Microsoft Excel 2010/2013 Training Book LEVEL 2

Lesson 4: Using Basic Formulas

LESSON SKILL MATRIX 90
Key Terms 90
Software Orientation 91
Understanding and Displaying Formulas 92
Understanding Order of Operations 93
Building Basic Formulas 94
- Creating a Formula that Performs Addition 95
- Creating a Formula that Performs Subtraction 95
- Creating a Formula that Performs Multiplication 96
- Creating a Formula that Performs Division 96

Using Cell References in Formulas 97
- Using Relative Cell References in a Formula 97
- Using Absolute Cell References in a Formula 98

Workplace Ready: Absolute Cell References for Payroll Tracking 99
- Using Mixed Cell References in a Formula 100
- Using External Cell References 101

Using Cell Ranges in Formulas 103
- Naming a Range 103
- Using the New Name dialog box to name a range 104
- Changing the Size of a Range 106
- Creating a Formula that Operates on a Named Range 107
- Keeping Track of Named Ranges 108

Skill Summary 109
- Knowledge Assessment 109
- Competency Assessment 110
- Proficiency Assessment 112
- Mastery Assessment 113

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Lesson 5: Using Functions

LESSON SKILL MATRIX 115

Key Terms **115**

Software Orientation **116**

Exploring Functions **117**

Displaying Dates and Times with Functions **119**
- Exploring Dates **119**
- Using TODAY **120**
- Using NOW **120**

Workplace Ready: Using Dates at Work **121**

Summarizing Data with Functions **121**
- Using the SUM Function **122**
- Using the COUNT Function **123**
- Using the COUNTA Function **123**
- Using the AVERAGE Function **124**
- Using the MIN Function **125**
- Using the MAX Function **125**

Using a Financial Function **126**
- Use PMT **126**

Using Formulas to Create Subtotals **127**
- Selecting and Creating Ranges for Subtotaling **127**
- Building Formulas for Subtotaling **128**
- Modifying Ranges for Subtotaling **129**

Uncovering Formula Errors **130**
- Reviewing Error Messages **131**
- Tracing and Removing Trace Arrows **132**

Displaying and Printing Formulas **133**

Skill Summary 134

- Knowledge Assessment **134**
- Competency Assessment **136**
- Proficiency Assessment **137**
- Mastery Assessment **138**

Circling Back 1 **140**

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Lesson 6: Formatting Cells and Ranges

LESSON SKILL MATRIX 143

Key Terms **143**

Software Orientation **144**

Inserting and Deleting Cells **145**
- Inserting Cells into a Worksheet **145**
- Deleting Cells from a Worksheet **146**

Manually Formatting Cell Contents **147**
- Aligning and Indenting Cell Contents **147**
- Changing Text Orientation **149**
- Choosing Fonts and Font Sizes **150**
- Changing Font Color **151**
- Applying Special Character Attributes **152**
- Filling Cells with Color **153**
- Applying Number Formats **154**
- Wrapping Text in a Cell **157**
- Merging Cells and Splitting Merged Cells **158**
- Placing Borders around Cells **159**

Copying Cell Formatting with the Format Painter **161**

Understanding Paste Special Options **161**

Formatting Cells with Styles **163**
- Applying a Cell Style **163**
- Customizing Cell Styles **164**

Working with Hyperlinked Data **165**
- Inserting a Hyperlink into a Worksheet **165**
- Using a Hyperlink **166**
- Removing a Hyperlink from a Worksheet **166**

Workplace Ready: The Versatility of Hyperlinks **167**

Applying Conditional Formatting to Cells **168**
- Applying a Specific Conditional Format **168**
- Applying Conditional Formatting for Multiple Criteria **169**
- Using the Rules Manager to Apply Conditional Formats **169**

Clearing a Cell's Formatting **171**

Skill Summary 172

- Knowledge Assessment **172**
- Competency Assessment **174**
- Proficiency Assessment **175**
- Mastery Assessment **176**

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Lesson 7: Formatting Worksheets

LESSON SKILL MATRIX 177

Key Terms **177**

Software Orientation **178**

Working with Rows and Columns **179**
- Inserting or Deleting a Row or Column **179**
- Modifying Row Height and Column Width **180**
- Formatting an Entire Row or Column **181**
- Hiding or Unhiding a Row or Column **182**
- Transposing Rows or Columns **184**

Using Themes **185**
- Choosing a Theme for a Workbook **185**
- Customizing a Theme **186**

Workplace Ready: Putting Themes to Work **190**

Modifying a Worksheet's Onscreen and Printed Appearance **190**
- Formatting a Worksheet Background **190**
- Viewing and Printing a Worksheet's Gridlines **191**
- Viewing and Printing Column and Row Headings **192**

Inserting Headers and Footers **193**
- Adding Page Numbers to a Worksheet **193**
- Inserting a Predefined Header or Footer **194**
- Adding Content to a Header or Footer **195**
- Inserting a Watermark **196**
- Repeating Headers and Footers **196**

Preparing a Document for Printing **198**
- Adding and Moving a Page Break **198**
- Setting Margins **199**
- Setting a Worksheet's Orientation **200**
- Scaling a Worksheet to Fit on a Printed Page **201**

Skill Summary 202

- Knowledge Assessment **202**
- Competency Assessment **204**
- Proficiency Assessment **205**
- Mastery Assessment **206**

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4 Using Basic Formulas

LESSON SKILL MATRIX

Skills	Exam Objective	Objective Number
Understanding and Displaying Formulas	Display formulas.	1.4.10
Understanding Order of Operations	Define order of operations.	4.1.2
Building Basic Formulas		
Using Cell References in Formulas	Demonstrate how to use references (relative, mixed, absolute).	4.1.1
Using Cell Ranges in Formulas	Create named ranges.	2.3.4
	Reference cell ranges in formulas.	4.1.3

KEY TERMS

- absolute cell reference
- calculation operator
- cell reference
- constant
- external reference
- formula
- mixed cell reference
- named range
- nested parentheses
- operand
- order of operations
- relative cell reference
- scope
- value
- variable

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When moving to a new rental home, you might need to make some up-front purchases for the new place, such as curtains, storage containers, and a few pieces of furniture. In addition, you have to pay rent each month, which generally is the same amount from one month to another (a recurring expense). Other monthly expenses change depending on usage and seasonal variations, such as electricity, water, and similar services. You can use Excel to track and budget for all of these expenses. In this lesson, you learn about the fundamentals of formulas and the order of operations. You then work on a simple household expenses worksheet, using simple formulas to summarize information from the data in the worksheet. Along the way, you find out how to make any worksheet more flexible by using cell references in formulas and naming cell ranges.

SOFTWARE ORIENTATION

Excel enables you to create many formulas by simply typing in a cell or using your mouse pointer to select cells to include in a formula. For example, you can create basic formulas for addition, subtraction, multiplication, and division using these methods. However, as you have discovered in previous lessons, the user interface offers tools that make it easier to work with data. In this lesson, you use a few command groups on the FORMULAS tab to display formulas and name ranges to be used in formulas.

Use Figure 4-1 as a reference throughout this lesson as you become familiar with some of the command groups on the FORMULAS tab and use them to work with formulas. You learn more about commands on the FORMULAS tab in the next lesson, which addresses functions.

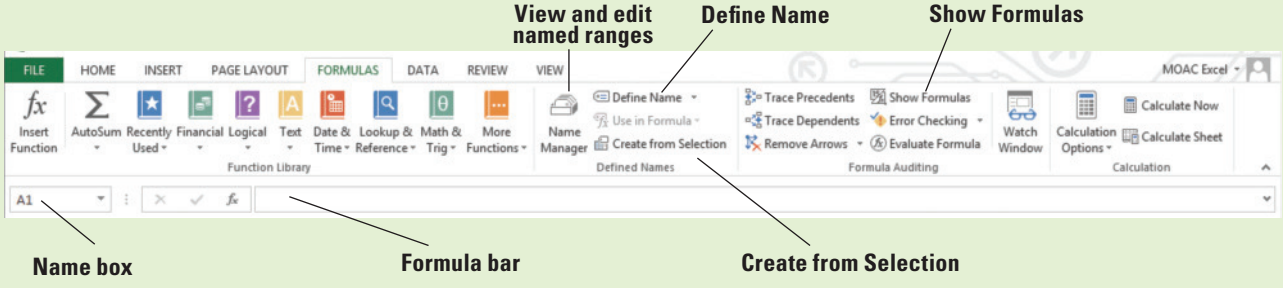


Figure 4-1

The FORMULAS tab in Excel 2013

UNDERSTANDING AND DISPLAYING FORMULAS

Bottom Line

The real strength of Excel is its capability to perform common and complex calculations. The formula is one of the essential elements of Excel, which enables you to add, subtract, multiply, and divide numbers. When you enter a formula in a cell, the formula is stored internally and the results are displayed in the cell. You can view the underlying formula in the formula bar when the cell is active, when you double-click the cell to edit it, and by using the FORMULAS tab.

STEP BY STEP Display Formulas

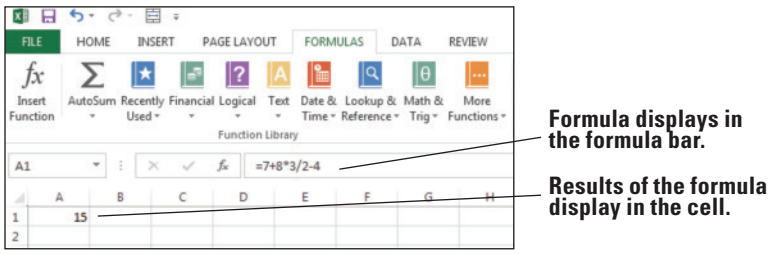
GET READY. Before you begin these steps, LAUNCH Microsoft Excel and OPEN a new blank workbook.

1. Click cell **A1**.
2. Type **=7+8*3/2-4** and press **Enter**. You just entered a formula.

Take Note Formulas should be typed without spaces, but if you type spaces, Excel eliminates them when you press Enter.

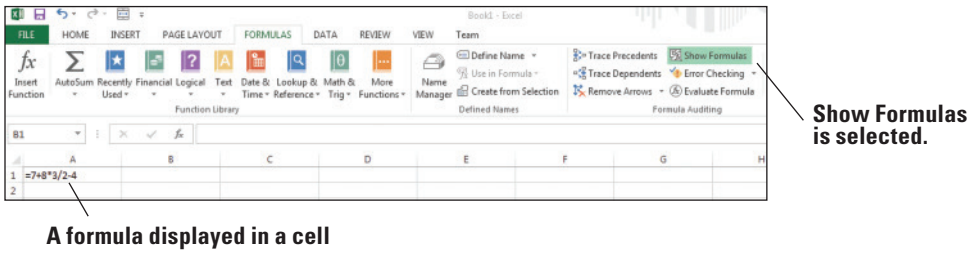
3. Click cell **A1**. Notice that the result of the formula displays in the cell, but the formula itself appears in the formula bar (see Figure 4-2).

Figure 4-2
Viewing a formula in the formula bar



4. Double-click cell **A1**. The formula appears in both the active cell and the formula bar. You can edit the formula in this mode.
5. Press **Enter**.
6. On the FORMULAS tab, in the Formula Auditing group, click **Show Formulas**. The formula in cell A1 displays (see Figure 4-3).

Figure 4-3
Displaying a formula using the Show Formulas command



Take Note While you are displaying formulas, you will not see the results of those formulas.

7. Click **Show Formulas** again to turn off formula display.
8. SAVE the workbook in your Lesson 4 folder as ***04 Formula Practice Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

CERTIFICATION READY? 1.4.10

How do you display a formula in Excel?

A **formula** is an equation that performs calculations, such as addition, subtraction, multiplica-

tion, and division, on values in a worksheet. In Excel, a **value** can be a number, a cell address, a date, text, or Boolean data, but is usually a number or cell address in terms of formulas. A formula consists of two elements: operands and calculation operators. **Operands** identify the values to be used in the calculation. An operand can be a constant value, or a variable such as a cell reference, a range of cells, or another formula. A **constant** is a number or text value that is entered directly into a formula. A **variable** is a symbol or name that represents something else, which can be a cell address, a range of cells, and so on. **Calculation operators** specify the calculations to be performed. To allow Excel to distinguish formulas from data, all formulas begin with an equal sign (=).

Take Note

You can begin a formula with a plus (+) sign or a minus (–) sign as the beginning calculation operator, but Excel changes it to an equal sign when you press Enter. Excel doesn't recognize a construct like 3+4= as a legitimate formula. Excel treats it like an ordinary string of characters.

Excel uses four types of calculation operators: arithmetic, comparison, text concatenation, and reference. This lesson covers several arithmetic operators and the equal sign, which is a comparison operator. The arithmetic operators are listed in Table 4-1.

Table 4-1
Excel Arithmetic Operators

Arithmetic Operator	Name	Calculation	Example
+	Plus sign	Addition	5+2
–	Minus sign	Subtraction	5–2
		Negation	–5
*	Asterisk	Multiplication	5*2
/	Forward slash	Division	5/2
%	Percent sign	Percent	20%
^	Caret	Exponentiation	5^2

When you build a formula, it appears in the formula bar and in the cell itself. When you complete the formula and press Enter, the value displays in the cell and the formula displays in the formula bar if you select the cell. You can edit a formula in the cell or in the formula bar the same way you can edit any data entry.

When you click the Show Formulas button on the FORMULAS tab, all formulas in your worksheet display. Click the Show Formulas button again to toggle off display of formulas.

