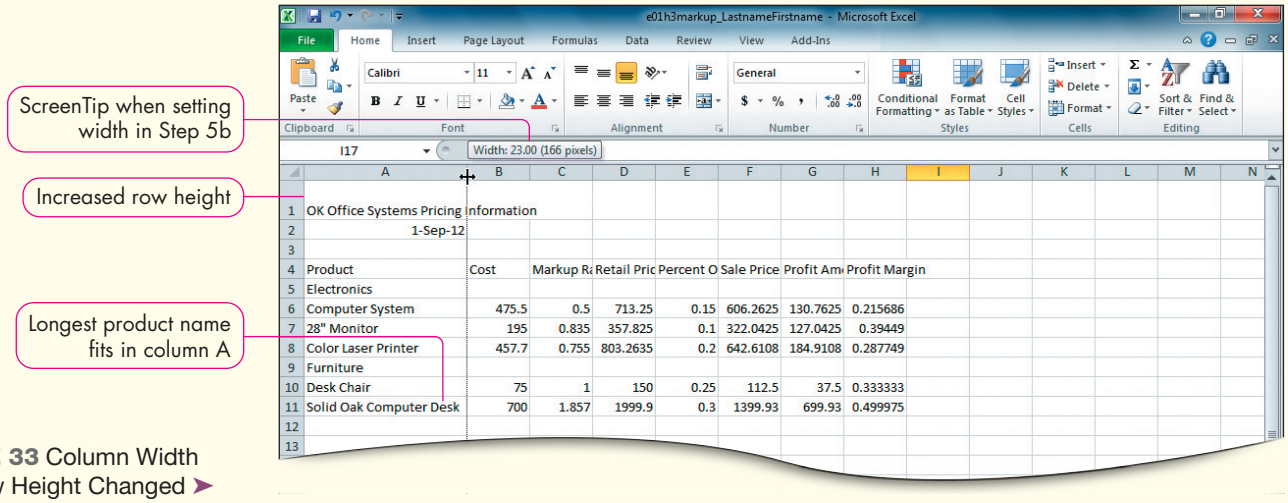


FIGURE 33 Column Width and Row Height Changed ➤

a. Position the pointer between the column A and B headings. When the pointer looks like a double-headed arrow, double-click the **border**.

When you double-click the border between two columns, Excel adjusts the width of the column on the left side of the border to fit the contents of that column. In this case, Excel increased the width of column A. However, it is based on the title in cell A1, which will eventually span over all columns. Therefore, you want to decrease the column to avoid so much empty space in column A.

b. Position the pointer between the column A and B headings again. Drag the border to the left until the ScreenTip displays **Width: 23.00 (166 pixels)**. Release the mouse button.

You decreased the column width to 23 for column A. The longest product name is visible. You won't adjust the other column widths until after you apply formats to the column headings in Hands-On Exercise 4.

c. Click **cell A1**. Click **Format** in the Cells group, and then select **Row Height** to display the Row Height dialog box.

d. Type **30** in the **Row height box**, and then click **OK**. Save the workbook.

You doubled the height of the first row.

STEP 6 HIDE AND UNHIDE COLUMNS

To focus on the dollar amounts, you decide to hide the markup rate, discount rate, and profit margin columns. Refer to Figure 34 as you complete Step 6.

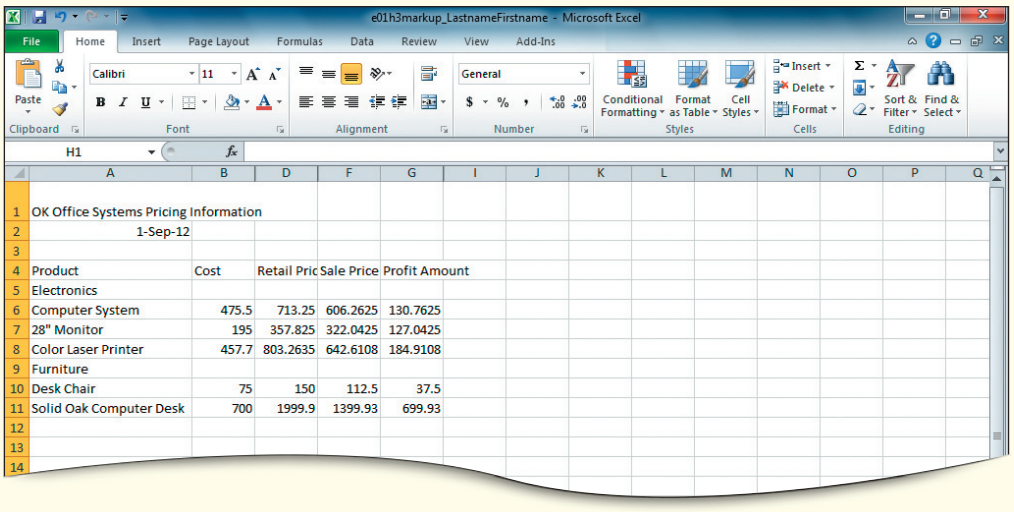


FIGURE 34 Hidden Columns ➤

a. Click the **column C heading**, the column containing the Markup Rate values.

b. Press and hold down **Ctrl** as you click the **column E heading** and the **column H heading**.

Holding down Ctrl enables you to select nonadjacent ranges. You want to hide the rate columns temporarily.

c. Click **Format** in the Cells group, point to **Hide & Unhide**, and then select **Hide Columns**.

Excel hides the selected columns. You see a gap in column heading letters, indicating columns are hidden (see Figure 34).

d. Drag to select the **column G and I headings**.

You want to unhide column H, so you must select the columns on both sides of the hidden column.

e. Click **Format** in the Cells group, point to **Hide & Unhide**, and then select **Unhide Columns**.

Column H, which contains the Profit Margin values, is no longer hidden. You will keep the other columns hidden to save the workbook as evidence that you know how to hide columns. You will unhide the remaining columns in the next Hands-On Exercise.

f. Save the workbook. Keep the workbook onscreen if you plan to continue with Hands-On Exercise 4. If not, close the workbook, and exit Excel.

Formatting

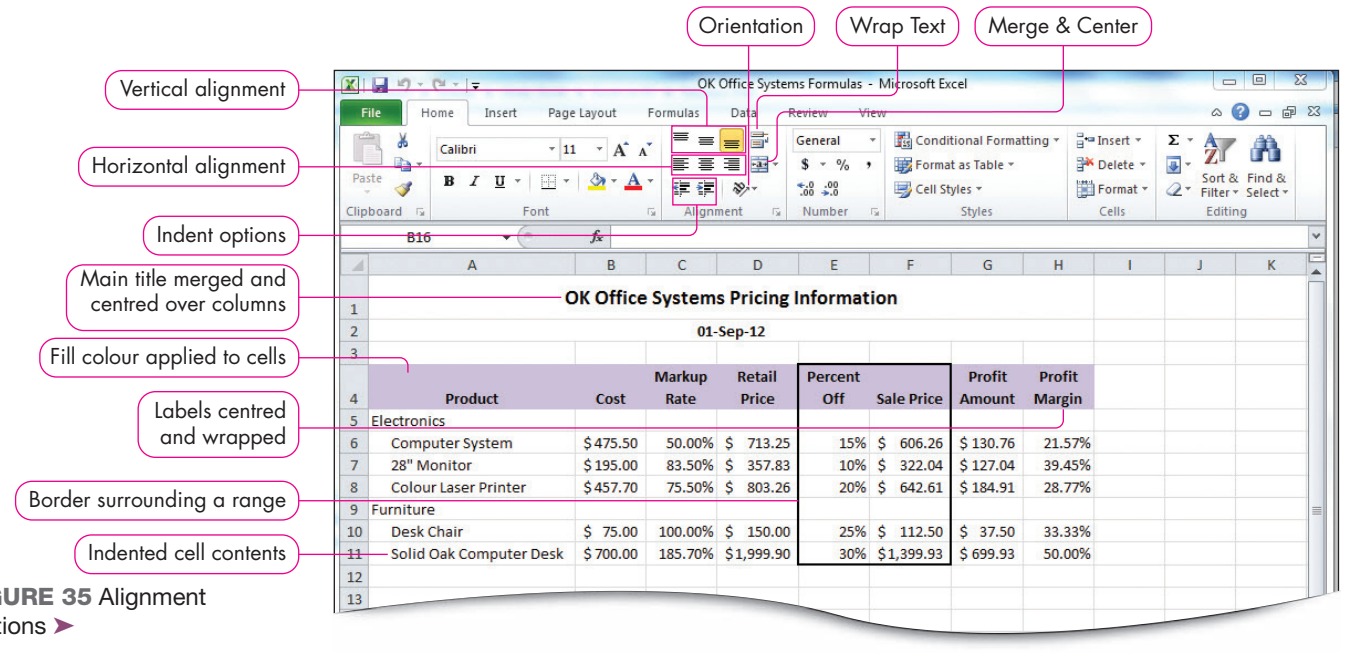
After entering data and formulas, you should format the worksheet to achieve a professional appearance. A professionally formatted worksheet—through adding appropriate symbols, aligning decimals, and using fonts and colours to make data stand out—makes finding and analyzing data easy. You apply different formats to accentuate meaningful details or to draw attention to specific ranges in the worksheet.

Different formats accentuate meaningful details or draw attention to specific ranges.

In this section, you will learn to apply different alignment options, including horizontal and vertical alignment, text wrapping, and indent options. In addition, you will learn how to format different types of values.

Applying Alignment and Font Options

Alignment refers to how data are positioned in cells. By now, you know that text aligns at the left cell margin, and dates and values align at the right cell margin. You can change the alignment of cell contents to improve the appearance of data within the cells. The Alignment group (see Figure 35) on the Home tab contains several features to help you align and format data.



Product	Cost	Markup Rate	Retail Price	Percent Off	Sale Price	Profit Amount	Profit Margin
Electronics							
Computer System	$475.50	50.00%	$ 713.25	15%	$ 606.26	$ 130.76	21.57%
28" Monitor	$195.00	83.50%	$ 357.83	10%	$ 322.04	$ 127.04	39.45%
Colour Laser Printer	$457.70	75.50%	$ 803.26	20%	$ 642.61	$ 184.91	28.77%
Furniture							
Desk Chair	$ 75.00	100.00%	$ 150.00	25%	$ 112.50	$ 37.50	33.33%
Solid Oak Computer Desk	$700.00	185.70%	$1,999.90	30%	$1,399.93	$ 699.93	50.00%

FIGURE 35 Alignment Options ➤

Change Horizontal and Vertical Cell Alignment

Horizontal alignment positions data between the left and right cell margins.

Vertical alignment positions data between the top and bottom cell margins.

You can align data horizontally or vertically. ***Horizontal alignment*** specifies the position of data between the left and right cell margins, and ***vertical alignment*** specifies the position of data between the top and bottom cell margins. Bottom Align is the default vertical alignment, as indicated by the orange background of Bottom Align on the Ribbon. After adjusting row height, you might need to change the vertical alignment to position data better in conjunction with data in adjacent cells. To change alignments, click the desired horizontal and/or vertical alignment setting in the Alignment group on the Home tab.

TIP Rotating Cell Contents

People sometimes rotate headings instead of wrapping text in cells. You can rotate data in a cell by clicking Orientation in the Alignment group on the Home tab. Options include Angle Counterclockwise, Angle Clockwise, Vertical Text, Rotate Text Up, Rotate Text Down, and Format Cell Alignment. To rotate text on an angle, select Format Cell Alignment to open the Format Cells dialog box with the Alignment tab options. You can specify the value for the rotation in the Degrees spin box.