UNDERSTANDING ORDER OF OPERATIONS

Bottom Line

If you use more than one operator in a formula, Excel follows a specific order—called the **order of operations**—to calculate the formula. Parentheses play an important role in controlling the order of operations.

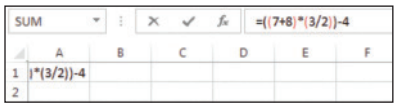
STEP BY STEP **Understand Order of Operations**

GET READY. USE the worksheet from the previous exercise.

1. Click cell A1 to make it the active cell.
2. Click in the formula bar.
3. Insert parentheses around 7 + 8.

4. Insert parentheses around **3 / 2**.
5. Insert parentheses around **(7 + 8) * (3 / 2)**, as shown in the formula bar in Figure 4-4. Press **Enter**. The result in A1 changes to *18.5*.

Figure 4-4
Parentheses added to the formula



6. SAVE the workbook in your Lesson 4 folder as ***04 Order of Operations Solution*** and CLOSE it.

PAUSE. LEAVE Excel open to use in the next exercise.

Excel applies the rules of mathematics to determine how formulas are calculated. The following is the order in which arithmetic operators are applied:

- Negative number (–)
- Percent (%)
- Exponentiation (^)
- Multiplication (*) and division (/) (left to right)
- Addition (+) and subtraction (–) (left to right)

For example, consider the original equation:

7 + 8 * 3 / 2 – 4 = 15

CERTIFICATION READY? 4.1.2

How do you determine the order of operations for arithmetic operators in an Excel formula?

Following arithmetic operator priorities, the first operation is 8 multiplied by 3 and that result is divided by 2. Then 7 is added and 4 is subtracted.

You can use parentheses in a formula to override the standard order of operations. Excel performs calculations on formulas inside parentheses first. Parentheses inside of parentheses are called **nested parentheses**. Calculations are performed on formulas in the innermost set of parentheses first, and from left to right if nested parentheses are at the same level. Therefore, the result of the following equation with parentheses is different from the previous one:

((7 + 8) * (3 / 2)) – 4 = 18.5

Following arithmetic operator priorities, the first operation is the sum of 7 + 8 multiplied by the quotient of 3 divided by 2. Then, 4 is subtracted.

Troubleshooting

While modifying a complex formula, if you decide to revert back to the original formula and start over, just press Esc. If you've already pressed Enter, you'll need to click the Undo button on the Quick Access Toolbar.

BUILDING BASIC FORMULAS

Bottom Line

You do basic math in your head or using scratch paper every day. Excel is handy for performing basic calculations also. Although you probably won't use Excel to add or subtract a few numbers, it's important to learn how to create simple formulas in Excel, which serve as the building blocks for more complex calculations. This section shows you how to create basic formulas that let you perform addition, subtraction, multiplication, and division.

Creating a Formula that Performs Addition

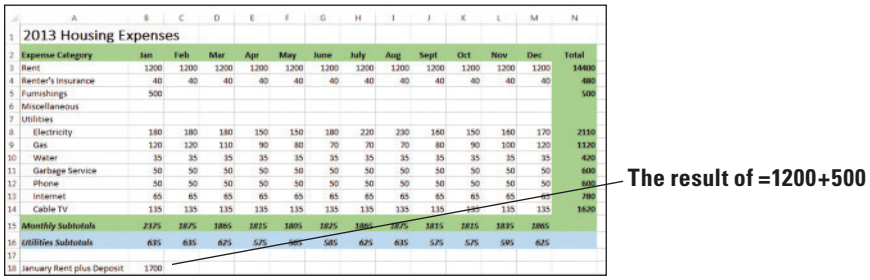
You can add two or more numbers in Excel using the plus sign between each number. To use proper Excel format, you must include the equal sign at the beginning of the formula.

STEP BY STEP — Create a Formula that Performs Addition

GET READY. LAUNCH Microsoft Excel if it is not already open.

1. OPEN the ***04 Budget Start*** data file for this lesson.
2. In cell A18, type **January Rent plus Deposit** and press **Enter**.
3. In cell B18, type the equal (**=**) sign, type **1200+500**, and press **Enter**. This is the simplest way to enter an addition formula. Excel adds the values in the formula and displays the result, *1700*, which is your first month's rent plus a $500 deposit. Your worksheet now looks like that shown in Figure 4-5.

Figure 4-5
The result of an addition formula



4. SAVE the workbook in your Lesson 4 folder as ***04 Budget Basic Formulas Solution.***

PAUSE. LEAVE the workbook open to use in the next exercise.

When entering formulas that perform addition, if a positive number is entered first, it is not necessary to enter a plus sign.

If you make a mistake in your data entry, you can select the cell with the erroneous formula, press F2 to enter cell editing mode, and edit your formula. Once you make your corrections, press Enter to revise.

Creating a Formula that Performs Subtraction

Subtraction works the same way as addition, except that you enter a minus (–) sign rather than a plus (+) sign between the values in the formula.

STEP BY STEP — Create a Formula that Performs Subtraction

GET READY. USE the worksheet you modified in the previous exercise.

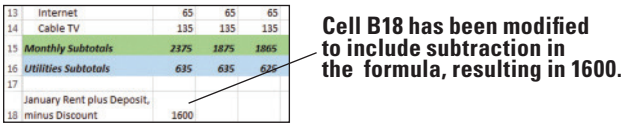
1. Double-click cell **A18**.
2. Click after the word "Deposit," type **, minus Discount**, and press **Enter**.
3. Right-click cell **A18**, select **Format Cells**, click the **Alignment** tab, select the **Wrap text** check box, and click **OK**. Now you can see all of the new text added to A18.

Cross Ref
You learn about different kinds of formatting techniques in Lesson 6.

4. Click cell **B18** to make it the active cell.
5. Click in the formula bar.

6. Position the cursor immediately after **=1200+500**, type **-100**, and press **Enter**. Your landlord gave you a $100 discount for moving into your rental home early, so you are subtracting $100 from your first month's rent. The value in cell B18 changes to *1600* to reflect the new formula (see Figure 4-6).

Figure 4-6
The result of a subtraction formula



7. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

When you modified the formula to subtract 100 from 1700, you could have entered =1200+500–100 or = –100+1200+500. Either formula yields a positive 1600.

Creating a Formula that Performs Multiplication

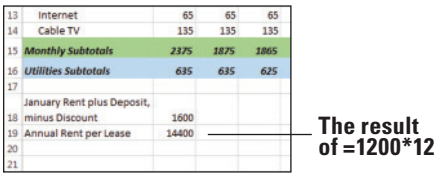
Multiplication not only uses the values in cells, but other numbers that you enter. The symbol for multiplication is the asterisk (*).

STEP BY STEP — Create a Formula that Performs Multiplication

GET READY. USE the worksheet you modified in the previous exercise.

1. In cell A19, type **Annual Rent per Lease** and press **Enter**.
2. In cell B19, type **=1200*12** and press **Enter**. The result displays in cell B19, which is the total amount of rent you will pay in one year (see Figure 4-7).

Figure 4-7
The result of a multiplication formula



3. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Creating a Formula that Performs Division

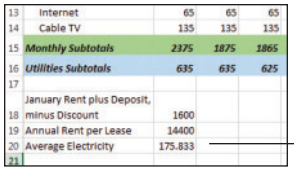
Division works the same way as multiplication, except that the symbol for division is the forward slash (/).

STEP BY STEP — Create a Formula that Performs Division

GET READY. USE the worksheet you modified in the previous exercise.

1. In cell A20, type **Average Electricity** and press **Enter**.
2. In cell B20, type **=N8/12** and press **Enter**. The result displays in cell B20, which is the average monthly amount you will pay for electricity in one year (see Figure 4-8).

Figure 4-8
The result of a division formula



3. SAVE the workbook and CLOSE it.

PAUSE. LEAVE Excel open to use in the next exercise.

USING CELL REFERENCES IN FORMULAS

Bottom Line

As you learned in Lesson 1, "Overview," each cell in an Excel worksheet has a unique identifier indicating its column and row, such as A1 (column A, row 1) or E4 (column E, row 4). When you create a formula, you can reference a cell's identifier rather than typing the number that appears in that cell. A **cell reference** identifies a cell's location in the worksheet, based on its column letter and row number. Using a cell reference rather than the data displayed in a cell gives you more flexibility in your worksheet. If the data in a cell changes, any formulas that reference the cell change as well. For example, if cell E1 contains the number 12 but is later changed to 15, any formula that references cell E1 updates automatically. The same principle applies to a cell that contains a formula and is referenced in another formula.

Using Relative Cell References in a Formula

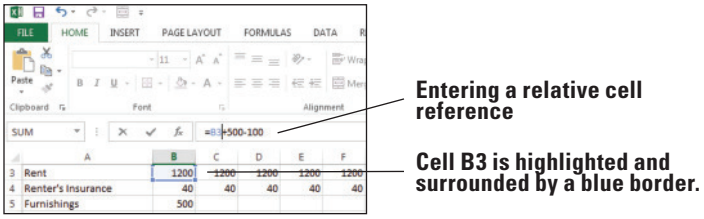
A **relative cell reference** is one that adjusts the cell identifier automatically if you insert or delete columns or rows, or if you copy the formula to another cell. A relative cell reference is, therefore, one whose references change "relative" to the location where it is copied or moved.

STEP BY STEP **Use Relative Cell References in a Formula**

GET READY. OPEN the ***04 Budget Cell References*** data file for this lesson.

1. Click cell **B18**.
2. Click in the formula bar and replace 1200 with cell **B3**. Notice that cell B3 is highlighted and surrounded by a blue border while you're modifying the formula (see Figure 4-9).

Figure 4-9
Entering a relative cell reference

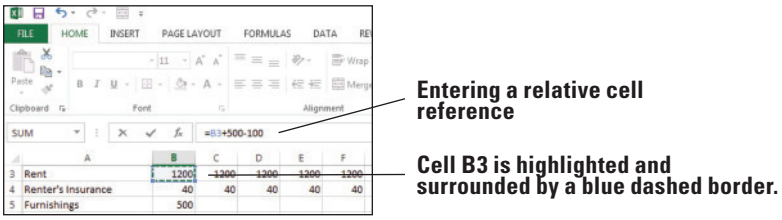


Take Note You can use either uppercase or lowercase when you type a cell reference in a formula. For example, it does not matter whether you type B4 or b4 in the formula you enter.

3. Press **Enter**. The formula in cell B18 now uses a relative cell reference to cell B3.
4. Copy cell **B18** to cell **B21**. The displayed result changes to *400*.
5. Notice in the formula bar that the formula in cell B21 is =B6+500-100, but the formula you copied is =B3+500-100. That's because the original cell reference of cell B3 changed to cell B6 when you copied the formula down three cells, and cell B6 is blank. The cell reference is adjusted relative to its position in the worksheet.

6. An alternate way to use a cell reference is to click the cell being referenced while creating or modifying a formula. With cell B21 still active, click in the formula bar and select **B6**.
7. Click cell **B3**. Cell B3 becomes highlighted and surrounded by a blue dashed border, and cell B3 appears in the formula bar rather than cell B6 (see Figure 4-10). Press **Enter**.

Figure 4-10
Using the mouse to enter a relative cell reference



CERTIFICATION READY? 4.1.1

How do you use a relative cell reference in a formula?

8. SAVE the workbook in your Lesson 4 folder as ***04 Budget Cell References Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

You use relative cell references when you want the reference to automatically adjust when you copy or fill the formula across rows or down columns in ranges of cells. By default, new formulas in Excel use relative references.

In this exercise, you learn two methods for creating formulas using relative references:

- By typing the formula directly into the cell
- By clicking a cell to include in the formula rather than typing the cell reference

The second method is usually quicker and eliminates the possibility of typing an incorrect cell identifier, especially if you need to create a formula with many cell references. For example, it might be easy to make a mistake typing =D2+D7+D9+D12+D14 rather than just clicking each cell to add it to the formula.

You can also reference a range of cells in a formula, which you learn about later in this lesson.

Cell referencing raises another important point about Excel. When you perform math on a series of numbers on paper, they're usually right next to each other in a column or a single row. In a worksheet, the numbers don't have to be adjacent: You can create formulas that reference cells anywhere in the worksheet.

Take Note When constructing a worksheet, plan on using relative cell references unless you know there will be a reason not to adjust the cell identifier when you insert or delete columns and rows.

Using Absolute Cell References in a Formula

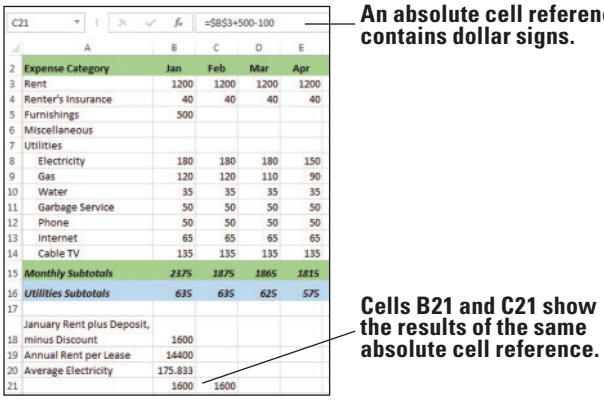
Sometimes you do not want a cell reference to change when you move or copy it. To make an absolute cell reference, use the dollar sign ($) before the column and row of the cell you want to reference.

STEP BY STEP Use an Absolute Cell Reference in a Formula

GET READY. USE the worksheet you modified in the previous exercise.

1. Click cell **B18**.
2. Click in the formula bar and insert dollar signs in the B3 cell reference so it looks like **$B$3**.
3. Press **Enter**. The formula in cell B18 now uses an absolute cell reference to cell B3.
4. Copy cell **B18** to cell **B21**. The displayed result is *1600*, which matches B18.
5. Copy cell **B21** to cell **C21**. The displayed result is still *1600*.
6. Notice in the formula bar that the formulas in cells B21 and C21 are both =$B$3+500-100. Figure 4-11 shows the formula for cell C21. Regardless of where you copy the formula in the worksheet, the formula still refers to cell B3.

Figure 4-11
An absolute cell reference



	A	B	C	D	E
2	Expense Category	Jan	Feb	Mar	Apr
3	Rent	1200	1200	1200	1200
4	Renter's Insurance	40	40	40	40
5	Furnishings	500			
6	Miscellaneous				
7	Utilities				
8	Electricity	180	180	180	150
9	Gas	120	120	110	90
10	Water	35	35	35	35
11	Garbage Service	50	50	50	50
12	Phone	50	50	50	50
13	Internet	65	65	65	65
14	Cable TV	135	135	135	135
15	*Monthly Subtotals*	*2375*	*1875*	*1865*	*1815*
16	*Utilities Subtotals*	*635*	*635*	*625*	*575*
17					
18	January Rent plus Deposit, minus Discount	1600			
19	Annual Rent per Lease	14400			
20	Average Electricity	175.833			
21		1600	1600		

7. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

CERTIFICATION READY? 4.1.1

How do you use an absolute cell reference in a formula?

An **absolute cell reference** refers to a specific cell or range of cells regardless of where the formula is located in the worksheet. Absolute cell references include two dollar signs in the formula, preceding the column letter and row number. The absolute cell reference $B$3, for example, refers to column (B) and row (3). When you copy the formula to any other cell in the worksheet, the absolute reference will not adjust to the destination cells.

Workplace Ready

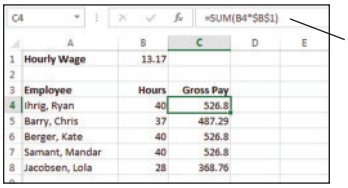
ABSOLUTE CELL REFERENCES FOR PAYROLL TRACKING

Assume you work for a company that hires seasonal workers. All seasonal employees are paid the same hourly wage, but the number of hours each person works each week may vary. You are responsible for creating weekly payroll reports.

You can enter the hourly wage in one cell, and then use absolute cell references in calculations to refer to the hourly wage. In the following figure, each employee's gross pay is calculated using an absolute cell reference to the hourly wage in cell B1, which is $13.17. You could substitute 13.17 for $B$1 in each formula, but if the hourly wage changes, you would need to modify every formula.

Using an absolute cell reference lets you change just the value in cell B1, and then all formulas that reference that cell would change automatically.

In addition, if you add columns for taxes and deductions, regardless of where the Gross Pay column is located, all formulas in that column would still reference cell B1.



Using Mixed Cell References in a Formula

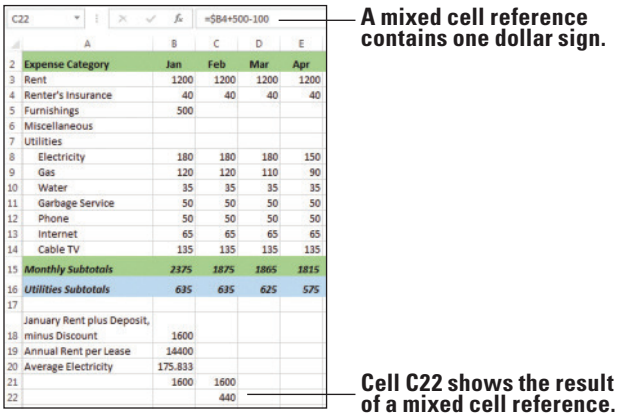
You can also create a mixed reference in which a column or a row is absolute, and the other is relative. For example, if the cell reference in a formula is $A5 or A$5, you would have a mixed reference in which one component is absolute and one is relative.

STEP BY STEP **Use a Mixed Cell Reference in a Formula**

GET READY. USE the worksheet you modified in the previous exercise.

1. Click cell **B21**.
2. Click in the formula bar and delete the dollar sign before **3** in the formula so it looks like **$B3**.
3. Press **Enter**. The formula in cell B21 now uses a mixed cell reference.
4. Copy cell **B21** to cell **C22**. The displayed result is *440*, which is different from the result in B21. That's because the formula in C22 references cell B4 (see Figure 4-12). The dollar sign before the B in the formula is absolute, but the row number is relative.

Figure 4-12
A mixed cell reference



CERTIFICATION READY? 4.1.1

How do you use a mixed cell reference in a formula?

5. Delete the contents of cell **B21**, cell **C21**, and cell **C22**.
6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

A **mixed cell reference** is a cell reference that uses an absolute column or row reference, but not both.

In the exercise, the column portion of the cell reference is absolute and remains unchanged in the formula regardless of where the formula is copied. The row portion of the formula is relative (no dollar sign precedes the row number of 3), so that part of the cell reference changes when the cell is copied.

If you copy a formula across rows or down columns, the relative reference automatically adjusts, and the absolute reference does not adjust. For example, when you copied the formula containing the mixed reference $B3 to a different cell in column C, the reference in the destination cell changed to $B4. The column reference remained the same because that portion of the formula is absolute. The row reference adjusted because it is relative.

Using External Cell References

You've been creating or modifying cell references that refer to cells in the same worksheet. However, you can also refer to cells in another worksheet in the same workbook or to another workbook entirely. References to cells located in a separate workbook are considered *external references*. Unless you specify another worksheet or workbook, Excel assumes your cell references are to cells in the current worksheet.

Referring to Data in Another Worksheet

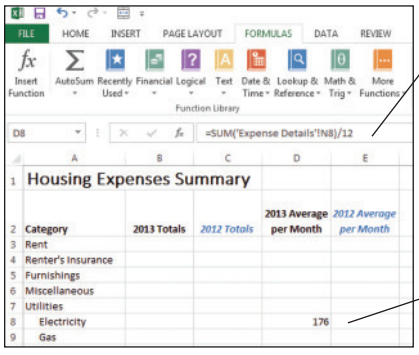
An **external reference** refers to a cell or range in a worksheet in another Excel workbook, or to a defined name in another workbook. (You learn how to define range names later in this lesson.) You might need to use this strategy, for example, to create a summary of data in one worksheet based on data in another worksheet. The basic principles for building these formulas are the same as those for building formulas referencing data within a worksheet.

STEP BY STEP **Refer to Data in Another Worksheet**

GET READY. USE the worksheet you modified in the previous exercise.

1. Click the **Summary** sheet tab in the ***04 Budget Cell References Solution*** workbook.
2. Click cell **D8**. You want the average payment for electricity to appear in this cell, similar to the content that appears in B20 in the Expense Details worksheet. However, your formula must reference the Expense Details worksheet to gather the data.
3. Type **=SUM('Expense Details'!N8)/12** and press **Enter**. This formula divides the value of cell N8 in the Expense Details worksheet by 12. The result is *176*, rounded due to cell formatting applied to the worksheet (see Figure 4-13).

Figure 4-13
Creating a link to a worksheet in the same workbook



Cross Ref You learn about cell formatting in Lesson 6, "Formatting Cells and Ranges."

4. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

The general format of a formula that references a cell in a different worksheet is *SheetName!CellAddress*. That is, you enter the external worksheet name followed by an exclamation point, and then the cell address in the external worksheet. For worksheet names that include one or more spaces, you need to enclose the name in single quotation marks, similar to 'Sheet Name'!CellAddress.

You can also refer to a range of cells in an external worksheet. For example, in the exercise, you can use a similar formula, =SUM('Expense Details'!B8:M8)/12, to accomplish the same task. The portion B8:M8 is called a *range*, as you learned in Lesson 2, "Working with Microsoft Excel 2013." This formula adds the values in the range B8:M8 and then divides them by 12 to produce the average monthly payment for electricity over one year. You see how to work with cell ranges after the next section.

Microsoft calls references to cells in another worksheet or in another workbook *links* because you are essentially linking to data in those remote locations.

Excel provides several functions to help you create formulas more easily. One of the most common functions, SUM, adds the values in a series of cells specified in a range. The construct =SUM(D2:D5) is the same as specifying =D2+D3+D4+D5.

Cross Ref You learn about basic functions in Lesson 5, "Using Functions" and advanced formulas and functions in Lesson 10, "Using Advanced Formulas."

Referencing Data in Another Workbook

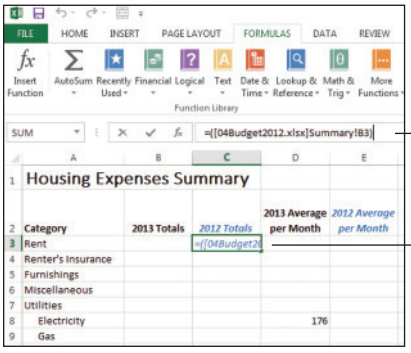
The procedure for referencing data in another workbook is nearly the same as referencing data in another worksheet in the same workbook. The difference is that, when creating a reference to cells in another workbook, you must enclose the other workbook name in square brackets ([ ]) and both workbooks must be open.

STEP BY STEP Reference Data in Another Workbook

GET READY. USE the worksheet you modified in the previous exercise.

1. Open a second workbook, the data file named ***04Budget2012***.
2. In ***04 Budget Cell References Solution***, on the Summary sheet, click cell **C3**.
3. Type **=([04Budget2012.xlsx]Summary!B3)**, as shown in Figure 4-14, and press **Enter**. The formula links to cell B3 on the Summary sheet in the workbook named ***04Budget2012***.

Figure 4-14
An external reference to a cell in another workbook



4. SAVE the workbook and CLOSE it.
5. CLOSE ***04Budget2012***.

PAUSE. LEAVE Excel open to use in the next exercise.

The paired brackets [ ] identify the name of the workbook file, and Summary! identifies the worksheet within that file.

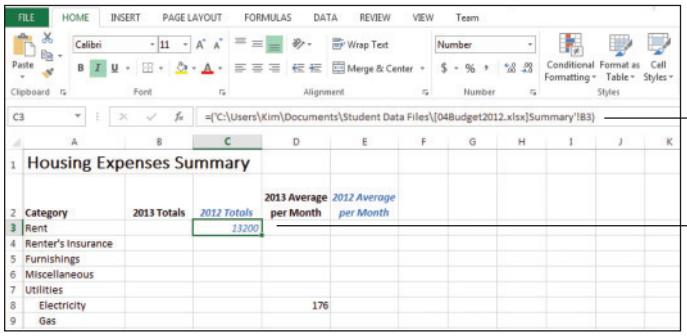
If the data in the referenced cell in the 04Budget2012 worksheet changes, so will the data in the corresponding cell on the Summary worksheet in 04 Budget Cell References Solution. This holds true even if you save 04 Budget Cell References Solution under a different file name.

If you don't have the external workbook open when creating the formula, the Update Values dialog box appears. You must navigate to the location of 04Budget2012.xlsx, select the file, and click OK.

If you close both workbooks and reopen only 04 Budget Cell References Solution , the full path to the 04Budget2012 workbook displays in the formula bar (see Figure 4-15).

Figure 4-15

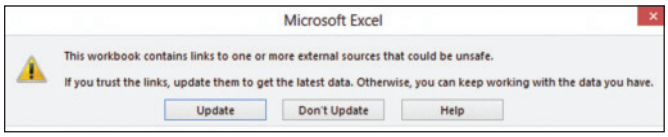
The full path to the linked workbook



If you close and then reopen the workbook that contains the cell reference to the external workbook, a message appears prompting you to update your links (see Figure 4-16).

Figure 4-16

A message dialog box prompting you to update links



USING CELL RANGES IN FORMULAS

Bottom Line

In Excel, groups of cells are called *ranges*. The cell groups are either contiguous or non-contiguous. You can name (define) ranges, change the size of ranges after you define them, and use named ranges in formulas. The Name box and the Name Manager help you keep track of named ranges and their cell addresses. You can also use the Paste Names command to create a list of named ranges and their addresses in a worksheet.

Naming a Range

When you refer to the same cell range over and over, it might be more convenient to give it a name. Excel recognizes the name as the cell range and uses the values in those cells to do what you specified. For instance, if you have a series of sales figures in a column, instead of referring to them as the range *C4:C10*, you can name them *SalesQ3*. Any time you use the name *SalesQ3* in a formula,

Excel would then use the values in those cells.

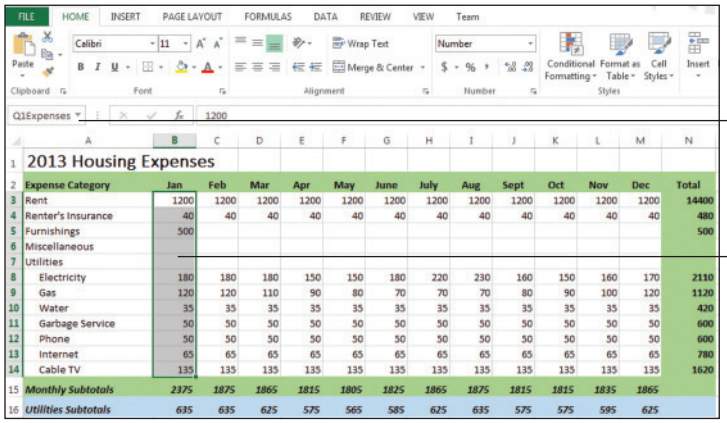
STEP BY STEP Name a Range of Cells

GET READY. OPEN the ***04 Budget Ranges*** data file for this lesson.