Merge and Centre Labels

You may want to place a title at the top of a worksheet and centre it over the columns of data in the worksheet. You can centre main titles over all columns in the worksheet, and you can centre category titles over groups of related columns. To create a title, enter the text in the far left cell of the range. Select the range of cells across which you want to centre the title, and then click Merge & Center in the Alignment group on the Home tab. Any data in the merge area are lost, except what is in the far left cell in the range. Excel merges the selected cells together into one cell, and the merged cell address is that of the original cell on the left. The data are centred between the left and right sides of the merged cell. In Figure 35, the title *OK Office Systems Pricing Information* is merged and centred over the data columns.

If you merge too many cells and want to split the merged cell back into its original multiple cells, click the merged cell, and then click Merge & Center. Unmerging places the data in the top-left cell.

Increase and Decrease Indent

To offset labels, you can indent text within a cell. Accountants often indent the word Totals in financial statements so that it stands out from a list of items above the total row. Indenting helps others see the hierarchical structure of your spreadsheet data. To indent the contents of a cell, click Increase Indent in the Alignment group on the Home tab. The more you click Increase Indent, the more text is indented in the active cell. To decrease the indent, click Decrease Indent in the Alignment group. Figure 35 shows an example of an indented label.

Wrap Text

Wrap text enables a label to appear on multiple lines within the current cell.

Sometimes you have to maintain specific column widths, but the data do not fit entirely. You can use ***wrap text*** to make data appear on multiple lines by adjusting the row height to fit the cell contents within the column width. When you click Wrap Text in the Alignment group, Excel wraps the text on two or more lines within the cell. This alignment option is helpful when the column headings are wider than the values contained in the column. In the next Hands-On Exercise, you will apply the Wrap Text option for the column headings so that you can see the text without widening the columns. Figure 35 shows an example of wrapped text.

TIP Alignment Options

The Format Cells dialog box also contains options for aligning cell contents. To open the Format Cells dialog box, click the Alignment Dialog Box Launcher in the Alignment group on the Home tab. The Alignment tab in the dialog box contains the options for aligning data.

Apply Borders and Fill Colour

A **border** is a line that surrounds a cell or a range.

You can apply a border or fill colour to accentuate data in a worksheet. A ***border*** is a line that surrounds a cell or a range of cells. You can use borders to offset particular data from the rest of the data on the worksheet. To apply a border, select the cell or range that you want to have a border, click the Borders arrow in the Font group, and then select the desired border type. To remove a border, select No Border from the Borders menu.

Fill color is the background colour appearing behind data in a cell.

To add some colour to your worksheet to add emphasis to data or headers, you can apply a fill colour. ***Fill color*** is a background colour that displays behind the data. You should choose a fill colour that contrasts with the font colour. For example, if the font colour is Black, you might want to choose Yellow fill colour. If the font colour is White, you might want to apply Blue or Dark Blue fill colour. To apply a fill colour, select the cell or range that you want to have a fill colour, click the Fill Color arrow on the Home tab, and then select the colour choice from the Fill Color palette. If you want to remove a fill colour, select No Fill from the bottom of the palette.

For additional border and fill colour options, display the Format Cells dialog box. Click the Border tab to select border options, including the border line style and colour. Click the Fill tab to set the background colour, fill effects, and patterns. Figure 35 shows examples of cells containing a border and fill colour.

Applying Number Formats

Values appear in General format (i.e., no special formatting) when you enter data. You should apply number formats based on the type of values in a cell, such as applying either the Accounting or Currency number format to monetary values. Changing the number format changes the way the number displays in a cell, but the format does not change the number's value. If, for example, you entered 123.456 into a cell and format the cell with Currency number type, the value shows as $123.46 onscreen, but the actual value 123.456 is used for calculations. When you apply a number format, you can specify the number of decimal places to display onscreen.

Select an Appropriate Number Format

The default number format is General, which displays values as you originally enter them. General does not align decimal points in a column or include symbols, such as dollar signs, percent signs, or commas. Table 5 lists and describes the primary number formats in Excel.

TABLE 5 Number Formats

Format Style	Display
General	A number as it was originally entered. Numbers are shown as integers (e.g., 12345), decimal fractions (e.g., 1234.5), or in scientific notation (e.g., 1.23E+10) if the number exceeds 11 digits.
Number	A number with or without the 1000 separator (e.g., a comma) and with any number of decimal places. Negative numbers can be displayed with parentheses and/or red.
Currency	A number with the 1,000 separator and an optional dollar sign (which is placed immediately to the left of the number). Negative values are preceded by a minus sign or are displayed with parentheses or in red. Two decimal places display by default.
Accounting	A number with the 1,000 separator, an optional dollar sign (at the left border of the cell, vertically aligned within a column), negative values in parentheses, and zero values as hyphens. Two decimal places display by default.
Date	The date in different ways, such as March 14, 2012; 3/14/12; or 14-Mar-12.
Time	The time in different formats, such as 10:50 PM or 22:50 (24-hour time).

(*Continued*)

TABLE 5 (*Continued*)	
Format Style	**Display**
Percentage	The value as it would be multiplied by 100 (for display purpose), with the percent sign. The default number of decimal places is zero if you click Percent Style in the Number group or two decimal places if you use the Format Cells dialog box. However, you should typically increase the number of decimal points to show greater accuracy.
Fraction	A number as a fraction; appropriate when no exact decimal equivalent exists. A fraction is entered into a cell as a formula such as =1/3. If the cell is not formatted as a fraction, you will see the results of the formula.
Scientific	A number as a decimal fraction followed by a whole number exponent of 10; for example, the number 12345 would appear as 1.23E+04. The exponent, +04 in the example, is the number of places the decimal point is moved to the left (or right if the exponent is negative). Very small numbers have negative exponents.
Text	The data left-aligned; is useful for numerical values that have leading zeros and should be treated as text, such as postal codes or phone numbers. Apply Text format before typing a leading zero so that the zero displays in the cell.
Special	A number with editing characters, such as hyphens in a Social Insurance Number.
Custom	Predefined customized number formats or special symbols to create your own customized number format.

The Number group on the Home tab contains commands for applying Accounting Number Format, Percent Style, and Comma Style numbering formats. You can click the Accounting Number Format arrow and select other denominations, such as English pounds or euros. For other number formats, click the Number Format arrow and select the numbering format you want to use. For more specific numbering formats than those provided, select More Number Formats from the Number Format menu or click the Number Dialog Box Launcher to open the Format Cells dialog box with the Number tab options readily available. Figure 36 shows different number formats applied to values. The first six values are displayed with two decimal places.

	A	B	C
1	General	1234.56	
2	Number	1234.56	
3	Currency	$1,234.56	
4	Accounting	$ 1,234.56	
5	Comma	1,234.56	
6	Percent	12.34%	
7	Short Date	3/1/2012	
8	Long Date	Thursday, March 01, 2012	

FIGURE 36 Number Formats ➤

Increase and Decrease Decimal Places

After applying a number format, you may need to adjust the number of decimal places that display. For example, if you have an entire column of monetary values formatted in Accounting Number Format, Excel displays two decimal places by default. If the entire column of values contains whole dollar values and no cents, displaying .00 down the column looks cluttered. You can decrease the number of decimal places to show whole numbers only.

To change the number of decimal places displayed, click Increase Decimal in the Number group on the Home tab to display more decimal places for greater precision or Decrease Decimal to display fewer or no decimal places.

4 Formatting

In the first three Hands-On Exercises, you entered data about products on sale, created formulas to calculate markup and profit, and inserted new rows and columns to accommodate additional data. You are ready to format the worksheet. Specifically, you need to centre the title, align text, format values, and apply other formatting to enhance the readability of the worksheet.

Skills covered: Merge and Centre the Title • Wrap and Align Text • Apply Number Formats and Decimal Places • Apply Borders and Fill Colour • Indent Cell Contents

STEP 1 MERGE AND CENTRE THE TITLE

To make the title stand out, you want to centre it over all the data columns. You will use the Merge & Center command to merge cells together and centre the title at the same time. Refer to Figure 37 as you complete Step 1.

	A	B	C	D	E	F	G	H	I
1	OK Office Systems Pricing Information								
2	1-Sep-12								
3									
4	Product	Cost	Markup Ra	Retail Pric	Percent O	Sale Price	Profit Am	Profit Margin	
5	Electronics								
6	Computer System	475.5	0.5	713.25	0.15	606.2625	130.7625	0.215686	
7	28" Monitor	195	0.835	357.825	0.1	322.0425	127.0425	0.39449	
8	Color Laser Printer	457.7	0.755	803.2635	0.2	642.6108	184.9108	0.287749	
9	Furniture								
10	Desk Chair	75	1	150	0.25	112.5	37.5	0.333333	
11	Solid Oak Computer Desk	700	1.857	1999.9	0.3	1399.93	699.93	0.499975	
12									
13									

FIGURE 37 Formatted Title ➤

a. Open the *e01h3markup_LastnameFirstname* workbook if you closed it after the last Hands-On Exercise, and save it as **e01h4markup_LastnameFirstname**, changing *h3* to *h4*.

b. Select the **column B, D, and F headings**. Unhide columns C and E as you learned in Hands-On Exercise 3.

c. Select the **range A1:H1**.

You want to centre the title over all columns of data.

d. Click **Merge & Center** in the Alignment group.

Excel merges cells in the range A1:H1 into one cell and centres the title horizontally within the merged cell, which is cell A1.

TROUBLESHOOTING: If you merge too many or not enough cells, you can unmerge the cells and start again. To unmerge cells, click in the merged cell. The Merge & Center command has an orange border when the active cell is merged. Click Merge & Center to unmerge the cell. Then select the correct range to merge and use Merge & Center again.

FYI

e. Bold the title, and then select **14 pt** size.

f. Select the **range A2:H2**. Merge and centre the date, and then bold it.

g. Save the workbook.

STEP 2 WRAP AND ALIGN TEXT

You will wrap the text in the column headings to avoid columns that are too wide for the data, but which will display the entire text of the column headings. In addition, you will horizontally centre column headings between the left and right cell margins. Refer to Figure 38 as you complete Step 2.

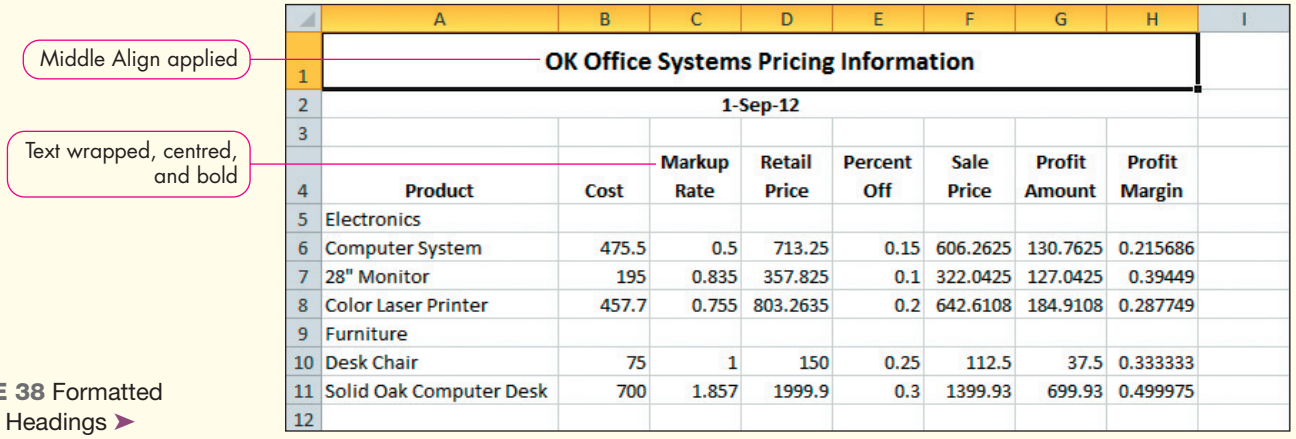


FIGURE 38 Formatted Column Headings ➤

a. Select the **range A4:H4**.