1. Click **Enable Content**, if prompted. Click the **Expense Details** sheet tab.
2. Select **B3:B14**. These are the cells to be named.
3. To the left of the formula bar, click the **Name** box.
4. Type a one-word name for the list, such as **Q1Expenses**, and press **Enter**. The range name appears in the Name box (see Figure 4-17). Excel saves this name and uses it in any subsequent reference to this range. (Don't worry about the apparent misnaming of the range. You modify this range to include additional months in an exercise later in this lesson.)

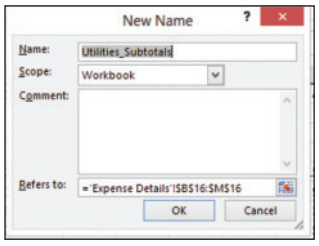
Troubleshooting When naming a range, if a message appears stating that the name already exists, display the Name Manager (discussed in the "Changing the Size of a Range" section) and edit the existing name or delete it and enter a different name.

Figure 4-17
Using the Name box to name a range



5. An alternative way to name a range is to use the New Name dialog box. Select **B16:M16**.
6. On the FORMULAS tab, in the Defined Names group, click **Define Name**. The New Name dialog box appears (see Figure 4-18).

Figure 4-18
Using the New Name dialog box to name a range

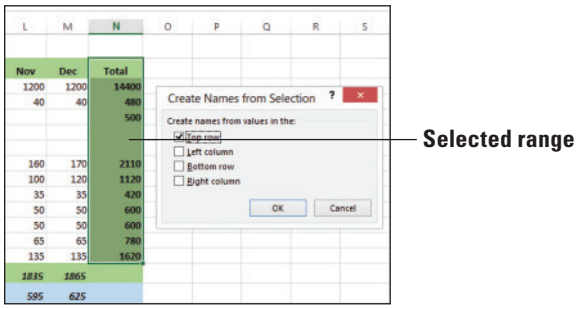


7. Excel uses the row heading as the range name, shown in the Name text box. You can change the name if you like. For this exercise, leave the default name.
8. Open the **Scope drop-down list**. Your options are Workbook, Expense Details, and Summary. The last two entries correspond to individual sheets in the workbook. Close the drop-down list, leaving **Workbook** selected.

9. Enter comments in the Comments text box, if you like.
10. Leave the cell address that appears in the Refers to text box. This is the range you selected. Notice that the sheet name is also included automatically.
11. Click **OK**. The name *Utilities_Subtotals* is saved for the range B16:M16.
12. A third way to name a range is to use the Create Names from Selection dialog box. Select **N2:N14**. This selection includes the column heading label.
13. On the FORMULAS tab, in the Defined Names group, click **Create from Selection**. The Create Names from Selection dialog box appears (see Figure 4-19).

Figure 4-19

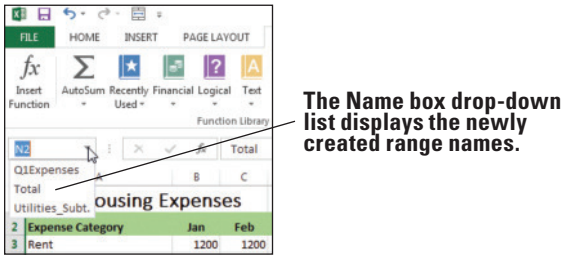
Using the Create Names from Selection dialog box to name a range



14. Excel determines that you want to use the column heading label as the range name. Click **OK**. The range is saved with the name *Total*.
15. Open the Name box drop-down list (see Figure 4-20). You have three named ranges from which to select.

Figure 4-20

Three named ranges appear in the Name box drop-down list



CERTIFICATION READY? 2.3.4

How do you name ranges in a worksheet?

16. SAVE the workbook in your Lesson 4 folder as ***04 Budget Ranges Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

As you learned in Lesson 2, a range is a group of adjacent cells that you select to perform operations on all of the selected cells. You refer to a cell range by separating the first and last cell in the range by a colon, such as B1:B9 and D4:G9. The totals and subtotals in 04 Budget Ranges use cell ranges in their formulas.

A **named range** is a group of cells, and occasionally a single cell, with a designated name. The most common reason to name a range is to refer to it in formulas and functions. Naming ranges or an individual cell according to the data they contain is a time-saving technique, even though it might not seem so when you work with limited data files in practice exercises. However, naming a range in a large or complex worksheet enables you to go to the location quickly, similar to a bookmark.

After selecting a range of cells, you can name the range using three different methods:

- By typing a name in the Name box next to the formula bar
- By using the New Name dialog box

- By using the Create Names from Selection dialog box

Rules and guidelines for naming ranges include the following:

- Range names can be up to 255 characters in length.
- Range names may begin with a letter, the underscore character (_), or a backslash (\). The rest of the name may include letters, numbers, periods, and underscore characters, but not a backslash.
- Range names may not consist solely of the letters "C", "c", "R", or "r", which are used as shortcuts for selecting columns and rows.
- Range names may not include spaces. Microsoft recommends you use the underscore character (_) or period (.) to separate words, such as Fruit_List and Personal.Budget.
- Range names cannot be the same as a cell reference, such as A7 or $B$3.

All names have a scope, either to a specific worksheet or to the entire workbook. The **scope** of a name is the location within which Excel recognizes the name without qualification. Excel requires that a name must be unique within its scope, but you can use the same name in different scopes. In the New Name dialog box, if you select a worksheet name from the Scope list, the scope is at the local worksheet level. If you select Workbook, the scope is at the global workbook level.

If you defined a named range after you entered a cell reference in a formula, you might want to update the existing cell reference to the defined name. Select an empty cell, click the arrow next to Define Name, and click Apply Names. In the Apply Names dialog box, click one or more names, and click OK.

Take Note You can use the same name for equivalent ranges in other worksheets within a workbook. Include the name of the worksheet in brackets before the range name to identify which worksheet you're referring to.

After creating named ranges, you can select a name in the Name box drop-down list to select the named range on the worksheet.

Changing the Size of a Range

You might want to change the size of a range to include or exclude data that you didn't consider when you created the range.

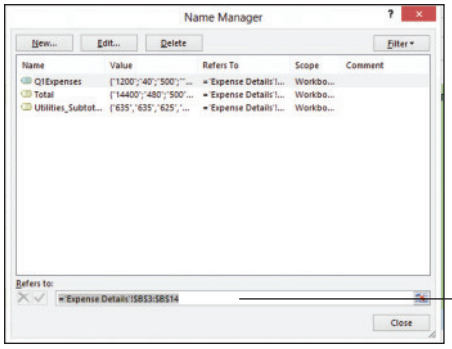
STEP BY STEP **Change the Size of a Range**

GET READY. USE the worksheet you modified in the previous exercise.

1. Click the **Expense Details** sheet, if it's not already active.
2. On the FORMULAS tab, in the Defined Names group, click **Name Manager**.
3. Select **Q1Expenses**.
4. At the bottom of the dialog box, highlight everything in the Refers to box (see Figure 4-21).

Figure 4-21

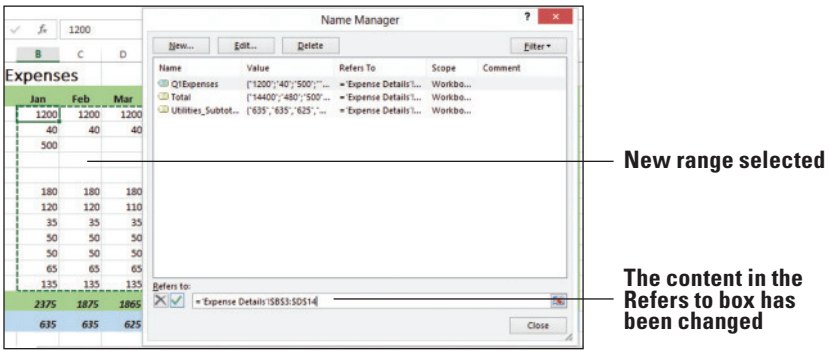
The Refers to box in the Name Manager



5. In the Expenses Details worksheet, select **B3:D14**. The content in the Refers to box in the Name Manager dialog box reflects the new range (see Figure 4-22).

Figure 4-22

The new range appears in the Refers to box.



6. Click **Close**, and then click **Yes** when asked if you want to save your changes.
7. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

To change the parameters of a named range, you can easily redefine the range by using the Name Manager on the FORMULAS tab. The Name Manager contains all the information about named ranges.

Creating a Formula that Operates on a Named Range

You can use the name of any range in a formula, just as you can use a cell identifier.

STEP BY STEP **Create a Formula that Operates on a Named Range**

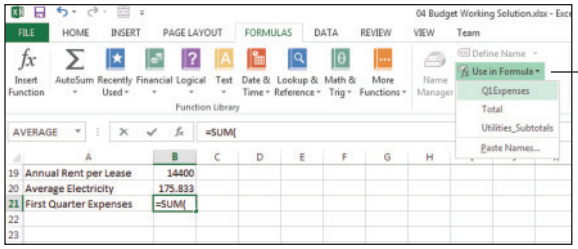
Another Way
You can just enter the formula and range name, such as =sum(Q1Expenses) directly into the cell.

GET READY. USE the worksheet you modified in the previous exercise.

1. In the Expense Details sheet, click **A21**.
2. Type **First Quarter Expenses** and press **Enter**.
3. In cell B21, type **=SUM(**.
4. On the FORMULAS tab, in the Defined Names group, click **Use in Formula**.
5. Select **Q1Expenses** from the list (see Figure 4-23), type **)** to close the equation, and press **Enter**. The total amount of expenses for January through March appears in cell B21.

Figure 4-23

Using a named range in a formula



CERTIFICATION READY? 4.1.3

How do you reference named ranges in a formula?

6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Keeping Track of Named Ranges

As you've seen, the Name box drop-down list contains a list of named ranges for the current worksheet. When you select a named range from the Name box, the range is highlighted in the worksheet. The Name Manager dialog box enables you to work with all of the defined names in the workbook. The Paste Names command lets you maintain a list of named ranges and their cell addresses as data in a worksheet.

STEP BY STEP **Keep Track of Named Ranges**

GET READY. USE the worksheet you modified in the previous exercise.

1. Open the **Name box drop-down list**. The names of all named ranges available in that workbook display.
2. To verify your change to the size of the Q1Expenses range in a previous exercise, select **Q1Expenses**. The range B3:D14 appears highlighted.
3. On the FORMULAS tab, in the Defined Names group, click **Name Manager**. Each named range is listed in the dialog box. You can use Name Manager to create a new range, rename a range, delete a range, and verify the scope of a range, among other tasks.
4. Click **Close** to close the Name Manager.
5. To display range names and their cell ranges as data in the worksheet, select a cell with blank cells to the right and below it, such as cell **P2**.
6. On the FORMULAS tab, in the Defined Names group, click **Use in Formula** and then select **Paste Names**. The Paste Name dialog box opens.
7. Click **Paste List**. Widen the width of column **P** to display all range names fully. Range names display in column P and their cell ranges display in column Q (see Figure 4-24).

Figure 4-24

Range names and cell addresses pasted into a worksheet

M	N	O	P	Q	R	S	T
Dec	Total		Q1Expenses	='Expense Details'!$B$3:$D$14			
1200	14400		Total	='Expense Details'!$N$3:$N$14			
40	480		Utilities_Subtotals	='Expense Details'!$B$16:$M$16			
	500						

8. SAVE the workbook and CLOSE it.

CLOSE Excel.

You can use the Name Manager as a convenient way to confirm the value and reference of a named range or to determine its scope. In addition, you can add, change, or delete names.

It is easier to remember names than to memorize cells and cell ranges. You can create a list of defined names in a workbook using the Paste List command. Doing so makes it simpler to keep track of your data.

SKILL SUMMARY

In this lesson you learned how:	Exam Objective	Objective Number
To display formulas.	Display formulas.	1.4.10
To follow the order of operations.	Define order of operations.	4.1.2
To build basic formulas.		
To use relative, mixed, and absolute cell references in formulas.	Demonstrate how to use references (relative, mixed, absolute).	4.1.1
To create named ranges in worksheets.	Create named ranges.	2.3.4
To reference cell ranges in formulas.	Reference cell ranges in formulas.	4.1.3

Knowledge Assessment

Multiple Choice

Select the best response for the following statements.

1. Which of the following is *not* an arithmetic operator?
   a. +
   b. –
   c. *
   d.]
2. In Excel, what is the result of =1 + 3 * 2 / 2 - 1?
   a. 2
   b. 3
   c. 4
   d. 6
3. Per the order of operations, which of the following is calculated first?
   a. Addition (+) and subtraction (–) (left to right)
   b. Exponentiation (^)
   c. Percent (%)
   d. Negative number (–)
4. Which of the following refers to an unnamed range in the current worksheet?
   a. =SUM(C2:E12)
   b. =Q3Expenses!A19
   c. =[Media.xlsx]MasterList!$D$10
   d. =SUM(budget.summary)
5. Which of the following shows a formula for a reference to another worksheet in the same workbook?
   a. =SUM(C2:E12)
   b. =Q3Expenses!A19
   c. =[Media.xlsx]MasterList!$D$10
   d. =SUM(budget.summary)

6. Which of the following shows a formula for a reference to another workbook?
   a. =SUM(C2:E12)
   b. =Q3Expenses!A19
   c. =[Media.xlsx]MasterList!$D$10
   d. =SUM(budget.summary)
7. Which of the following is an acceptable name for a named range?
   a. C7
   b. subtotal_west
   c. subtotal west
   d. subtotal/west
8. Which of the following is an example of an absolute cell reference?
   a. A9
   b. A$9
   c. $A$9
   d. A9:E9
9. Which of the following is an example of a mixed cell reference?
   a. A9
   b. A$9
   c. $A$9
   d. A9:E9
10. Which of the following can you *not* do using the Name Manager?
    a. Enter values into a range.
    b. Change a range name.
    c. Delete a named range.
    d. Verify the scope of a range.

True / False

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

T F 1. To allow Excel to distinguish formulas from data, all formulas begin with an equal sign (=).

T F 2. Regarding a named range, the scope of a name is the location within which Excel recognizes the name without qualification.

T F 3. Excel recognizes a construct like 3+4= as a legitimate formula.

T F 4. Range names may begin with the caret (^) character.

T F 5. You cannot use a named range in a formula that references another worksheet.

T F 6. Range names cannot be the same as a cell reference, such as C10 or $D$8.

T F 7. Once you name a range, you can change the size of the range using the Name Manager.

T F 8. You can create a new range by selecting the cells and typing a name in the Name box next to the formula bar.

T F 9. The order of operations determines which parts of a formula are calculated before other parts of the formula.

T F 10. The formula = 6 * 2 / 3 produces the same result as =6 * (2 / 3).

Competency Assessment

Project 4-1: Create Basic Formulas

Practice creating addition, subtraction, multiplication, and division formulas.

GET READY. Before you begin these steps, LAUNCH Microsoft Excel and OPEN a blank workbook.

1. Click cell **A1** and type **=20+15**. Press **Enter**. Excel calculates the value in A1 and displays *35* in the cell.

2. In A2, type **=34+51+22**. Press **Tab**. The sum of the three numbers, *107*, appears in the cell.
3. Click **A2** to display the formula for that cell in the formula bar.
4. With A2 selected, click the formula bar. Select **51** and type **15**. Press **Enter**. Notice that the formula result changes to *71*.
5. In A3, type **=35.3+41.6+17.4**. Press **Enter**. The value *94.3* appears in A3.
6. In B1, type **=375–68**. Press **Enter**. The value *307* appears in the cell.
7. In B2, type **=45–13–8**. Press **Enter**. The value in B2 should be *24*.
8. In B3, create a formula to subtract **125** from **189**. The value in B3 should be *64*.
9. In C1, type **=125*4** and press **Enter**. The value that appears in C1 is *500*.
10. In C2, type **=2*7.50*2** and press **Enter**. The value in C2 is *30*.
11. In C3, type **=5+2*8**. The value in C3 is *21*.
12. In D1, create the formula **=795/45** and press **Enter**. Excel returns a value of *17.66667* in D1.
13. In D2, create the formula **=65–29*8+97/5** and press **Enter**. The value in D2 is *–147.6*.
14. In D3, create the formula **=-12+10+20.5/3** and press **Enter**. Excel returns a value of *4.833333* in D3.
15. In E1, type **=2^4** and press **Enter**. The value *16* displays in E1. This formula calculated 2 raised to the 4th power.
16. In E2, type **=25*(1+35%)** and press **Enter**. Excel returns a value of *33.75*. The formula increased 25 by 35%.
17. In E3, type **=3^2*(1+25%)** and press **Enter**. Excel returns a value of *11.25* in E3.
18. SAVE the workbook in your Lesson 4 folder as ***04 Project Math Solution*** and CLOSE it.

PAUSE. LEAVE Excel open to use in the next project.

Project 4-2: Work with the Order of Operations

Practice working with the order of operations.

GET READY. Before you begin these steps, OPEN the ***04 Project Operations Practice*** workbook.

1. Select **C3** and modify the formula by inserting **parentheses** around **5+2**. Press **Enter**. The new formula should be =(5+2)*8. The value in C3 changes from *21* to *56*.
2. Select **D2**. Click in the formula bar and place **parentheses** around **65–29**. Press **Enter**. The new formula should be =(65–29)*8+97/5. The value in D2 changes from *–147.6* to *307.4*.
3. Select **D2**. Click in the formula bar and place **parentheses** around **97/5**. Press **Enter**. The new formula should be =(65–29)*8+(97/5). The value in D2 remains the same at *307.4*.
4. Select **D2**. Click in the formula bar and change the **parentheses** so the formula looks like =(65–(29*8)+97)/5. Press **Enter**. The value in D2 changes to *–14*.
5. SAVE the workbook in your Lesson 4 folder as ***04 Project Operations Solution*** and CLOSE it.

LEAVE Excel open to use in the next project.

Proficiency Assessment

Project 4-3: Link to Data in Other Worksheets within a Workbook

You work for A. Datum Corporation as an accountant. You have a workbook with several sheets that contain budgets for western division offices located in Alaska, Washington, Oregon, and California. You created a summary sheet and named the sheet tab WesternSummary. You will link to information in the four other worksheets to present summary data in one place. Each area worksheet is organized the same way to make it easy to find the same kind of data for each area.

GET READY. Before you begin these steps, OPEN the ***04_ADatum_Start*** workbook.

1. On the WesternSummary sheet, click cell **B3** and enter the formula **=Alaska!B8**. The formula links to the data in cell B8 (the Gross Sales total) on the Alaska worksheet and displays it in cell B3 of the WesternSummary worksheet.
2. In B4, enter the formula **=Washington!B8** to link to the Washington office gross sales total.
3. Create similar formulas to display the Oregon and California gross sales data on the WesternSummary sheet.
4. Compare the figures in column B on the WesternSummary sheet to the appropriate cells in the other worksheets to verify that your formulas are correct. If not, adjust the formulas on the WesternSummary sheet to correct them.
5. Create similar formulas to display the COGS totals in column C, the commissions totals in column D, and the net sales totals in column E on the WesternSummary sheet. (To save time, you can select **B3:B6** and drag the fill handle to the right to fill all additional totals.)
6. Compare the figures on the WesternSummary sheet to the other worksheets to verify that your formulas are correct. If not, adjust the formulas to correct them.
7. SAVE the workbook in your Lesson 4 folder as ***04_ADatum_USWest Solution*** and CLOSE it.

LEAVE Excel open to use in the next project.

Project 4-4: Use External References

You now want to create a summary in a workbook named *04_ADatum_GlobalSales* and link to information in the 04_ADatum_USWest workbook.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***04_ADatum_USWest*** and ***04_ADatum_GlobalSales*** from your data files.

2. In ***04_ADatum_GlobalSales***, on the GlobalSummary sheet, click cell **B4** to make it active.
3. Enter the formula **=([04_ADatum_USWest]WesternSummary!B8)**. The formula links to the data in cell B8 on the WesternSummary sheet in the 04_ADatum_USWest workbook.
4. Copy **B4** to **C4**.
5. SAVE the ***04_ADatum_GlobalSales*** workbook and leave it open.
6. In *04_ADatum_USWest*, on the California tab, change the data in cell B6, which is the Gross Sales figure for Release 3.4, to **284,125**.
7. Check the WesternSummary sheet to verify that the linked cell updated automatically.
8. Save the *04_ADatum_USWest* workbook and close it.
9. CLOSE ***04_ADatum_GlobalSales*** without saving the workbook.
10. Reopen ***04_ADatum_GlobalSales***.
11. Click **Enable Content**, if prompted.

12. Click **Update** if the message window appears.
13. OPEN ***04_ADatum_USWest***.
14. Verify that the data in cell B4 in ***04_ADatum_GlobalSales*** matches the corresponding data in ***04_ADatum_USWest***.
15. SAVE ***04_ADatum_USWest*** in your Lesson 4 folder as ***04_ADatum_USWestSales Solution***.
16. SAVE ***04_ADatum_GlobalSales*** in your Lesson 4 folder as ***04_ADatum_GlobalSales Solution***.
17. CLOSE both workbooks.

LEAVE Excel open for the next project.

Mastery Assessment

Project 4-5: Name a Range and Use the Range in a Formula

Blue Yonder Airlines wants to analyze the sales and expense data from its four-year history.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***04 Income Analysis*** workbook for this lesson.
2. On the Sales sheet, select **B4:E4** and use the **Define Name** command on the FORMULAS tab to name the range. Accept the defaults in the dialog box.
3. Select **B5:E5** and use the Name box to name the range. Use the row heading as the range name using an underscore to separate the words.
4. Select **A6:E6**. Use the **Create from Selection** command on the FORMULAS tab to name the range. Use the default option in the dialog box.
5. Create a named range for **A7:E7** using the method of your choice.
6. Create a formula in cell F4 that sums the values in B4:E4 using the range name.
7. Repeat Step 6 for the other three income sources.
8. Create range names on the Expenses sheet using the method of your choice.
9. Total the four expense categories on the Expenses sheet as you did on the Sales sheet. Be careful to select the worksheet range name rather than the workbook range name in each case. You use this workbook again in Lesson 5 and create formulas with functions on the Analysis sheet.
10. SAVE the workbook in your Lesson 4 folder as ***04 Income Analysis Solution*** and then CLOSE the file.

LEAVE Excel open to use in the next project.

Project 4-6: Create a Personal Budget

Most people agree that it is vitally important for a business to have a realistic budget. It is equally important for an individual to have a personal budget—a plan for managing income and expenses. Using a personal budget worksheet prepopulated with data, create range names to identify specific blocks of data, and then use those range names in formulas you create to compare budgeted to actual costs.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***04 Personal Budget Start*** workbook for this lesson.
2. On the Expenses sheet, name cell B7 **Income_Total**. If you use the Define Name command, use the defaults in the New Name dialog box.

3. Name cells B10:B14 **Home_Total**.
4. Create named ranges similar to Step 3 for budgeted amounts for the Daily Living Total, Transportation Total, and Entertainment Total categories.
5. Create a formula in cell D4 that subtracts the actual amount from the budgeted amount. The cells in column D are formatted to display a dash if the budgeted amount and the actual amount are the same. Copy the formula in D4 to **D5:D6**.
6. Create a formula in cell D7 that subtracts the actual amount from the budgeted amount using the Income_Total range name.
7. Beginning with the Home section, create a formula in the non-Total cells in column D that subtracts the actual amount from the budgeted amount using the range name for the budgeted amount. For example, the formula in cell D10 would be =Home_Total-C10. Be aware that the formulas might result in a positive number, no difference, or negative numbers.
8. Beginning with the Home section, create a formula in the Total cells in column D that subtracts the actual amount from the budgeted amount. Use the cell address for the budgeted amount.
9. In cells E10 through E14, create a formula that divides the budgeted amount by the income total. Use the range names Home_Total and Income_Total in the formula.
10. In cell E15, create a formula that divides the budgeted amount by the income total using a cell reference to the Home total and the range name Income_Total.
11. Complete column E per Steps 9 and 10 for the remaining cells.
12. The figure that displays in cell B36 is based on a named range, but part of the range is incorrect. Use the Name Manager or the Show Formulas command to analyze the formula for the Expenses range and correct it.
13. SAVE the workbook in your Lesson 4 folder as ***04 Personal Budget Solution*** and then CLOSE the file.

CLOSE Excel.

Using Functions 5

LESSON SKILL MATRIX

Skills	Exam Objective	Objective Number
Exploring Functions		
Displaying Dates and Times with Functions		
Summarizing Data with Functions	Demonstrate how to apply the SUM function.	4.2.1
	Demonstrate how to apply the COUNT function.	4.2.3
	Demonstrate how to apply the AVERAGE function.	4.2.4
	Demonstrate how to apply the MIN and MAX functions.	4.2.2
Using a Financial Function		
Using Formulas to Create Subtotals		
Uncovering Formula Errors		
Displaying and Printing Formulas		

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KEY TERMS

- argument
- AutoSum
- AVERAGE function
- COUNT function
- COUNTA function
- function
- MAX function
- MIN function
- NOW function
- PMT function
- SUBTOTAL function
- SUM function
- TODAY function
- trace arrow

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Creating and maintaining a personal budget requires more than simply estimating and tracking expenses. You often want to see subtotals of certain data, for example, to determine how much you spend quarterly. Sometimes you want to know your average payment per month for expenses that vary throughout the year. Budgets are also working documents—they change over time and might require modifications to the structure. Creating proper formulas builds flexibility into your worksheets. Excel provides a wealth of predefined functions to help you enter formulas quickly and accurately. In this lesson, you learn how to use simple Excel functions by working on an annual budget of household expenses.

SOFTWARE ORIENTATION

FORMULAS Tab

The FORMULAS tab in Excel 2013, shown in Figure 5-1, provides access to a library of formulas and functions. On this tab, you can use commands for quickly inserting functions, inserting totals, and displaying a visual map of cells that are dependent on a formula.