You selected the multiple-word column headings.

b. Click **Wrap Text** in the Alignment group.

The column headings are now visible on two lines within each cell.

c. Click **Center** in the Alignment group. Bold the selected column headings.

The column headings are centred horizontally between the left and right edges of each cell.

d. Click **cell A1**, which contains the title.

e. Click **Middle Align** in the Alignment group. Save the workbook.

Middle Align vertically centres data between the top and bottom edges of the cell.

STEP 3 APPLY NUMBER FORMATS AND DECIMAL PLACES

You need to format the values to increase readability and look more professional. You will apply number formats and adjust the number of decimal points displayed. Refer to Figure 39 as you complete Step 3.

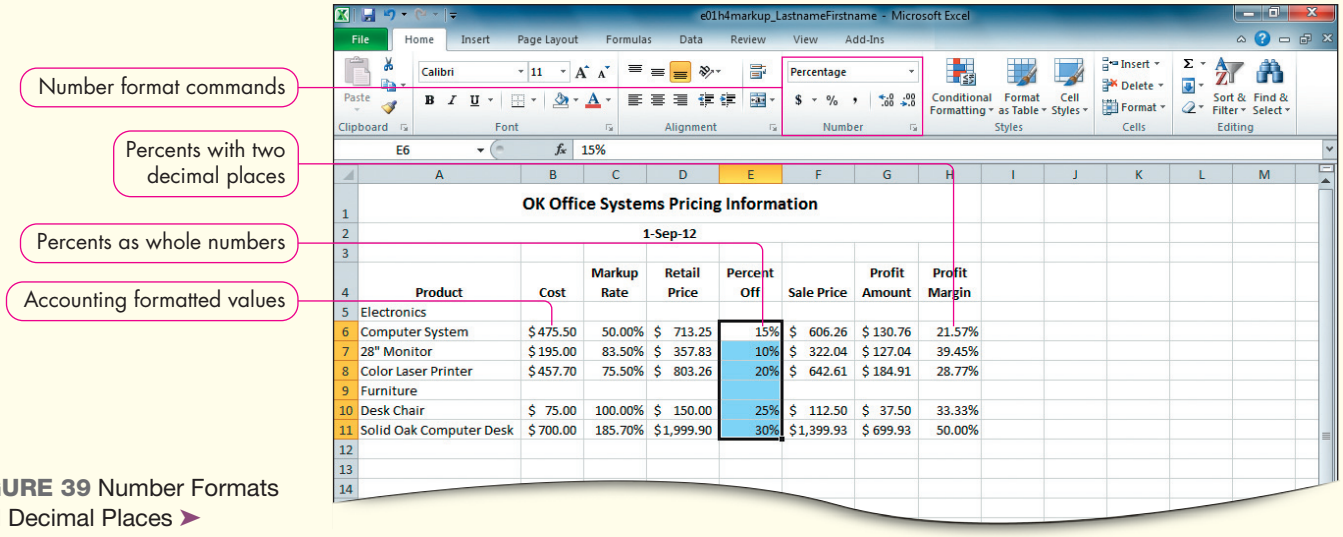


FIGURE 39 Number Formats and Decimal Places ➤

a. Select the **range B6:B11**, and then click **Accounting Number Format** in the Number group.

You formatted the selected range with Accounting Number Format. The dollar signs align on the left cell margins and the decimals align.

b. Select the **range D6:D11**. Press and hold down **Ctrl** as you select the **range F6:G11**.

Since you want to format nonadjacent ranges with the same formats, you hold down Ctrl.

c. Click **Accounting Number Format** in the Number group.

You formatted the selected nonadjacent ranges with the Accounting Number Format.

d. Select the **range C6:C11**, and then click **Percent Style** in the Number group.

You formatted the values in the selected ranges with Percent Style, showing whole numbers only.

e. Click **Increase Decimal** in the Number group twice.

You increased the decimal places to avoid misleading your readers by displaying the values as whole percentages.

FYI

f. Use Format Painter to copy the formats of the selected range to values in columns E and H.

g. Select the **range E6:E11**, and then click **Decrease Decimal** twice in the Number group. Save the workbook.

Since this range contained whole percentages, you do not need to show the decimal places.

STEP 4 APPLY BORDERS AND FILL COLOUR

You want to apply a light purple fill colour to highlight the column headings. In addition, you want to emphasize the percent off and sale prices. You will do this by applying a border around that range. Refer to Figure 40 as you complete Step 4.

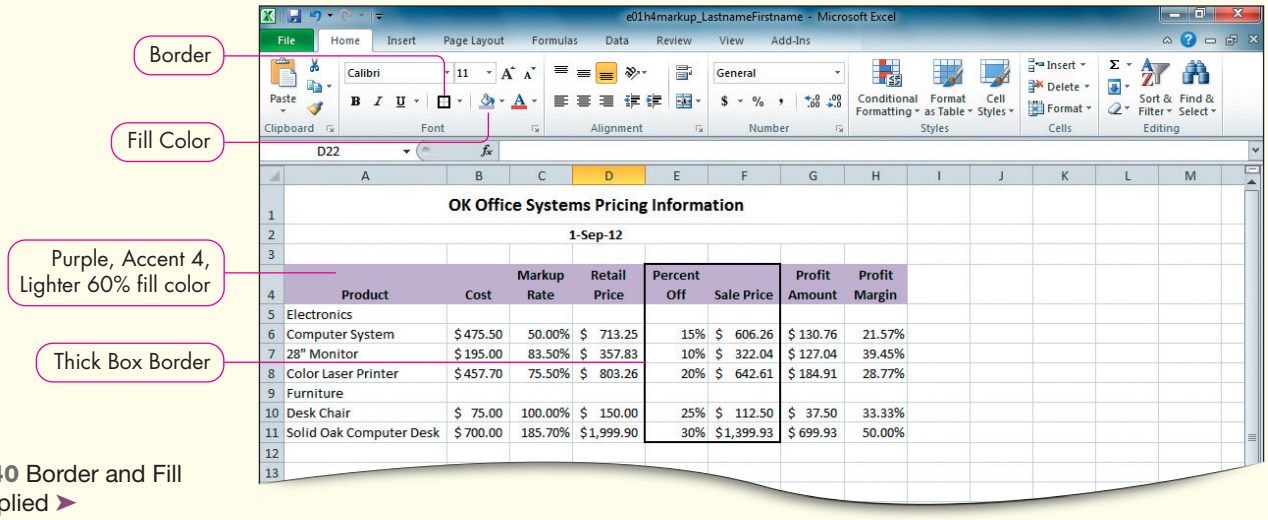


FIGURE 40 Border and Fill Colour Applied ➤

a. Select the **range A4:H4**.

b. Click the **Fill Color arrow** in the Font group.

c. Click **Purple, Accent 4, Lighter 60%** in the *Theme Colors* section. It is the third colour down in the third column from the right.

You applied a fill colour to the selected cells to draw attention to these cells.

d. Select the **range E4:F11**.

e. Click the **Border arrow** in the Font group, and then select **Thick Box Border**.

You applied a border around the selected cells.

f. Click in an empty cell below the columns of data to deselect the cells. Save the workbook.

STEP 5 INDENT CELL CONTENTS

As you review the first column, you notice that the category names, Electronics and Furniture, don't stand out. You decide to indent the labels within each category to show which products are in each category. Refer to Figure 41 as you complete Step 5.

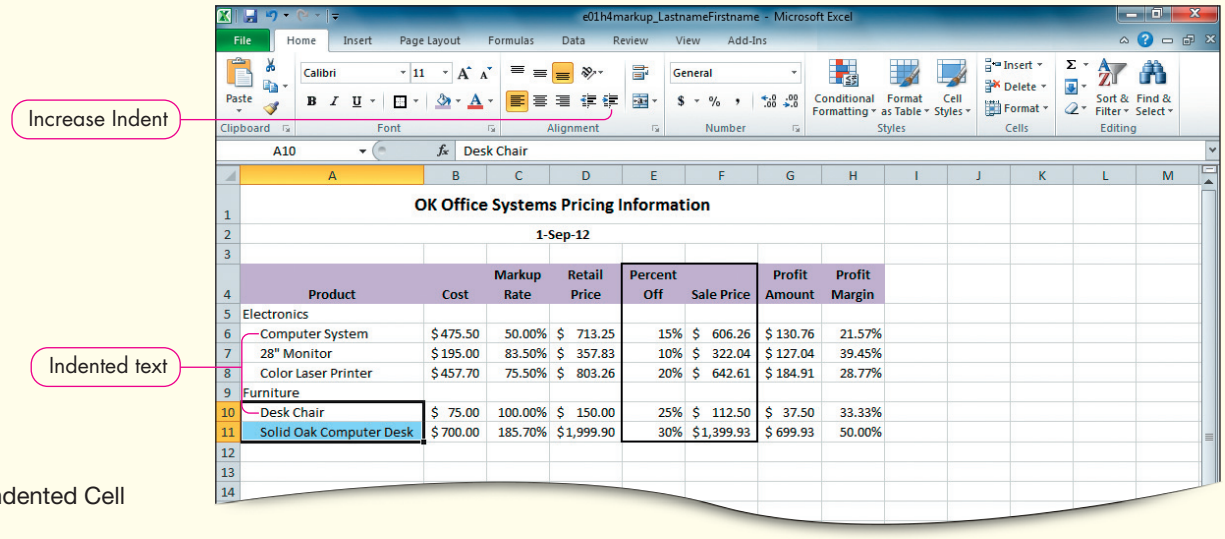


FIGURE 41 Indented Cell Contents ➤

a. Select the **range A6:A8**, the cells containing electronic products.

b. Click **Increase Indent** in the Alignment group twice.

The three selected product names are indented below the Electronics heading.

c. Select the **range A10:A11**, the cells containing furniture products, and then click **Increase Indent** twice.

The two selected product names are indented below the Furniture heading. Notice that the product names appear cut off.

d. Increase the **column A** width to **26.00**.

e. Save the workbook. Keep the workbook onscreen if you plan to continue with Hands-On Exercise 5. If not, close the workbook, and exit Excel.

Page Setup and Printing

Although you might distribute workbooks electronically as e-mail attachments or you might upload workbooks to a corporation server, you should prepare the worksheets in the workbook for printing. You should prepare worksheets in case you need to print them or in case others who receive an electronic copy of your workbook need to print the worksheets. The Page Layout tab provides options for controlling the printed worksheet (see Figure 42).

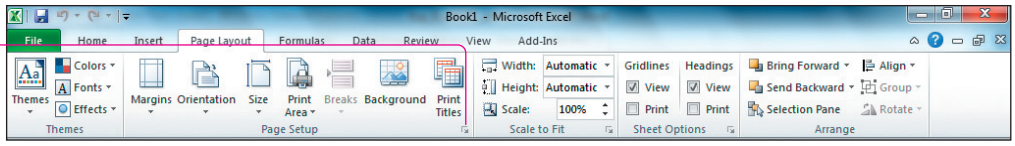


FIGURE 42 Page Layout Tab ➤

In this section, you will select options on the Page Layout tab. Specifically, you will use the Page Setup, Scale to Fit, and Sheet Options groups. After selecting page setup options, you are ready to print your worksheet.

Selecting Page Setup Options

The Page Setup group on the Page Layout tab contains options to set the margins, select orientation, specify page size, select the print area, and apply other options. The Scale to Fit group contains options for adjusting the scaling of the spreadsheet on the printed page. When possible, use the commands in these groups to apply page settings. Table 6 lists and describes the commands in the Page Setup group.