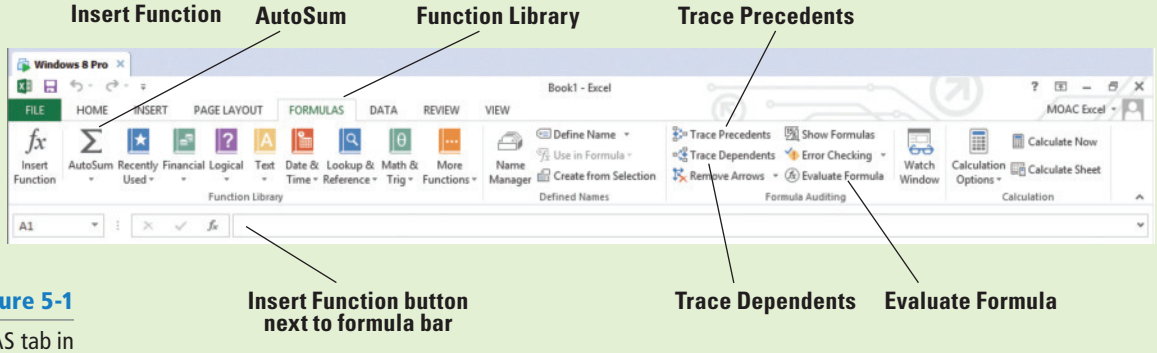


Figure 5-1

The FORMULAS tab in Excel 2013

In this lesson, you learn how to use a variety of simple functions to perform calculations in a budgeting worksheet. You also learn subtotaling techniques, how to work with formula errors, and how to print formulas.

EXPLORING FUNCTIONS

Bottom Line

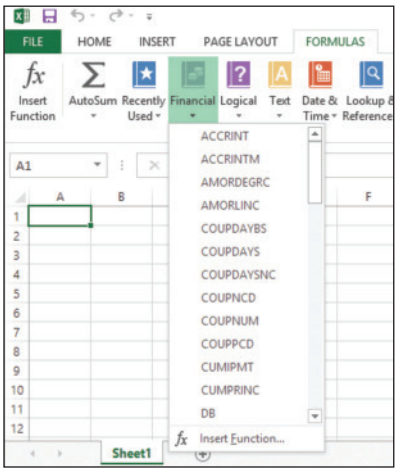
A **function** is a predefined formula that performs a calculation. Excel's built-in functions are designed to perform different types of calculations—from simple to complex. When you apply a function to specific data, you eliminate the time involved in manually constructing a formula. Using functions ensures the accuracy of the formula's results. You can type functions directly into Excel or use the tools on the FORMULAS tab to help you fill in formulas with the correct syntax.

STEP BY STEP Explore Functions

GET READY. LAUNCH Excel and open a new, blank workbook.

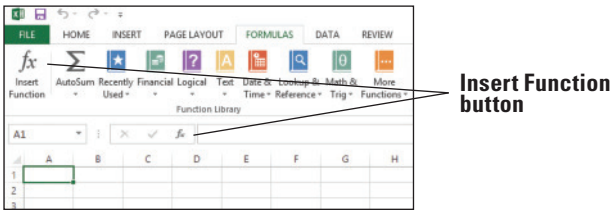
1. To become familiar with the tools available to build formulas and insert functions, click the **FORMULAS** tab. Excel arranges functions by category in the Function Library group, such as Financial, Logical, Text, and so on. Click the **Financial** button arrow to display a drop-down list of functions (see Figure 5-2). If you create a financial function, you can simply scroll through the list and select the function you want.

Figure 5-2
The Financial group menu of functions



2. You can also find a function using the Insert Function dialog box. On the FORMULAS tab or on the formula bar, click the **Insert Function** button. The buttons are shown in Figure 5-3.

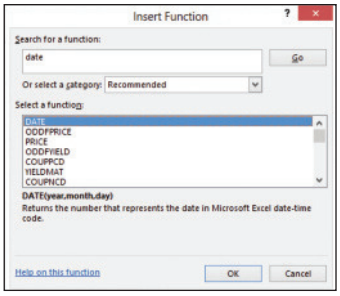
Figure 5-3
The Insert Function buttons



3. In the Insert Function dialog box, type a description of what you want to do. For example, type **date** and click **Go**. Excel returns a list of functions that most closely match your description (see Figure 5-4).

Figure 5-4

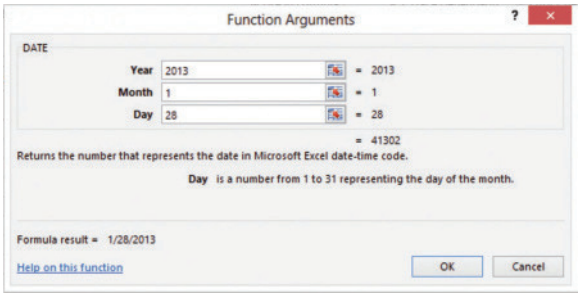
The Insert Function dialog box displaying a list of functions in response to your request



4. With DATE selected in the Select a function list, click **OK**. The Function Arguments dialog box opens.
5. Enter the current year, the number of the current month, and the number of the current day (see Figure 5-5). Click **OK**. The date is entered into the worksheet in cell A1.

Figure 5-5

Entering data into the Function Arguments dialog box



6. **SAVE** the workbook to your Lesson 5 folder as ***05 Practice Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Functions are a simplified way of entering formulas. The parameters of a function are called **arguments**. Each function name is followed by parentheses, which let Excel know where the arguments begin and end. Arguments appear within the parentheses and are performed from left to right. Depending on the function, an argument can be a constant value, a single-cell reference, a range of cells, or even another function. If a function contains multiple arguments, the arguments are separated by commas.

Even functions that require no arguments must still have parentheses following the name, as in =TODAY(). Table 5-1 lists common Excel functions, all of which are covered in this lesson.

Table 5-1

Common Excel functions

Function	Description	Formula Syntax
AVERAGE	Calculates the arithmetic mean, or average, for the values in a range of cells.	=AVERAGE(first value, second value,...)
MAX	Analyzes an argument list to determine the highest value (the opposite of the MIN function).	=MAX(first value, second value,...)
MIN	Determines the smallest value of a given list of numbers or arguments.	=MIN(first value, second value,...)
NOW	Returns the current date and time.	=NOW()
PMT	Determines the payment for a loan based on the interest rate of a loan, the number of payments to be made, and the loan amount.	=PMT(rate, nper, pv)

Table 5-1
Common Excel functions

Function	Description	Formula Syntax
SUBTOTAL	Returns a subtotal for a list	=SUBTOTAL(function number,ref1,[ref2],...)
SUM	Takes all of the values in each of the specified cells and totals their values.	=SUM(first value, second value,...)
TODAY	Returns the current date.	=TODAY()

DISPLAYING DATES AND TIMES WITH FUNCTIONS

Bottom Line

In Excel, dates are numbers. When you see a date in a worksheet, it's actually a numeric value formatted to look like a date. The same principle applies to time. Two functions display the current date and/or time in a worksheet: NOW and TODAY. NOW returns the current date and time, whereas TODAY returns the current date but not the time. Neither of these functions uses arguments, so you insert blank parentheses after them. With NOW and TODAY, you can create automatically updated dates and times in worksheets that you frequently revisit and update.

Exploring Dates

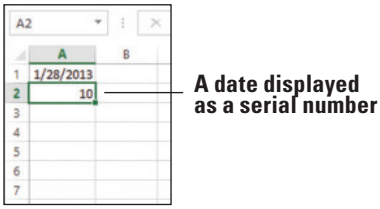
Excel stores dates as sequential serial numbers. By default, January 1, 1900 is serial number 1, January 2, 1900 is serial number 2, and so on. Each date is a number that represents the number of days that have elapsed since January 1, 1900. You can add, subtract, multiply, and divide using a date, just as you can with any other number. How the date is displayed depends on the format you assign to it.

STEP BY STEP **Explore Dates**

GET READY. USE the workbook you created in the previous exercise.

1. In cell A2, type **1/10/1900** and press **Enter**.
2. Select cell **A2**.
3. On the HOME tab, in the Number group, open the **Number Format** menu and select **General**. The value in A2 changes to *10* (see Figure 5-6). When you enter a date manually into Excel, the format of the cell automatically changes to Date. Because the date 1/10/1900 is the tenth day after (and including) January 1, 1900, the value is 10. Excel's Date format displays the value as a date, and the General format displays the value as a number.

Figure 5-6
In Excel, a date is actually a serial number.



4. With A2 still selected, change the number format to **Short Date** using the Number Format menu. The cell displays *1/10/1900*.
5. Click cell **A3**, type **40000** and press **Enter**. Because the cell is formatted as General by default, the value appears as a number.
6. Click cell **A2**.
7. On the HOME tab, in the Clipboard group, click the **Format Painter**, and then click cell **A3**. The formatting of A2 is copied to A3. The value in A3 now appears as a date: *7/6/2009.*
8. In cell A4, type **=A3-A2** and press **Enter**. The result is *39990*, which is the number of days between the two dates.

9. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Using TODAY

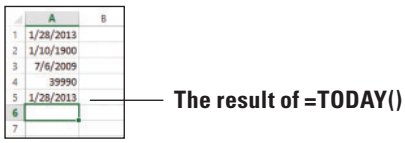
The **TODAY function** returns the current date in a worksheet. The value returned by the TODAY function automatically updates every time you change the worksheet. To specify a date that doesn't change, enter the date you want to use manually.

STEP BY STEP Use the TODAY Function

GET READY. USE the workbook you modified in the previous exercise.

1. In cell A5, type **=TODAY()** and press **Enter**. The current date displays (see Figure 5-7).

Figure 5-7
The result of the TODAY function



2. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

The default format for the TODAY function is mm/dd/yyyy, but you can have it appear in any date format.

You can also use TODAY to calculate an interval. For example, you can enter a formula to calculate the number of years you have lived by creating a formula to subtract your birth date from today's date, like this: =YEAR(TODAY())-1993.

Using NOW

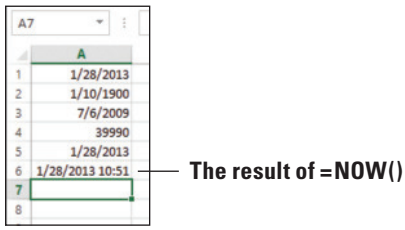
The **NOW function** returns today's date and the current time, in the default format of mm/dd/yyyy hh:mm. You can apply any date or time format to values returned by the NOW function.

STEP BY STEP Use the NOW Function

GET READY. USE the workbook you modified in the previous exercise.

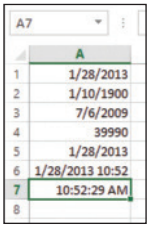
1. In cell A6, type **=NOW()** and press **Enter**. The column width automatically expands, and the current date and time display (see Figure 5-8).

Figure 5-8
The result of the NOW function



2. Copy cell A6 to A7.
3. Select cell A7.
4. On the HOME tab, in the Number group, from the Number Format menu, select Time. The current time without the date appears in A7 (see Figure 5-9).

Figure 5-9
The result of the NOW function with the Time format applied



5. SAVE the workbook and CLOSE it.

PAUSE. LEAVE Excel open to use in the next exercise.

Like TODAY, the NOW function also updates automatically every time you change the worksheet. However, because it also reports the time, its value changes every time you save the worksheet, even if that is several times during a single day.

In addition to simply displaying the current date and time, you might use the NOW function in a calculation that requires a value based on the current date and time.

Workplace Ready

USING DATES AT WORK

The Excel TODAY and NOW functions are handy when you simply want to display the current date, the date and time, or the date in a calculation. However, using TODAY or NOW means the date changes every time someone opens the workbook. Sometimes it's important that the date remains static. For example, you create an invoice with the invoice date at the top. You also have a line that says, "Terms: Net 30." A Net 30 term means you expect your customer to pay your invoice within 30 days of the date of your invoice. It's important that your invoice date never changes to avoid confusing your customer and so you get paid on time.

	A	B	C	D
1	Proseware, Inc.		Invoice	11839
2			Date	5/1/2014
3			Terms	Net 30
4				
5	Description	Number of Hours	Rate	Total
6	Custom project A	10	$100.00	$ 1,000.00
7	Custom project B	5	$100.00	$ 500.00
8	Custom project C	15	$100.00	$ 1,500.00
9	Custom project D	12	$100.00	$ 1,200.00
10	Custom project E	10	$100.00	$ 1,000.00
11	TOTAL			$ 5,200.00

Enter a date, not the TODAY or NOW function.

SUMMARIZING DATA WITH FUNCTIONS

Bottom Line

Functions provide an easy way to perform mathematical work on a range of cells, quickly and conveniently. This section shows you how to use some of the basic functions in Excel: SUM, COUNT, COUNTA, AVERAGE, MIN, and MAX.

Using the SUM Function

Adding a range of cells is one of the most common calculations performed on worksheet data. The **SUM function** totals all of the cells in a range, easily and accurately. **AutoSum** makes that even easier by calculating (by default) the total from the adjacent cell through the first nonnumeric cell, using the SUM function in its formula. SUM is usually the first function most people learn how to use in Excel. In fact, you already saw it in action in Lesson 4, "Using Basic Formulas."

STEP BY STEP Use the SUM Function

GET READY. LAUNCH Excel if it is not already running.

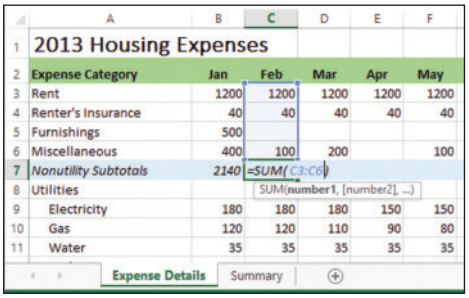
1. OPEN the ***05 Budget Start*** data file for this lesson. Click **Enable Editing**, if prompted. This workbook is similar to the ***04 Budget Start*** workbook used in Lesson 4, but with modifications to accommodate the current lesson.
2. In cell B7, type **=SUM(B3:B6)** and press **Enter**. The result, 2140, is the sum of January nonutility expenses.

Troubleshooting

If you get an error message when entering a basic Excel formula, remember that all formulas must start with an equal sign (=). A function is simply a predefined formula, so you must use the equal sign.

3. Click in cell **C7**. Click the **FORMULAS** tab and then click the top part of the **AutoSum** button. The SUM function appears with arguments filled in, but only C6 is included. Type **C3:** before C6 to correct the range (see Figure 5-10). Press **Enter**. The result, 1340, is the sum of February nonutility expenses.

Figure 5-10
Using the SUM function



CERTIFICATION READY? 4.2.1

How do you create a formula with the SUM function?

4. Copy cell **C7** to **D7:M7** to enter the remaining subtotals.
5. Copy cell **N6** to **N7** to enter the total nonutility expenses.
6. SAVE the workbook to your Lesson 5 folder as ***05 Budget Math Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

The alternative to the SUM function is to create an addition formula using cell references for every cell value to be added, such as the following:

=B7+C7+D7+E7+F7+G7+H7+I7+J7+K7+L7+M7

The easier way to achieve the same result is to use the SUM function or AutoSum. AutoSum is a built-in feature of Excel that recognizes adjacent cells in rows and columns as the logical selection to perform the AutoSum.

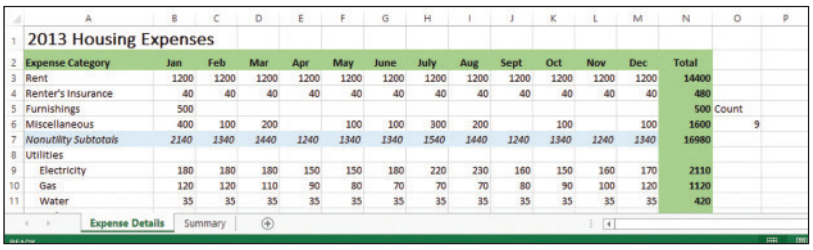
Using the COUNT Function

Statistical functions, such as SUM and COUNT, compile and classify data to present significant information. Use the **COUNT function** when you want to determine how many cells in a range contain a number.

STEP BY STEP Use the COUNT Function

1. USE the workbook you modified in the previous exercise.
2. In cell O5, type **Count** and press **Enter**. This is the label identifying the formula you will enter in the next step.
3. In cell O6, type **=COUNT(B6:M6)** and press **Enter**. The result, *9*, is the number of months in which you budgeted for miscellaneous expenses (see Figure 5-11).

Figure 5-11
Result of the COUNT function



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	2013 Housing Expenses															
2	Expense Category	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total		
3	Rent	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200	14400		
4	Renter's Insurance	40	40	40	40	40	40	40	40	40	40	40	40	480		
5	Furnishings	500												500	Count	
6	Miscellaneous	400	100	200		100	100	300	200		100		100	1600	9	
7	*Nonutility Subtotals*	*2140*	*1340*	*1440*	*1240*	*1340*	*1340*	*1540*	*1440*	*1240*	*1340*	*1240*	*1340*	16980		
8	Utilities															
9	Electricity	180	180	180	150	150	180	220	230	160	150	160	170	2110		
10	Gas	120	120	110	90	80	70	70	70	80	90	100	120	1120		
11	Water	35	35	35	35	35	35	35	35	35	35	35	35	420		

Expense Details | Summary

CERTIFICATION READY? 4.2.3

How do you create a formula with the COUNT function?

4. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

In this exercise, you could have included the row heading—Nonutility Subtotals—in the formula range, along with the data in cells B6 through M6. The COUNT function disregards A6 because it doesn't contain a number, and the function disregards blank cells. You'll see this effect using COUNTA in the next exercise.

Using the COUNTA Function

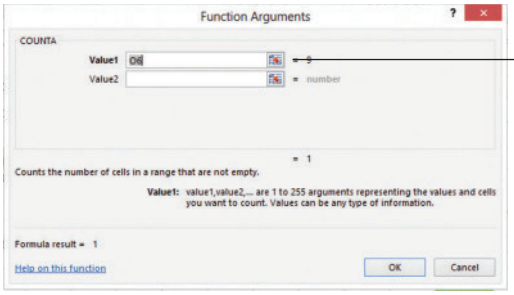
The **COUNTA function** returns the number of cells in the selected range that contain text or values, but not blank cells. In this exercise, you use the Insert Function button on the formula bar to enter the function.

STEP BY STEP Use the COUNTA Function

GET READY. USE the workbook you modified in the previous exercise.

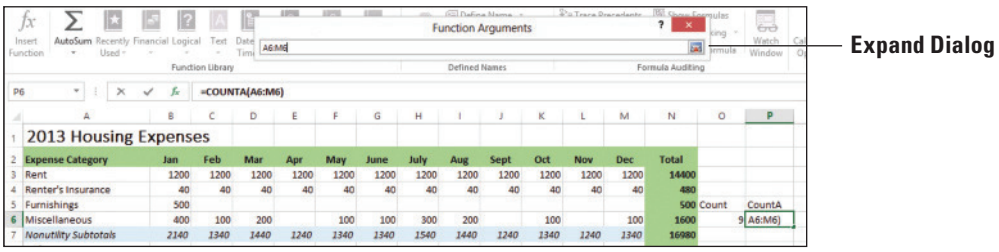
1. In cell P5, type **CountA** and press **Enter**. This is the label identifying the formula you will enter in the next step.
2. In cell P6, on the formula bar, click the **Insert Function** button.
3. In the Insert Function dialog box, in the Search for a function text box, type **counta** and then click **Go**.
4. Select **COUNTA** in the results list and click **OK**. The Function Arguments dialog box opens.
5. Click **Collapse Dialog** (see Figure 5-12). The box collapses to a single entry box.

Figure 5-12
The Function Arguments dialog box



6. Select **A6:M6**. The new range appears in the dialog box.
7. Click **Expand Dialog** shown in Figure 5-13, and click **OK** to close the dialog box. The result, *10*, is the number of nonblank cells in the range.

Figure 5-13
Expand Dialog



8. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Using the AVERAGE Function

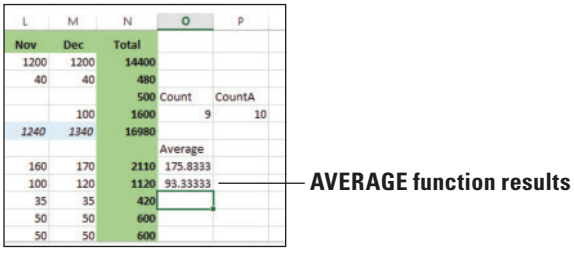
The **AVERAGE function** adds a range of cells and then divides by the number of cell entries, determining the mean value of all values in the range. Regarding your personal budget, because the cost of electricity and gas fluctuates seasonally, it might be interesting to know the average monthly amount you might spend over the course of an entire year.

STEP BY STEP — Use the AVERAGE Function

GET READY. USE the workbook you modified in the previous exercise.

1. In cell O8, type **Average** and press **Enter**.
2. In cell O9, type **=AVERAGE(B9:M9)** and press **Enter**. The result, *175.8333,* is your average expected monthly electricity bill.
3. In cell O10, type **=AVERAGE(B10:M10)** and press **Enter**. The result, *93.33333*, is your average expected monthly gas bill (see Figure 5-14).

Figure 5-14
The results of the AVERAGE function



CERTIFICATION READY? 4.2.4

How do you create a formula with the AVERAGE function?

4. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Using the MIN Function

The **MIN function** allows you to determine the minimum value in a range of cells. Let's use this function to determine what your minimum electricity and gas bills will be. Instead of entering the formula manually, you'll use the Function Library group on the FORMULAS tab to build the formula.

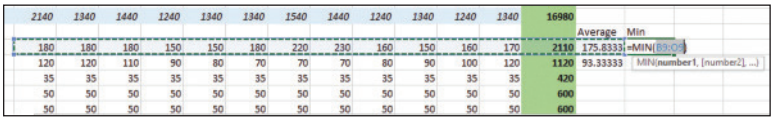
STEP BY STEP Use the MIN Function

GET READY. USE the workbook you modified in the previous exercise.

1. In cell P8, type **Min** and press **Enter**.
2. Click in cell **P9** and then click the **FORMULAS** tab.
3. Click the **AutoSum** button arrow, and then select **Min** from the menu. The range B9:O9 is automatically selected (see Figure 5-15). This range is incorrect, so you need to edit it.

Figure 5-15

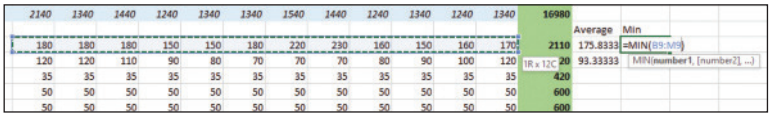
The wrong range is selected for the MIN function.



4. Click cell **B9**, hold down the **Shift** key, and click cell **M9**. The range B9:M9 appears in the function, which now looks like =MIN(B9:M9). See Figure 5-16. Press **Enter**. The result, *150,* appears, which is the lowest expected electricity bill for the year.

Figure 5-16

Modifying the MIN function



CERTIFICATION READY? 4.2.2

How do you create a formula with the MIN function?

5. Copy cell **P9** to cell **P10**. The result, *70,* is the lowest expected gas bill for the year.
6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Using the MAX Function

The **MAX function** returns the largest value in a set of values. The MAX function works the same way as MIN, except MAX determines the maximum value in a range of cells. To use MAX in a formula, let's enter the function manually.

STEP BY STEP Use the MAX Function

CERTIFICATION READY? 4.2.2

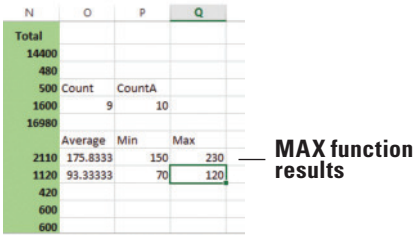
How do you create a formula with the MAX function?

GET READY. USE the workbook you modified in the previous exercise.

1. In cell Q8, type **Max** and press **Enter**.
2. In cell Q9, type **=MAX(B9:M9)** and press **Enter**. The result, *230*, is the highest monthly electricity bill that you expect to receive.
3. Copy cell **Q9** to **Q10**. The result, *120*, is the highest monthly gas bill that you expect to receive (see Figure 5-17).

Figure 5-17

The results of the MAX function



4. SAVE the workbook to your Lesson 5 folder and CLOSE it.

PAUSE. LEAVE Excel open to use in the next exercise.

USING A FINANCIAL FUNCTION

Bottom Line

Functions provide a wide variety of pre-determined calculations for you to choose from, allowing you to easily perform a complex calculation and use it in your worksheet. So far, you have worked with mathematical and statistical functions. Financial functions, in contrast, are designed specifically for various finance tasks that you might want to work on.

Use PMT

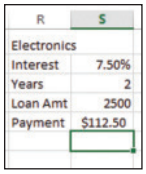
The **PMT function** requires a series of inputs regarding interest rate, loan amount (principal), and loan duration, and then calculates the resulting loan payment. In this exercise, you're interested in purchasing a large flat-panel television, a sound system, and a game box with several games. You calculate the payments you need to make on a two-year loan to purchase the equipment.

STEP BY STEP Use the PMT Function

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***05 Budget PMT*** data file for this lesson.
2. In cell R2, type **Electronics** and press **Enter**.
3. In cell R3, type **Interest** and press **Enter**.
4. In cell R4, type **Years** and press **Enter**.
5. In cell R5, type **Loan Amt** and press **Enter**.
6. In cell R6, type **Payment** and press **Enter**.
7. In cell S3, type **7.5%** and press **Enter**. This is the interest rate on the loan.
8. In cell S4, type **2** and press **Enter**. This is the number of years in which the loan will be repaid.
9. In cell S5, type **2500** and press **Enter**. This is the loan amount, which will cover the total cost of the equipment.
10. In cell S6, type **=–PMT(S3/12,S4*12,S5)** and press **Enter**. The result, *$112.50*, is your calculated monthly payment (see Figure 5-18).

Figure 5-18
The result of the PMT function



11. SAVE the workbook to your Lesson 5 folder as ***05 Budget PMT Solution*** and CLOSE it.

PAUSE. LEAVE Excel open to use in the next exercise.

The PMT function calculates a loan payment and uses the syntax =PMT(*rate*, *nper*, *pv*, [*fv*], [*type*]). The three required arguments for the PMT function are:

- **Rate:** The interest rate charged per period (for example, per month)
- **Nper:** The total number of payments for the loan
- **Pv:** The present value of the loan—in other words, how much you owe; also known as the *principal*

Optional arguments include the future value (fv), which is a cash balance you want to attain after the last payment is made, and type, which indicates when payments are due using the number 1 (due at the beginning of a period) or 0 (due at the end of a period).

When functions take more than one argument, you enter them in a single set of parentheses, separated by commas.

For the purposes of your budget, you include the negative sign (–) at the beginning of the PMT function (=–PMT(S3/12, S4*12,S5)) because the function calculates a payment as a negative value by default. By including the negative sign, the payment appears as a positive number. This follows a basic rule of mathematics: The negative of a negative is a positive.

You divide the first set of values by 12 because 7.5% is the annual interest rate, and dividing it by 12 gives you the monthly interest rate. You multiply the second set of values by 12 to convert the loan term from years to months.