TABLE 6 Page Setup Commands

Command	Description
Margins	Displays a menu to select predefined margin settings. The default margins are 1.9 cm (0.75") top and bottom and 1.8 cm (0.7") left and right. You will often change these margin settings to balance the worksheet data better on the printed page. If you need different margins, select Custom Margins.
Orientation	Displays orientation options. The default page orientation is portrait, which is appropriate for worksheets that contain more rows than columns. Select landscape orientation when worksheets contain more columns than can fit in portrait orientation. For example, the OKOS worksheet might appear better balanced in landscape orientation because it has eight columns.
Size	Displays a list of standard paper sizes. The default size is 21.59 cm by 27.94 cm (8.5" by 11"). If you have a different paper size, such as legal paper, select it from the list.
Print Area	Displays a list to set or clear the print area. When you have very large worksheets, you might want to print only a portion of that worksheet. To do so, select the range you want to print, click Print Area in the Page Setup group, and select Set Print Area. When you use the Print commands, only the range you specified will be printed. To clear the print area, click Print Area, and select Clear Print Area.
Breaks	Displays a list to insert or remove page breaks.
Background	Enables you to select an image to appear as the background behind the worksheet data when viewed onscreen (backgrounds do not appear when the worksheet is printed).
Print Titles	Enables you to select column headings and row labels to repeat on multiple-page printouts.

Specify Page Options

To apply several page setup options at once or to access options not found on the Ribbon, click the Page Setup Dialog Box Launcher. The Page Setup dialog box organizes options into four tabs: Page, Margins, Header/Footer, and Sheet. All tabs contain Print and Print Preview buttons. Figure 43 shows the Page tab.

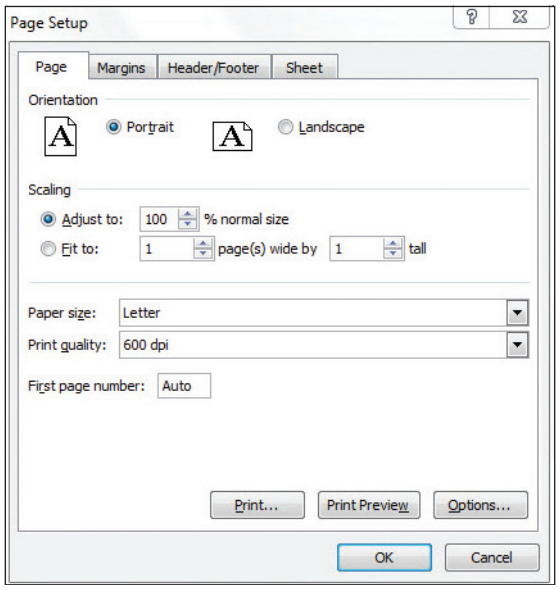


FIGURE 43 Page Setup Dialog Box Page Tab ➤

The Page tab contains options to select the orientation and paper size. In addition, it contains scaling options that are similar to the options in the Scale to Fit group on the Page Layout tab. You use scaling options to increase or decrease the size of characters on a printed page, similar to using a zoom setting on a photocopy machine. You can also use the Fit to option to force the data to print on a specified number of pages.

Specify Margins Options

The Margins tab (see Figure 44) contains options for setting the specific margins. In addition, it contains options to centre the worksheet data horizontally or vertically on the page. To balance worksheet data equally between the left and right margins, Excel users often centre the page horizontally.

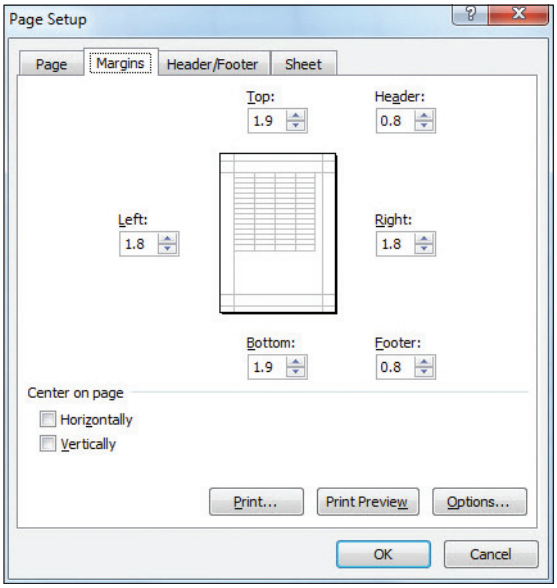


FIGURE 44 Page Setup Dialog Box Margins Tab ➤

Create Headers and Footers

The Header/Footer tab (see Figure 45) lets you create a header and/or footer that appear at the top and/or bottom of every printed page. Click the arrows to choose from several preformatted entries, or alternatively, you can click Custom Header or Custom Footer, insert text and other objects, and then click the appropriate formatting button to customize your headers and footers. You can use headers and footers to provide additional information about the worksheet. You can include your name, the date the worksheet was prepared, and page numbers, for example.

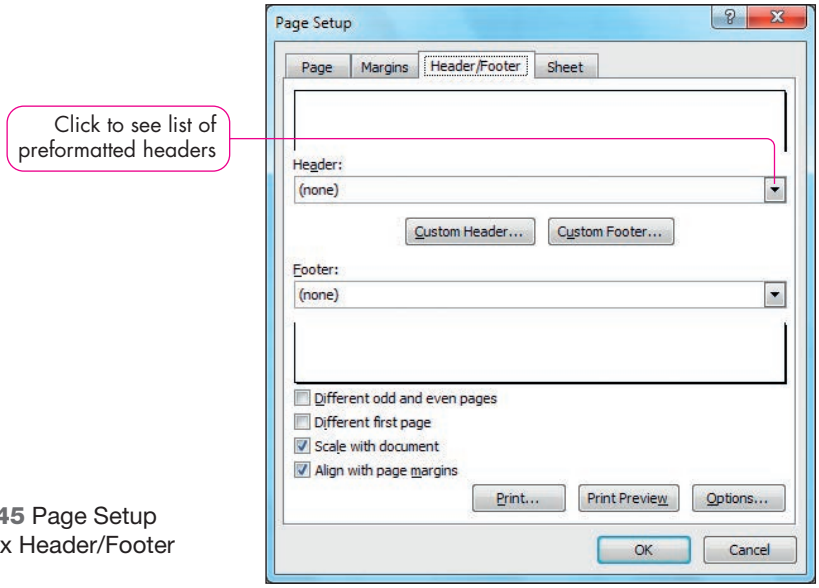


FIGURE 45 Page Setup Dialog Box Header/Footer Tab ➤

Instead of creating headers and footers using the Page Setup dialog box, you can click the Insert tab and click Header & Footer in the Text group. Excel displays the worksheet in Page Layout view with the insertion point in the centre area of the header. If you click the View tab and then click Page Layout, you see an area that displays *Click to add header* at the top of the worksheet. You can click inside the left, centre, or right section of a header or footer. When you do, Excel displays the Header & Footer Tools Design contextual tab (see Figure 46). You can enter text or insert data from the Header & Footer Elements group on the tab. To get back to Normal view, click any cell in the worksheet, and then click Normal in the Workbook Views group on the View tab.

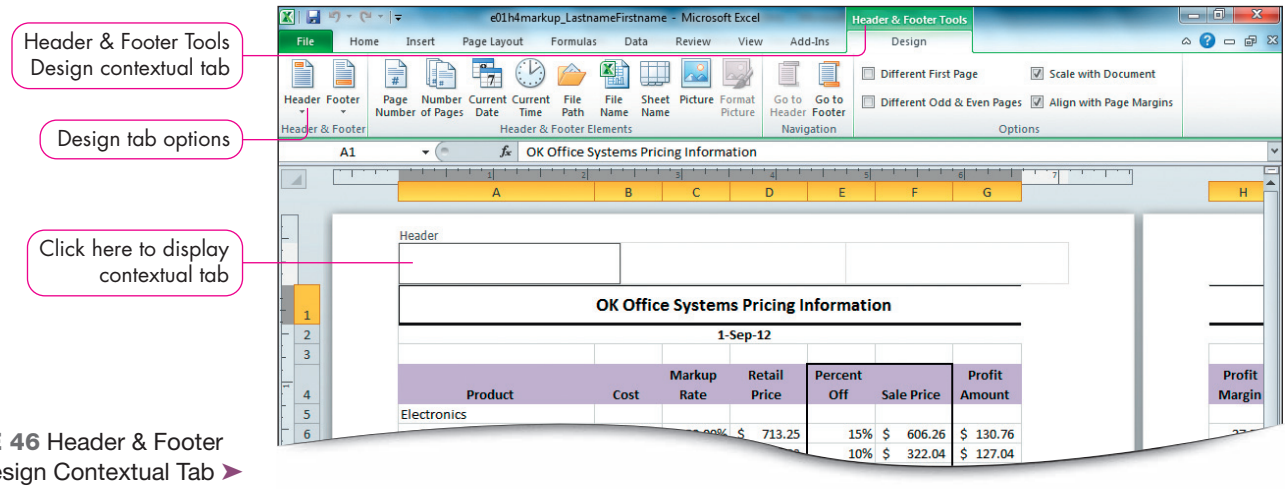


FIGURE 46 Header & Footer Tools Design Contextual Tab ➤

Select Sheet Options

The Sheet tab (see Figure 47) contains options for setting the print area, print titles, print options, and page order. Some of these options are also located in the Sheet Options group on the Page Layout tab on the Ribbon. By default, Excel displays gridlines onscreen to show you each cell's margins, but the gridlines do not print unless you specifically select the Gridlines check box in the Page Setup dialog box or the Print Gridlines check box in the Sheet Options group on the Page Layout tab. In addition, Excel displays row (1, 2, 3, etc.) and column (A, B, C, etc.) headings onscreen. However, these headings do not print unless you click the Row and column headings check box in the Page Setup dialog box or click the Print Headings check box in the Sheet Options group on the Page Layout tab.

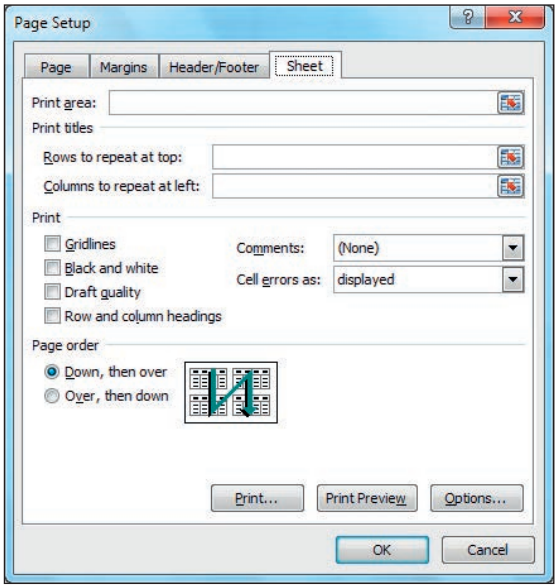


FIGURE 47 Page Setup Dialog Box Sheet Tab ➤

TIP Printing Gridlines and Headings

For most worksheets, you do not need to print gridlines and row/column headings. However, when you want to display and print cell formulas instead of formula results, you might want to print the gridlines and row/column headings. Doing so will help you analyze your formulas. The gridlines help you see the cell boundaries, and the headings help you know what data are in each cell. At times, you might want to display gridlines to separate data on a regular printout to increase readability.

Printing a Worksheet

Before printing a worksheet, you should click the File tab and then select Print. The Backstage view displays print options and displays the worksheet in print preview mode. This mode helps you see in advance if the data are balanced on the page or if data will print on multiple pages. The bottom of the Backstage view indicates how many total pages will print. If the settings are correct, you can specify the print options. If you do not like how the worksheet will print, click the Page Layout tab so that you can adjust margins, scaling, column widths, and so on until the worksheet data appear the way you want them to print.

The Backstage view helps you see in advance if the data are balanced on the page.

5 Page Setup and Printing

You are ready to complete the OKOS worksheet. Before printing the worksheet for your supervisor, you want to make sure the data will appear professional when printed. You will adjust some page setup options to put the finishing touches on the worksheet.

Skills covered: Set Page Orientation • Set Margin Options • Create a Header • Print Preview and Print • Adjust Scaling and Set Sheet Options

STEP 1 SET PAGE ORIENTATION

Because the worksheet has several columns, you decide to print it in landscape orientation.

a. Open the *e01h4markup_LastnameFirstname* workbook if you closed it after the last Hands-On Exercise, and save it as **e01h5markup_LastnameFirstname**, changing *h4* to *h5*.

b. Click the **Page Layout tab**.

c. Click **Orientation** in the Page Setup group.

d. Select **Landscape** from the list. Save the workbook.

If you print the worksheet, the data will print in landscape orientation.

STEP 2 SET MARGIN OPTIONS

You want to set a 1" (2.54 cm) top margin and centre the data between the left and right margins.

a. Click **Margins** in the Page Setup group on the Page Layout tab.

As you review the list of options, you notice the list does not contain an option to centre the worksheet data horizontally.

b. Select **Custom Margins**.

The Page Setup dialog box opens with the Margins tab options displayed.

c. Click the **Top spin box** to display *1*.

You set a 1" (2.54 cm) top margin. You don't need to change the left and right margins since you will centre the worksheet data horizontally between the original margins.

d. Click the **Horizontally check box** in the *Center on page* section, and then click **OK**. Save the workbook.

The worksheet data will be centred between the left and right margins.

STEP 3 CREATE A HEADER

To document the worksheet, you want to include your name, the current date, and the worksheet tab name in a header. Refer to Figure 48 as you complete Step 3.

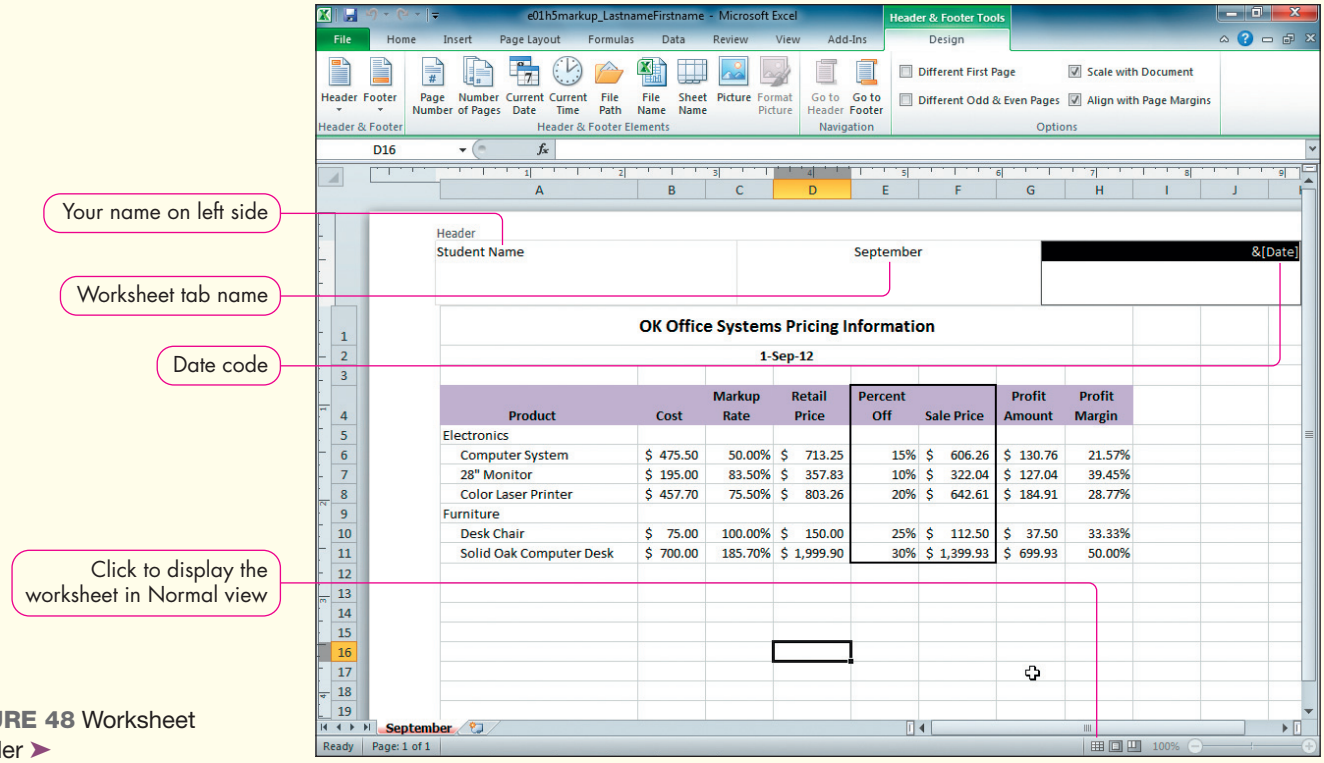


FIGURE 48 Worksheet Header ➤

a. Click the **Insert tab**, and then click **Header & Footer** in the Text group.

Excel displays the Header & Footer Tools Design tab, and the worksheet displays in Page Layout view. The insertion point blinks inside the centre section of the Header.

b. Click in the left section of the header, and then type your name.

c. Click in the centre section of the header, and then click **Sheet Name** in the Header & Footer Elements group on the Design tab.

Excel inserts the code &[Tab]. This code displays the name of the worksheet. If you change the worksheet tab name, the header will reflect the new sheet name.

d. Click in the right section of the header, and then click **Current Date** in the Header & Footer Elements group on the Design tab.

Excel inserts the code &[Date]. This code displays the current date based on the computer clock when you print the worksheet. If you want a specific date to appear regardless of the date you open or print the worksheet, you would have to type that date manually. When you click in a different header section, the codes, such as &[Tab], display the actual tab name instead of the code.

e. Click in any cell in the worksheet, click **Normal** on the status bar, and then save the workbook.

STEP 4 PRINT PREVIEW AND PRINT

Before printing the worksheet, you should print preview it. Doing so helps you detect margin problems and other issues, such as a single row or column of data flowing onto a new page. Refer to Figure 49 as you complete Step 4.

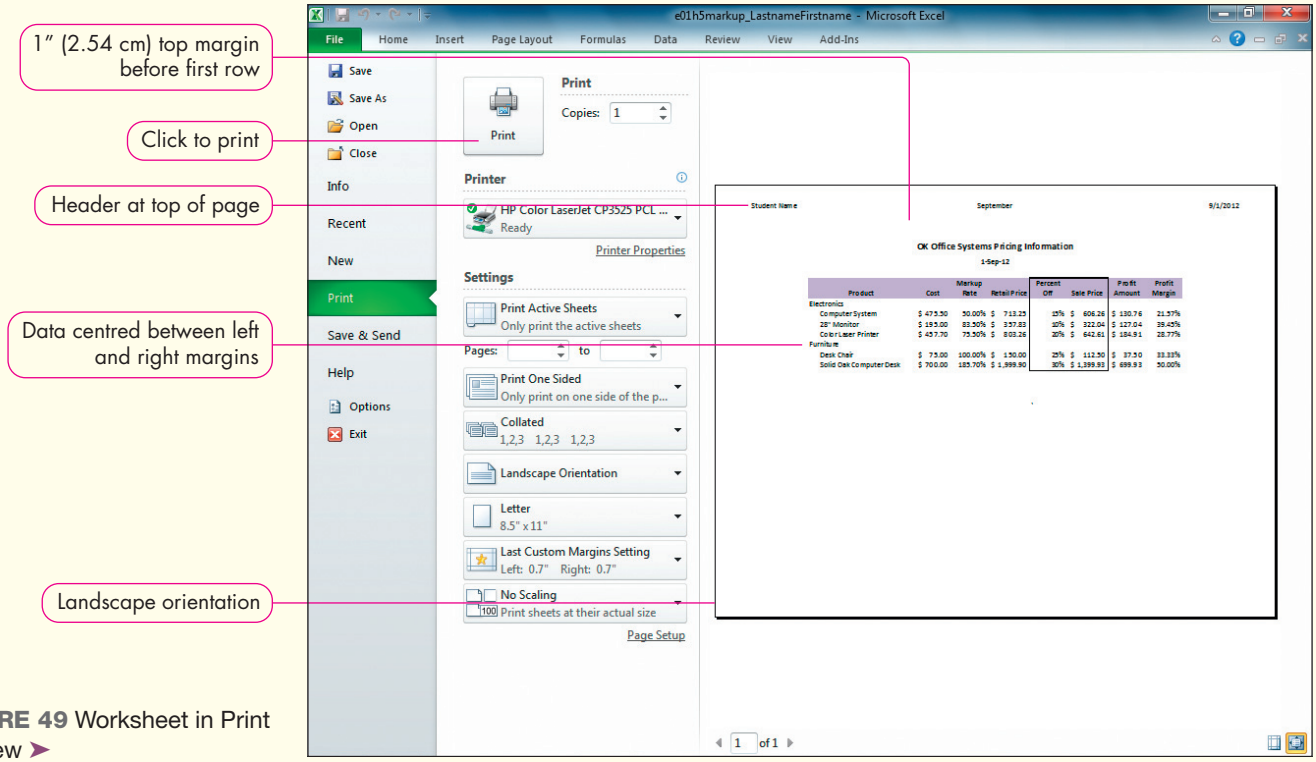


FIGURE 49 Worksheet in Print Preview ➤

a. Click the **File tab**, and then click **Print**.

The Backstage view displays print options and a preview of the worksheet.

b. Verify the Printer name displays the printer that you want to use to print your worksheet.

c. Click **Print** to print the worksheet, and then save the workbook.

Check your printed worksheet to make sure the data are formatted correctly. After you click Print, the Home tab is displayed. If you decide not to print at this time, you need to click the Home tab yourself.

STEP 5 ADJUST SCALING AND SET SHEET OPTIONS

You want to print a copy of the worksheet formulas to check the logic of the formulas. You need to display the formulas, select options to print gridlines and headings, and then decrease the scaling so that the data print on one page. Refer to Figure 50 as you complete Step 5.

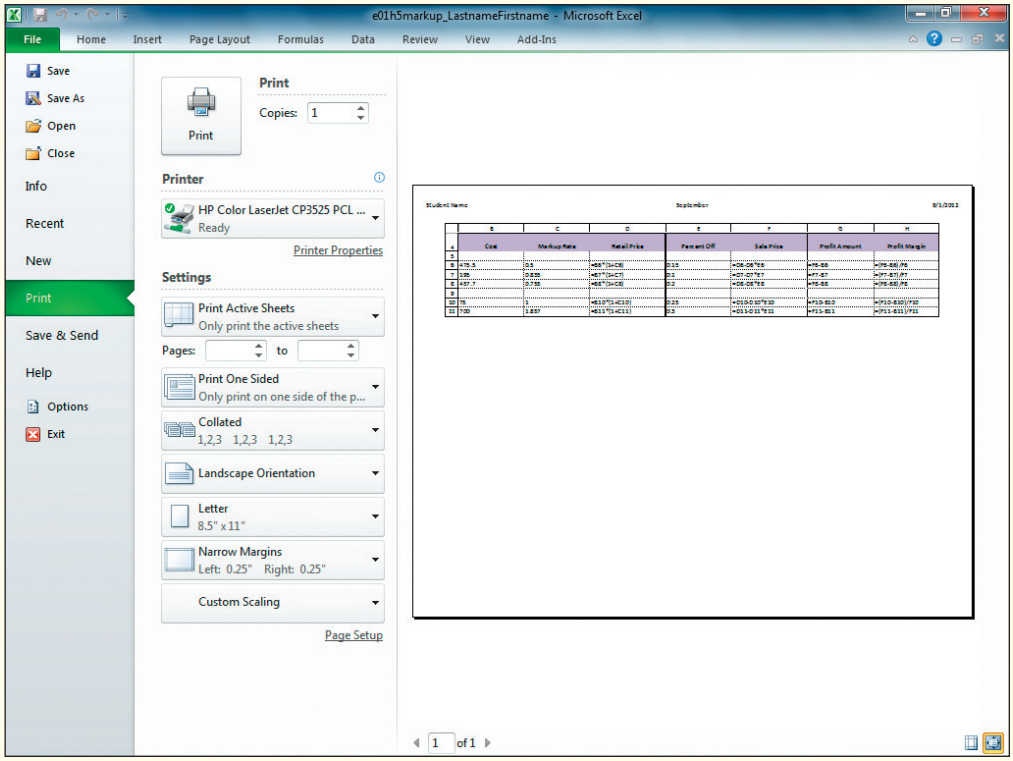


FIGURE 50 Worksheet in Print Preview ➤

a. Press **Ctrl**+` to display cell formulas.

b. Click the **Page Layout tab**. Click the **Print Gridlines check box**, and then click the **Print Headings check box** in the Sheet Options group.

Since you want to print cell formulas, it is helpful to display the gridlines and row and column headings on that printout.

c. Click the **File tab**, and then click **Print**.

The bottom of the Backstage view displays *1 of 2*, indicating the worksheet no longer prints on one page.

d. Click **Next Page** (the right triangle at the bottom of the Backstage view), and then click the **Page Layout tab**.

e. Click **Margins** in the Page Setup group, and then select **Narrow**.

f. Select the **range B4:H11**, click **Print Area** in the Page Setup group, and then select **Set Print Area**.

g. Click the **Scale spin box** in the Scale to Fit group on the Page Layout tab until it displays **90%**.

The dotted line indicating the page break now appears on the right side of the last column, indicating that the worksheet data will print on one page. If you want to verify that the worksheet will print on one page, display it in print preview.

h. Print the worksheet. Save and close the *e01h5markup_LastnameFirstname* workbook and submit the worksheet based on your instructor's directions.

Check your printed worksheet to make sure the data are formatted correctly.

CHAPTER OBJECTIVES REVIEW

After reading this chapter, you have accomplished the following objectives:

1. **Plan for effective workbook and worksheet design.** Planning before entering data helps ensure better worksheet design. Planning involves stating the purpose, identifying input values, determining outputs, and deciding what data to add into columns and rows.
2. **Explore the Excel window.** Excel shares many common elements with other Office programs, but also includes unique elements. The Name Box identifies the location of the active cell, indicated first by column letter and then by row number, for example, A10. The Formula Bar displays the contents of the current cell. Select All enables users to select all items in the worksheet. Column and row headings identify column letters and row numbers. Sheet tabs provide different worksheets within the workbook. Navigation buttons enable users to navigate among worksheet tabs.
3. **Enter and edit cell data.** You can enter text, values, dates, and formulas in cells. Text aligns on the left cell margin, and values and dates align on the right cell margin. Values represent quantities that can be used in calculations. Dates may be entered in a variety of formats. You can edit or clear the contents of cells.
4. **Use symbols and order of precedence.** The basic arithmetic symbols are +, −, *, /, and ^ in Excel. The order of operations is the sequence in which mathematical operations is performed: parentheses, exponents, multiplication, division, addition, and subtraction. Formulas start with an equal sign, should include cell references containing values, and should not contain raw values except constants.
5. **Use Auto Fill.** To copy a formula down a column or across a row, double-click or drag the fill handle. You can use Auto Fill to copy formulas, number patterns, names of months, weekdays, etc.
6. **Display cell formulas.** By default, the results of formulas appear in cells instead of the actual formulas. You can display formulas within the cells to help troubleshoot formulas by pressing Ctrl+`.
7. **Manage worksheets.** The default worksheet tab names are Sheet1, Sheet2, and Sheet3. You can rename the worksheet tabs to be more meaningful, delete extra worksheets, insert new worksheets, and apply colours to worksheet tabs. In addition, you can move worksheets or copy worksheets.
8. **Manage columns and rows.** Although you should plan a worksheet before creating it, you can insert new columns and rows or delete columns and rows that you no longer need. You can also increase or decrease the height or width of rows and columns to display data better. Hiding rows and columns protects confidential data from being displayed or printed.
9. **Select, move, copy, and paste.** A range may be a single cell or a rectangular block of cells. After selecting a range, you can cut it to move it to another range or copy it to another location in the worksheet. You should ensure the designation range contains enough empty cells to accommodate the data you cut or copied to avoid overwriting existing data. The Paste Special option enables you to specify how the data are pasted into the worksheet.
10. **Apply alignment and font options.** You can apply horizontal and vertical alignment to format data in cells or use Merge & Center to combine cells and centre titles over columns of data. To indicate hierarchy of data or to offset a label you can increase or decrease how much the data are indented in a cell. Use the Wrap Text option to present text on multiple lines in order to avoid having extra-wide columns. You can further improve readability of worksheets by adding appropriate borders around important ranges or applying fill colours to cells.
11. **Apply number formats.** The default number format is General, which does not apply any particular format to values. Apply appropriate formats to values to present the data with the correct symbols and decimal alignment. For example, Accounting is a common number format for monetary values. Other popular number formats include Percentage and Date. After applying a number format, you can increase or decrease the number of decimal points displayed.
12. **Select page setup options.** The Page Layout tab on the Ribbon contains options for setting margins, selecting orientation, specifying page size, selecting the print area, and applying other settings. In addition, you can display the Page Setup dialog box to specify these and other settings to control how data will print. You can insert a header or footer to display documentation, such as your name, date, time, and worksheet tab name.
13. **Print a worksheet.** Before printing a worksheet, you should display a preview in the Backstage view to ensure the data will print correctly. The Backstage view helps you see if margins are correct or if isolated rows or columns will print on separate pages. After making appropriate adjustments, you can print the worksheet.

KEY TERMS

Active cell
Auto Fill
Border
Cell
Cell address
Column width
Fill colour
Fill handle
Formula
Formula Bar
Horizontal alignment
Input area
Name Box
Nonadjacent range
Order of precedence
Output area
Range
Row height
Sheet tab
Spreadsheet
Spreadsheet program
Text
Value
Vertical alignment
Workbook
Worksheet
Wrap text

MULTIPLE CHOICE

1. What is the first step in planning an effective worksheet?
   (a) Enter labels, values, and formulas.
   (b) State the purpose of the worksheet.
   (c) Identify the input and output areas.
   (d) Decide how to format the worksheet data.

2. What Excel interface item is not displayed until you start typing or editing data in a cell?
   (a) Insert Function
   (b) Name Box
   (c) Formula Bar
   (d) Enter

3. Given the formula =B1*B2+B3/B4^2 where B1 contains 3, B2 contains 4, B3 contains 32, and B4 contains 4, what is the result?
   (a) 14
   (b) 121
   (c) 76
   (d) 9216

4. Why would you press Ctrl+` in Excel?
   (a) To display the print options
   (b) To undo a mistake you made
   (c) To display cell formulas
   (d) To enable the AutoComplete feature

5. Which of the following is a nonadjacent range?
   (a) C15:D30
   (b) L15:L65
   (c) A1:Z99
   (d) A1:A10, D1:D10

6. If you want to balance a title over several columns, what do you do?
   (a) Enter the data in the cell that is about midway across the spreadsheet.
   (b) Merge and centre the data over all columns.
   (c) Use the Increase Indent command until the title looks balanced.
   (d) Click Center to centre the title horizontally over several columns.

7. Which of the following characteristics is not applicable to the Accounting Number Format?
   (a) Dollar sign immediately on the left side of the value
   (b) Commas to separate thousands
   (c) Two decimal places
   (d) Zero values displayed as hyphens

8. If you want to see a preview of how a worksheet will appear on a hard copy, what do you do?
   (a) Change the Zoom to 100%.
   (b) Click the Page Layout tab, and then click the Print check box in the Sheet Options group.
   (c) Click the File tab, and then click Print.
   (d) Click the Page Setup Dialog Box Launcher.

9. Assume that the data on a worksheet consume a whole printed page and a couple of columns on a second page. You can do all of the following except what to force the data to print all on one page?
   (a) Decrease the Scale value.
   (b) Increase the left and right margins.
   (c) Decrease column widths if possible.
   (d) Select a smaller range as the print area.

10. What should you do if you see a column of pound signs (###) instead of values or results of formulas?
    (a) Increase the zoom percentage.
    (b) Delete the column.
    (c) Adjust the row height.
    (d) Increase the column width.

PRACTICE EXERCISES

1 Mathematics Review

After a nice summer break, you want to brush up on your math skills. Since you are learning Excel, you decide to test your logic by creating formulas in Excel. Your first step is to plan the spreadsheet design. After having read this chapter, you realize that you should avoid values in formulas most of the time. Therefore, you will create an input area that contains values you will use in your formulas. To test your knowledge of formulas, you need to create an output area that will contain a variety of formulas using cell references from the input area. You need to include a formatted title, the date prepared, and your name. After creating and verifying formula results, you plan to change the input values and observe changes in the formula results. After verifying the results, you will copy the data to Sheet2, display cell formulas, and apply page layout options. This exercise follows the same set of skills as used in Hands-On Exercises 1, 2, 3, and 5 in the chapter. Refer to Figure 51 as you complete this exercise.

	A	B	C	D	E
1	**Excel Formulas and Order of Precedence**				
2	Date Created:	9/1/2012		Student Name	
3					
4	**Input Area:**			**Output Area:**	
5	First Value	1		Sum of 1st and 2nd values	3
6	Second Value	2		Difference between 4th and 1st values	3
7	Third Value	3		Product of 2nd and 3rd values	6
8	Fourth Value	4		Quotient of 3rd and 1st values	3
9				2nd value to the power of 3rd value	8
10				1st value added to product of 2nd and 4th values and difference between sum and 3rd value	6
11				Product of sum of 1st and 2nd and difference between 4th and 3rd values	3
12				Product of 1st and 2nd added to product of 3rd and 4th values	14
13					

FIGURE 51 Formula Practice ➤

a. Start Excel. If Excel is already open, click the **File tab**, select **New**, and then click **Create** to display a blank workbook. Save the workbook as **e01p1math_LastnameFirstname**.

b. Type **Excel Formulas and Order of Precedence** in **cell A1**, and then press **Enter**.

c. Type the labels in **cells A2** through **A8** as shown in Figure 51, type the current date in **cell B2** in the format shown, and then type the values shown in **cells B5:B8**. Column A labels will appear cut off after you enter values in column B, and the column B values will be right-aligned at this point.

d. Type your name in **cell D2**, and then type the labels in **cells D4:D12** as shown in Figure 51. Column D labels will overlap into columns E through L at this point.

e. Adjust the column widths by doing the following:
   - Click in any cell in column A, and then click **Format** in the Cells group.
   - Select **Column Width**, type **12.5** in the **Column width box**, and then click **OK**.
   - Use the instructions in the first two bullets above to set a **35.5** width for **column D**.
   - Use the instructions in the first two bullets above to set a **11.43** width for **column B**.

f. Format the title:
   - Select the **range A1:E1**.
   - Click **Merge & Center** in the Alignment group.
   - Bold the title and apply **14 pt** size.

g. Apply the following font and alignment formats:
   - Bold **cells A4** and **D4**.
   - Select the **range B5:B8**, and then click **Center** in the Alignment group.
   - Select the **range D10:D12**, and then click **Wrap Text** in the Alignment group.

h. Enter the following formulas in **column E**:
   - Click **cell E5**. Type **=B5+B6** and press **Enter**. Excel adds the value stored in cell B5 (1) to the value stored in cell B6 (2). The result (3) appears in cell E5, as described in cell D5. You can check your results with the results shown in Figure 51.
   - Enter appropriate formulas in **cells E6:E8**, pressing **Enter** after entering each formula. Subtract to calculate a difference, multiply to calculate a product, and divide to calculate a quotient.
   - Type **=B6^B7** in **cell E9**, and then press **Enter**. Estimate the answer: 2*2*2 = 8.
   - Enter **=B5+B6*B8-B7** in **cell E10**, and then press **Enter**. Estimate the answer: 2*4 = 8; 1+8 = 9; 9-3 = 6. Multiplication occurs first, followed by addition, and finally subtraction.
   - Enter **=(B5+B6)*(B8-B7)** in **cell E11**, and then press **Enter**. Estimate the answer: 1+2 = 3; 4-3 = 1; 3*1 = 3. Notice that this formula is almost identical to the previous formula; however, the parentheses affect the order of operations. Calculations in parentheses occur before the multiplication.
   - Enter **=B5*B6+B7*B8** in **cell E12**, and then press **Enter**. Estimate the answer: 1*2 = 2; 3*4 = 12; 2+12 = 14.

i. Edit a formula and the input values:
   - Click **cell E12**, and then click in the **Formula Bar** to edit the formula. Add parentheses as shown: **=(B5*B6)+(B7*B8)**, and then click **Enter** to the left side of the Formula Bar. The answer is still 14. The parentheses do not affect order of precedence since multiplication occurred before the addition. The parentheses help improve the readability of the formula.
   - Click **cell B5**, type **2**, and then press **Enter**. Type **4**, press **Enter**, type **6**, press **Enter**, type **8**, and then press **Enter**.
   - Double-check the results of the formulas using a calculator or your head. The new results in cells E5:E12 should be 6, 6, 24, 3, 4096, 28, 12, and 56, respectively.

j. Double-click the **Sheet1 tab**, type **Results**, and then press **Enter**. Right-click the **Results tab**, select **Move or Copy**, click **(move to end)** in the *Before sheet* section, click the **Create a copy check box**, and then click **OK**. Double-click the **Results (2) tab**, type **Formulas**, and then press **Enter**. Right-click the **Sheet2 tab**, and then select **Delete**. Delete the Sheet3 tab.

k. Make sure the Formulas worksheet tab is active, click the **Page Layout tab**, and then do the following:
   - Click **Orientation** in the Page Setup group, and then select **Landscape**.
   - Click the **Print Gridlines check box**, and then click the **Print Headings check box** in the Sheet Options group.

l. Click the **Formulas tab**, and then click **Show Formulas** in the Formula Auditing group. Double-click between the column A and column B headings to adjust the column A width. Double-click between the column B and column C headings to adjust the column B width. Set **24.0** width for **column D**.

m. Click the **File tab**, and then click **Print**. Verify that the worksheet will print on one page. Click the **File tab** again to close the Backstage view.

n. Save and close the workbook, and submit the worksheet based on your instructor's directions.

2 Calendar Formatting

You want to create a calendar for October. The calendar will enable you to practise alignment settings, including centre, merge and centre, and indents. In addition, you will need to adjust column widths and increase row height to create cells large enough to enter important information, such as birthdays, in your calendar. You will use Auto Fill to complete the days of the week and the days within each week. To improve the appearance of the calendar, you will add fill colours, font colours, borders, and clip art. This exercise follows the same set of skills as used in Hands-On Exercises 1–5 in the chapter. Refer to Figure 52 as you complete this exercise.

FIGURE 52 October Calendar Page ➤

a. Click the **File tab**, select **New**, and then click **Create** to display a blank workbook. Save the workbook as **e01p2october_LastnameFirstname**.

b. Type **October** in **cell A1**, and then click **Enter** on the left side of the Formula Bar.

c. Format the title:
   - Select the **range A1:G1**, and then click **Merge & Center** in the Alignment group.
   - Apply **48 pt** size.
   - Click the **Fill Color arrow**, and then click **Orange, Accent 6** on the top row of the *Theme Colors* section of the colour palette.

d. Complete the days of the week:
   - Type **Sunday** in **cell A2**, and then click **Enter** on the left side of the Formula Bar.
   - Drag the fill handle in **cell A2** across the row through **cell G2** to use Auto Fill to complete the rest of the weekdays.
   - Click the **Fill Color arrow**, and then select **Orange, Accent 6, Lighter 80%**. Click the **Font Color arrow**, and then click **Orange, Accent 6**. Apply bold and **14 pt** size. Click **Middle Align**, and then click **Center** in the Alignment group.

e. Complete the days of the month:
   - Type **1** in **cell B3**, press **Tab**, type **2** in **cell C3**, and then click **Enter** on the left side of the Formula Bar.
   - Select the **range B3:C3**. Drag the fill handle in **cell C3** across the row through **cell G3** to use Auto Fill to complete the rest of the days for the first week.
   - Type **7** in **cell A4**, press **Tab**, type **8** in **cell B4**, and then click **Enter** on the left side of the Formula Bar. Use the fill handle to complete the days for the second week.
   - Type **14** in **cell A5**, press **Tab**, type **15** in **cell B5**, and then click **Enter** on the left side of the Formula Bar. Use the fill handle to complete the days for the third week.
   - Use the fill handle to complete the days of the month (up to 31).

f. Format the columns and rows:
   - Select **columns A:G**. Click **Format** in the Cells group, select **Column Width**, type **16** in the **Column width box**, and then click **OK**.
   - Select **row 2**. Click **Format** in the Cells group, select **Row Height**, type **54**, and then click **OK**.
   - Select **rows 3:7**. Set an **80** row height.
   - Select the **range A2:G7**. Click the **Borders arrow** in the Font group, and then select **All Borders**.
   - Select the **range A3:G7**. Click **Top Align** and **Align Text Left** in the Alignment group. Click **Increase Indent**. Bold the numbers and apply **12 pt** size.

FYI

g. Insert and size images:
   - Display the Clip Art task pane. Search for and insert the Halloween image in the **October 31 cell**. Size the image to fit within the cell.
   - Search for and insert the Thanksgiving image in the **October 8 cell**. Size the image to fit within the cell.

h. Double-click **Sheet1**, type **October**, and then press **Enter**. Right-click **Sheet2**, and then select **Delete**. Delete Sheet3.

i. Click the **Page Layout tab**. Click **Orientation** in the Page Setup group, and then select **Landscape**.

j. Click the **Insert tab**, and then click **Header & Footer** in the Text group. Click in the left side of the header, and then type your name. Click in the centre of the header, and then click **Sheet Name** in the Header & Footer Elements group on the Design tab. Click in the right side of the header, and then click **File Name** in the Header & Footer Elements group on the Design tab. Click in any cell in the workbook, and then click **Normal** on the status bar.

k. Save and close the workbook, and submit based on your instructor's directions.

3 Elementary School Attendance

As the principal of Wellsville Elementary School, you have to prepare periodic reports about student attendance. You decided to create a spreadsheet in Excel to store data by each grade level for a particular day. You will complete your spreadsheet by entering formulas to calculate the percentages of students who were present and absent each day. You also want to format the spreadsheet to present the data effectively. This exercise follows the same set of skills as used in Hands-On Exercises 1–5 in the chapter. Refer to Figure 53 as you complete this exercise.

	A	B	C	D	E	F
1	**Wellsville Elementary**					
2	**Monday, April 30, 2012**					
3						
4	**Grade Level**	**Total Students**	**Number Present**	**Attendance Rate**	**Absence Rate**	
5	Pre-K	15	10	66.67%	33.33%	
6	Kindergarten	35	30	85.71%	14.29%	
7	Grade 1	50	41	82.00%	18.00%	
8	Grade 2	45	44	97.78%	2.22%	
9	Grade 3	47	46	97.87%	2.13%	
10	Grade 4	38	38	100.00%	0.00%	
11	Grade 5	42	40	95.24%	4.76%	
12						

FIGURE 53 Attendance Report ➤

a. Open the *e01p3attend* workbook and save it as **e01p3attend_LastnameFirstname** so that you can return to the original workbook if necessary.

b. Adjust alignments by doing the following from the Alignment group on the Home tab:
   - Select the **range A1:F1**, and then click **Merge & Center** in the Alignment group to centre the title over the data columns. Merge and centre the date in the second row over the data columns.
   - Select the **range A4:F4**. Click **Wrap Text**, and then click **Center** in the Alignment group to centre and word-wrap the column headings.

c. Click **cell D4**. Click the **Delete arrow** in the Cells group, and then select **Delete Sheet Columns** to delete the empty column D.

d. Move the Pre-K row above the Kindergarten row by doing the following:
   - Right-click the **row 5 heading**, and then select **Insert** from the shortcut menu to insert a new row.
   - Select the **range A12:E12**. Cut the selected range, click **cell A5**, and then paste.

e. Select the **range A5:E11**. Click **Format** in the Cells group, and then select **Row Height**. Type **24** and click **OK** to increase the row height.

f. Calculate the percentages of students who were present and absent today by doing the following:
   - Click **cell D5**. Type **=C5/B5** and press **Tab** to enter the formula and make **cell E5** the active cell. This formula divides the number of students present by the total number of students in Pre-K.
   - Type **=(B5-C5)/B5** and click **Enter** on the left side of the Formula Bar to enter the formula and keep **cell E5** as the active cell. This formula must first calculate the number of students who were absent by subtracting the number of students present from the total number of students in Pre-K. The difference is divided by the total number of students to determine the percentage of students absent.
   - Select the **range D5:E5**. Click **Percent Style** in the Number group, and then click **Increase Decimal** twice in the Number group. With both cells still selected, double-click the fill handle in the bottom-right corner of **cell E5** to copy the formulas down the columns.
   - Click the **Formulas tab**, and then click **Show Formulas** in the Formula Auditing group to display cell formulas. Review the formulas, and then click **Show Formulas** to display formula results again.

FYI

g. Press **Ctrl+Home** to make **cell A1** the active cell. Spell-check the worksheet and make necessary changes.

h. Click the **Page Layout tab**. Click **Margins** in the Page Setup group, select **Custom Margins**, click the **Horizontally check box**, and then click **OK**.

i. Click the **Insert tab**. Click **Header & Footer** in the Text group. Click in the left side of the header, and then type your name. Press **Tab**, and then click **Current Date** in the Header & Footer Elements group. Press **Tab**, and then click **File Name** in the Header & Footer Elements group. Click **cell A1**, and then click **Normal** on the status bar.

j. Save and close the workbook, and submit based on your instructor's directions.

MID-LEVEL EXERCISES

1 Fuel Efficiency

Your summer vacation involved travelling through several provinces to visit relatives and to view the scenic attractions. While travelling, you kept a travel log of mileage and gasoline purchases. Now that the vacation is over, you want to determine the fuel efficiency of your car. The partially completed worksheet includes the beginning mileage for the vacation trips and the amount of fuel purchased.

a. Open the *e01m1fuel* workbook and save the workbook as **e01m1fuel_LastnameFirstname** so that you can return to the original workbook if necessary.
b. Insert a new column between columns B and C, and then type **Kilometres Driven** as the column heading.
c. Select the range of beginning kilometres in **cells A5:A12**. Copy the selected range to duplicate the values in **cells B4:B11** to ensure that the ending mileage for one trip is identical to the beginning mileage for the next trip.
d. Create the formula to calculate the kilometres driven for the first trip. Copy the formula down the **Kilometres Driven column**.
e. Create the formula to calculate the kilometres per litre for the first trip. Copy the formula down the **Kilometres Per Litre column**.
f. Merge and centre the title over the data columns. Apply bold, **16 pt** size, and **Blue, Accent 1** font colour.
g. Format the column headings: bold, centred, wrap text, and **Blue, Accent 1, Lighter 80% fill color**.
h. Apply **Comma Style** to the values in the Beginning and Ending columns, and then display these values as whole numbers. Display the values in the Kilometres Per Litre column with two decimal places.
i. Delete Sheet2 and Sheet3. Rename *Sheet1* as **Mileage**.
j. Set these page settings: 5 cm (**2"**) top margin, centred horizontally, **125%** scaling.
k. Insert a header with your name on the left side, the sheet name code in the centre, and the file name code on the right side.
l. Save and close the workbook, and submit based on your instructor's directions.

2 Guest House Rental Rates

You manage a beach guest house in Muskoka, Ontario. The guest house contains three types of rental units. You set prices based on peak and off-peak times of the year. You want to calculate the maximum daily revenue for each rental type, assuming all units of each type are rented. In addition, you want to calculate the discount rate for off-peak rental times. After calculating the revenue and discount rate, you want to improve the appearance of the worksheet by applying font, alignment, and number formats. Refer to Figure 54 as you complete this exercise.

	A	B	C	D	E	F	G
1	**Beachfront Guest House**						
2	Effective May 1, 2012						
3							
4			Peak Rentals		Off-Peak Rentals		
5	**Rental Type**	**No. Units**	**Per Day**	**Maximum Revenue**	**Per Day**	**Maximum Revenue**	**Discount Rate**
6	Studio Apartment	6	$ 149.95	$ 899.70	$ 112.50	$ 675.00	25.0%
7	1 Bedroom Suite	4	$ 250.45	$ 1,001.80	$ 174.00	$ 696.00	30.5%
8	2 Bedroom Suite	2	$ 450.00	$ 900.00	$ 247.55	$ 495.10	45.0%

FIGURE 54 Beachfront Guest House Rental Summary ➤

a. Open the *e01m2rentals* workbook and save the workbook as **e01m2rentals_LastnameFirstname** so that you can return to the original workbook if necessary.

b. Create and copy the following formulas:
   - Calculate the Peak Rentals Maximum Revenue based on the number of units and the rental price per day.
   - Calculate the Off-Peak Rentals Maximum Revenue based on the number of units and the rental price per day.
   - Calculate the discount rate for the Off-Peak rental price per day. For example, using the peak and off-peak per day values, the studio apartment rents for 75% of its peak rental rate. However, you need to calculate and display the off-peak discount rate, which is 25%.

DISCOVER

c. Format the monetary values with **Accounting Number Format**. Format the discount rate in **Percent Style** with one decimal place.

d. Format the headings on row 4:
   - Merge and centre *Peak Rentals* over the two columns of peak rental data. Apply bold, **Dark Red fill color** and **White, Background 1 font color**.
   - Merge and centre *Off-Peak Rentals* over the three columns of off-peak rental data. Apply bold, **Blue fill color**, and **White, Background 1 font color**.

e. Centre, bold, and wrap the headings on row 5.

f. Apply **Red**, **Accent 2**, **Lighter 80% fill color** to the **range C5:D8**. Apply **Blue**, **Accent 1**, **Lighter 80% fill color** to the **range E5:G8**.

g. Set 2.54 cm (**1″**) top, bottom, left, and right margins. Centre the data horizontally on the page.

h. Insert a header with your name on the left side, the sheet name code in the centre, and the file name code on the right side.

i. Insert a new worksheet, and then name it **Formulas**. Copy the data from the Rental Rates worksheet to the Formulas worksheet. On the Formulas worksheet, select **landscape orientation** and the options to print gridlines and headings. Display cell formulas and adjust column widths so that the data will fit on one page. Insert a header with the same specifications that you did for the Rental Rates worksheet.

j. Save and close the workbook, and submit based on your instructor's directions.

3 Real Estate Sales Report

You own a small real estate company in Ajax, Ontario. You want to analyze sales for selected properties. Your assistant prepared a spreadsheet with some of the data from the files. You need to calculate the number of days that the houses were on the market and their sales percentage of the list price. In one situation, the house was involved in a bidding war between two families that really wanted the house. Therefore, the sale price exceeded the list price.

a. Open the *e01m3sales* workbook and save the workbook as **e01m3sales_LastnameFirstname** so that you can return to the original workbook if necessary.

b. Delete the row that has incomplete sales data. The owners took their house off the market.

c. Calculate the number of days each house was on the market. Copy the formula down that column.

d. Calculate the sale price percentage of the list price. The second house was listed for $500,250, but it sold for only $400,125. Therefore, the sale percentage of the list price is 79.99%. Format the percentages with two decimal places.

e. Format prices with **Accounting Number Format** with zero decimal places.

f. Wrap the headings on row 4.

g. Insert a new column between the Date Sold and List Price columns. Move the Days on Market column to the new location. Then delete the empty column B.

h. Edit the list date of the 41 Chestnut Circle house to be **4/20/2012**. Edit the list price of the house on Amsterdam Drive to be **$355,000**.

i. Select the **property rows**, and then set a **20** row height. Adjust column widths as necessary.

j. Select **landscape orientation**, and then set the scaling to **130%**. Centre the data horizontally and vertically on the page.

k. Insert a header with your name, the current date code, and the current time code.

l. Save and close the workbook, and submit based on your instructor's directions.

CAPSTONE EXERCISE

myitlab grader

You manage a publishing company that publishes and sells books to bookstores in Guelph, Ontario. Your assistant prepared a standard six-month royalty statement for one author. You need to insert formulas, format the worksheets, and then prepare royalty statements for other authors.

Enter Data into the Worksheet

You need to enter and format a title, enter the date indicating the end of the statement period, and then delete a blank column. You also need to insert a row for the standard discount rate row, a percentage that you discount the books from the retail price to sell to the bookstores.

a. Open the *e01c1royal* workbook and save it as **e01c1royal_LastnameFirstname**.

b. Type **Royalty Statement** in **cell A1**. Merge and centre the title over the four data columns. Select **16 pt** size, and apply **Purple font color**.

c. Type **6/30/2012** in **cell B3**, and then left-align the date.

d. Delete the blank column between the Hardback and Paperback columns.

e. Insert a new row between *Retail Price* and *Price to Bookstore*. Enter **Standard Discount Rate**, **0.55**, and **0.5**. Format the two values as **Percent Style**.

Calculate Values

You need to insert formulas to perform necessary calculations.

a. Enter the **Percent Returned formula** in the Hardback column. The percent returned indicates the percentage of books sold but returned to the publisher.

b. Enter the **Price to Bookstore formula**. This is the price at which you sell the books to the bookstore and is based on the retail price and the standard discount. For example, if a book has a $10 retail price and a 55% discount, you sell the book for $4.50.

c. Enter the **Net Retail Sales formula**. The net retail sales is the revenue from the net units sold at the retail price. Gross units sold minus the returned units equals net units sold.

d. Enter the **Royalty to Author formula**. Royalties are based on net retail sales and the applicable royalty rate.

e. Enter the **Royalty per Book formula**. This amount is the author's earnings on every book sold but not returned.

f. Copy the formulas to the Paperback column.

Format the Values

You are ready to format the values to improve the readability.

a. Apply **Comma Style** with zero decimal places to the quantities in the *Units Sold* section.

b. Apply **Percent Style** with one decimal place to the Units Sold values, **Percent Style** with zero decimal places to the Pricing values, and **Percent Style** with two decimal places to the Royalty Information values.

c. Apply **Accounting Number Format** to all monetary values.

Format the Worksheet

You want to improve the appearance of the rest of the worksheet.

a. Select the **Hardback** and **Paperback labels**. Apply bold, right-alignment, and **Purple font color**.

b. Select the **Units Sold section heading**. Apply bold and **Purple, Accent 4, Lighter 40% fill color**.

c. Use **Format Painter** to apply the formats from the Units Sold label to the Pricing and Royalty Information labels.

d. Select the individual labels within each section (e.g., *Gross Units Sold*) and indent the labels twice. Widen column A as needed.

e. Select the **range A7:C10** (the *Units Sold* section), and then apply the **Outside Borders border style**. Apply the same border style to the *Pricing* and *Royalty Information* sections.

Manage the Workbook

You want to duplicate the royalty statement worksheet to use as a model to prepare a royalty statement for another author. You will apply page setup options and insert a header on both worksheets.

a. Insert a new worksheet on the right side of the Jacobs worksheet. Rename the worksheet as **Lopez**.

b. Change the Jacobs sheet tab to **Red**. Change the Lopez sheet tab to **Dark Blue**.

c. Copy Jacobs' data to the Lopez worksheet.

d. Make these changes on the Lopez worksheet: **Lopez** (author), **5000** (hardback gross units), **15000** (paperback gross units), **400** (hardback returns), **175** (paperback returns), **19.95** (hardback retail price), and **7.95** (paperback retail price).

e. Click the **Jacobs sheet tab**, and then press and hold down **Ctrl** as you click the **Lopez sheet tab** to select both worksheets. Select the margin setting to centre the data horizontally on the page. Insert a header with your name on the left side, the sheet name code in the centre, and the file name code on the right side.

f. Change back to Normal view. Right-click the **Jacobs sheet name**, and then select **Ungroup Sheets**.

Display Formulas and Print the Workbook

You want to print the formatted Jacobs worksheet to display the calculated results. To provide evidence of the formulas, you want to display and print cell formulas in the Lopez worksheet.

a. Display the cell formulas for the Lopez worksheet.

b. Select options to print the gridlines and headings.

c. Adjust the column widths so that the formula printout will print on one page.

d. Submit either a hard copy of both worksheets or an electronic copy of the workbook to your professor as instructed. Close the workbook.

BEYOND THE CLASSROOM

Server's Tip Distribution

GENERAL CASE

You are a server at a restaurant in Ottawa. When you get tips, you calculate the percentage of the subtotal to determine your performance based on the tip. You must tip the bartender 15% of the drink amount and the server assistant 12% of your total tip amount. You started to design a spreadsheet to enter data for one shift. Open *e01b1tips* and save it as **e01b1tips_LastnameFirstname**. Now you need to insert columns for the bartender and assistant tip rates, perform calculations, and format the data. After entering the formulas, use Auto Fill to copy the formulas down the respective columns. Include a notes section that explains the tipping rates for the bartender and server assistant. Decide where to place this information. Add and format a descriptive title, date, and time of shift. To format the data, apply concepts learned in the chapter: font, borders, fill colour, alignment, wrap text, and number formats. Select appropriate options on the Page Layout tab. Copy the data to Sheet2, display cell formulas, print gridlines, print headings, set the print area to the column headings and data, and adjust the column widths. Include a footer with appropriate data for the two worksheets. Manage the workbook by deleting extra worksheets, renaming the two worksheets that contain data, and adding worksheet tab colours to both sheets. Save and close the workbook, and submit based on your instructor's directions.

Credit Card Rebate

RESEARCH CASE

You recently found out the personal-use Costco TrueEarnings® American Express credit card earns annual rebates on all purchases, whether at Costco or other places. You want to see how much rebate you would have received had you used this credit card for purchases in the past year. Use the Internet to research the percentage rebates for different categories. Plan the design of the spreadsheet. Enter the categories, rebate percentages, amount of money you spent in each category, and a formula to calculate the amount of rebate. Use the Excel Help feature to learn how to add several cells using a function instead of adding cells individually and how to apply a Double Accounting underline. Then insert the appropriate function to total your categorical purchases and rebate amounts. Apply appropriate formatting and page setup options as discussed in this chapter for readability. Underline the last monetary values for the last data row, and apply the Double Accounting underline style to the totals. Insert a header with imperative documentation. Save the workbook as **e01b2rebate_LastnameFirstname**. Save and close the workbook, and submit based on your instructor's directions.

Housing Estimates

DISASTER RECOVERY

One of your friends is starting a home construction business. Your friend developed an Excel workbook to prepare a cost estimate for a potential client. However, the workbook contains several errors. You offer to review the workbook, identify the errors, and correct them. Open *e01b3house* and save it as **e01b3house_LastnameFirstname**. Research how to insert comments in cells. As you identify the errors, insert comments in the respective cells to explain the errors. Correct the errors. Insert your name on the left side of the header. The other header and page setup options are already set. Save and close the workbook, and submit based on your instructor's directions.