USING FORMULAS TO CREATE SUBTOTALS

Bottom Line

Many Excel veterans use formulas to create subtotals. Subtotaling lets you more easily analyze large sets of data. You can specify ranges for subtotals even if the ranges are not contiguous. In this section, you learn how to use the SUBTOTAL function applied to cell ranges and named ranges.

Selecting and Creating Ranges for Subtotaling

You learn how to select ranges and name them in Lesson 4. You use those skills in this section to prepare to subtotal parts of your budget worksheet.

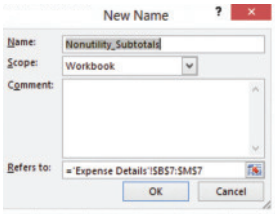
STEP BY STEP **Select and Create Ranges for Subtotaling**

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***05 Budget Subtotals*** data file for this lesson.
2. Select **B7:M7**.
3. On the FORMULAS tab, in the Defined Names group, click the **Define Name** button. The New Name dialog box opens.

4. In the Name text box, verify that Nonutility_Subtotals appears (see Figure 5-19). Click **OK**. This names a range for the nonutility subtotal figures.

Figure 5-19
The New Name dialog box



5. SAVE the workbook to your lesson 5 folder as ***05 Budget Subtotals Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Building Formulas for Subtotaling

You can calculate subtotals using the **SUBTOTAL function**, which returns a subtotal for a list. This function recognizes values, cell references, ranges, and named ranges, and totals values created using SUM, AVERAGE, COUNT, and many other functions. This exercise shows you how to use the SUBTOTAL function to sum ranges of cells, both named and unnamed.

STEP BY STEP — Build Formulas to Subtotal

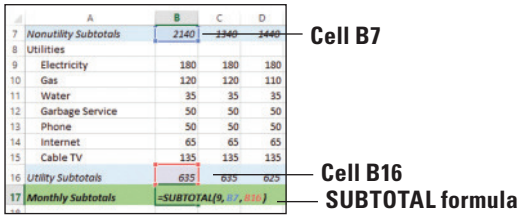
GET READY. USE the workbook you modified in the previous exercise.

Cross Ref

This lesson shows you how to build subtotals using the SUBTOTAL function. Lesson 9 , "Working with Data and Macros," covers grouping and outlining to produce subtotals.

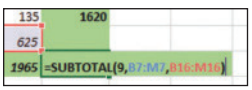
1. In cell B17, type **=SUBTOTAL(9,B7,B16)**, as shown in Figure 5-20. Press **Enter**. This formula adds the nonutility subtotal and utility subtotal for January.

Figure 5-20
Entering the SUBTOTAL formula to add two cells that include SUM functions



2. Copy cell **B17** to **C17:M17**. All monthly subtotals are entered.
3. In cell N17, type **=SUBTOTAL(9,B7:M7,B16:M16)**, as shown in Figure 5-21. Press **Enter**. This formula adds all nonutility and utility expenses for the year.

Figure 5-21
Entering the SUBTOTAL function to add two cell ranges



4. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

The SUBTOTAL function uses the syntax =SUBTOTAL(*function_num*,*ref1*,[*ref2*],...).

As you enter the SUBTOTAL function, Excel, displays a list of the function numbers for the first argument. The function number for SUM is 9. You can learn the function numbers for other functions, such as AVERAGE, COUNT, and COUNTA, when entering the SUBTOTAL function or by searching for SUBTOTAL in Excel Help.

Ref1 is the first cell reference, cell range, or named range you want to subtotal. You can include additional cells or ranges by separating them with commas.

In the exercise, you also used the SUBTOTAL function to calculate the total for the budget in cell N17. Creating a total is a standard bookkeeping technique, and allows you to track and adjust subtotals while keeping the final total current.

Modifying Ranges for Subtotaling

Once you create a range in a subtotal, you can easily modify it by editing the range in the formula. You can also modify ranges that are already used in formulas that include the SUBTOTAL function.

STEP BY STEP Modify Ranges for Subtotaling

GET READY. USE the workbook you modified in the previous exercise.

1. In cell N17, notice that the result of the current formulas is *24,230*.
2. Use the formula bar to modify the formula in N17 like this: **=SUBTOTAL(9,Nonutility_Subtotals,Utility_Subtotals)**. See Figure 5-22. Press **Enter**. This formula replaces the cell ranges with named ranges to add all nonutility and utility expenses for the year, and the result remains the same at *24,230*.

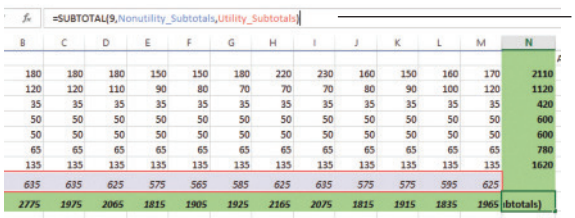
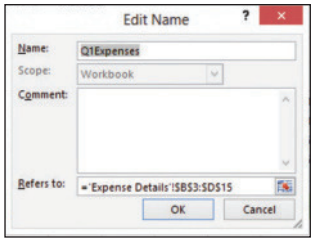


Figure 5-22
Modifying the SUBTOTAL function to use named ranges

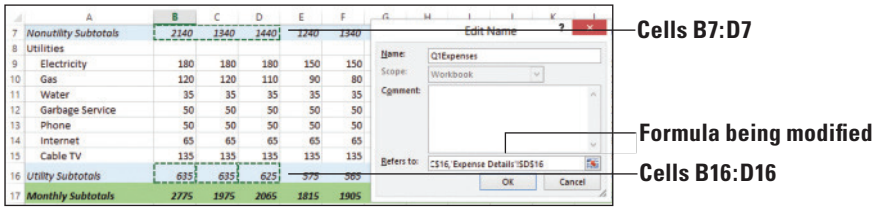
3. Click in cell **B19** and then click in the formula bar. Change the formula from =SUM(Q1Expenses) to **=SUBTOTAL(9,Q1Expenses)**. This cell sums the named range Q1Expenses. Because the named range includes monthly data and subtotals, you need to correct the range to include only subtotal figures.
4. On the FORMULAS tab, in the Defined Names group, click **Name Manager**.
5. Select **Q1Expenses** in the list and click **Edit**. The Edit Name dialog box opens (see Figure 5-23).

Figure 5-23
The Edit Name dialog box



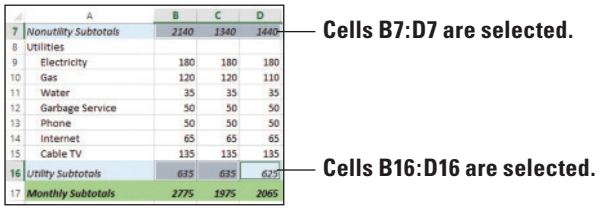
6. Highlight everything in the Refers to text box and press **Backspace** to delete it.
7. Click cell **B7**, press and hold the **Shift** key, and click **D7**. The range B7:D7 is highlighted.
8. Press and hold the **Ctrl** key while clicking cells **B16**, **C16**, and **D16**. The selections are shown in Figure 5-24.

Figure 5-24
Selecting multiple ranges to include in the Q1Expenses named range



9. In the Edit Name dialog box, click **OK**.
10. In the Name Manager dialog box, click **Close**.
11. To verify that you selected the proper ranges for the Q1Expenses range, open the **Name** box drop-down list (to the left of the formula bar) and select **Q1Expenses**. The ranges B7:D7 and B16:D16 are selected (see Figure 5-25).

Figure 5-25
Verifying the new ranges for Q1Expenses



12. Create named ranges for **Q2Expenses (E7:G7, E16:G16)**, **Q3Expenses (H7:J7, H16:J16)**, and **Q4Expenses (K7:M7, K16:M16)**.
13. Copy the formula from cell **B19** to **B20:B22**. Edit the formulas in cells **B20**, **B21**, and **B22** to use the appropriate named range. For example, the formula in cell B20 should be =SUBTOTAL(9,Q2Expenses).
14. SAVE the workbook to your Lesson 5 folder and CLOSE it.

PAUSE. LEAVE Excel open to use in the next exercise.

UNCOVERING FORMULA ERRORS

Bottom Line

Formulas, because of the sometimes-complex mathematics behind them, are prone to errors when you enter them manually. Fortunately, Excel provides easy-to-use tools to find and correct problems. In this exercise, you intentionally create an error, and then learn how to correct that error.

Reviewing Error Messages

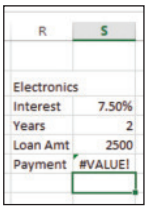
The best way to resolve an error is to analyze, or audit, the error message Excel provides for you. A warning icon appears to the left of cell errors, and clicking that icon provides a pop-up menu with formula evaluation and formula editing commands, and access to Excel Help.

STEP BY STEP Review an Error Message

GET READY. LAUNCH Excel if it is not already running.

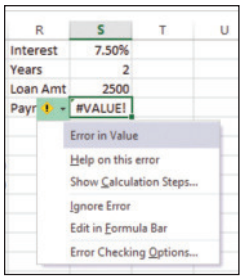
1. OPEN the ***05 Budget Error*** data file for this lesson.
2. Click in cell **S6**.
3. Edit the formula to change S3 to **R3** and press **Enter**. The first cell reference in the PMT formula now points to the wrong cell. A #VALUE! error displays in cell S6 (see Figure 5-26).

Figure 5-26
An error displays in cell S6.



4. Click in cell **S6**. Click the small, yellow warning icon to the left of the cell. A pop-up menu appears (see Figure 5-27). The first item tells you that there is a value error in the function.

Figure 5-27
The pop-up menu for the error



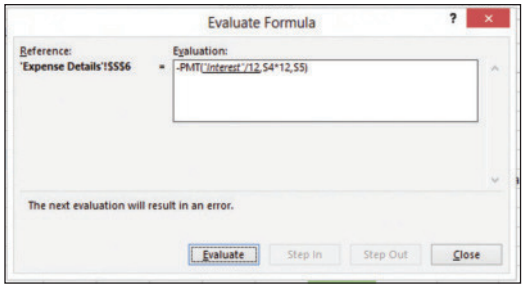
5. In the menu, select **Help on this error**. Excel Help opens to a page on information regarding formula errors. Browse the help topics to see if any of the potential solutions apply to your situation.
6. CLOSE the Excel Help window.
7. SAVE the workbook to your Lesson 5 folder as ***05 Budget Error Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Notice the small green triangle in the upper-left corner of cell S6. This means the cell contains a formula error.

To evaluate the error in the formula, select the Show Calculation Steps option from the pop-up menu that appears after you click the warning icon. The Evaluate Formula dialog box, shown in Figure 5-28, indicates the first part of the function is incorrect. In this case, the reference to cell R3 points to a cell containing text. The cell reference should be S3, which contains the interest figure.

Figure 5-28
The Evaluate Formula dialog box



Once you know how to correct an error, you can click the warning icon and select Edit in Formula Bar from the pop-up menu. Make the necessary corrections directly in the formula.

Tracing and Removing Trace Arrows

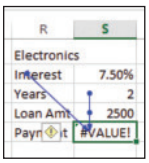
It's not always easy to resolve a formula error, even using the Show Calculation Steps command, the Evaluate Formula dialog box, and Excel Help. Another method is to use **trace arrows**, which show the relationship between formulas and the cells they refer to.

STEP BY STEP **Trace a Formula and Remove Trace Arrows**

GET READY. USE the workbook you modified in the previous exercise.

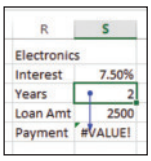
1. Select cell **S6** if it's not already selected.
2. On the FORMULAS tab, in the Formula Auditing group, click **Trace Precedents**. Two arrows appear (see Figure 5-29). One arrow extends from cell R3 to cell S6, and another (combined) arrow extends from cells S4 and S5 to S6. The arrows indicate that the formula in cell S6 refers to cells R3, S4, and S5, referred to as *precedent cells*.

Figure 5-29
The worksheet showing trace precedents



3. On the FORMULAS tab, in the Formula Auditing group, click **Remove Arrows**. The trace arrows disappear from the worksheet.
4. Click cell **S4**. On the FORMULAS tab, in the Formula Auditing group, click **Trace Dependents**. One arrow appears from cell S4 to cell S6 (see Figure 5-30). The arrow indicates that cell S4 is part of the formula in cell S6.

Figure 5-30
The worksheet showing trace dependents



5. SAVE the workbook and CLOSE it.

PAUSE. LEAVE Excel open to use in the next exercise.

You can use trace precedents and trace dependents for formulas that reference cells in another workbook. However, the external workbook must be open before you use the trace commands.

DISPLAYING AND PRINTING FORMULAS

Bottom Line

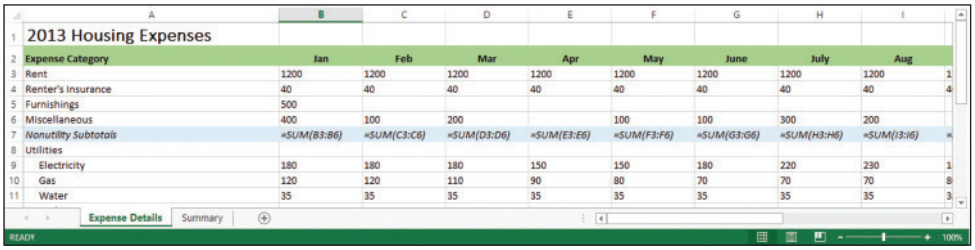
When you audit the formulas in a worksheet, you might find it useful to print the worksheet with the formulas displayed. In this exercise, you display formulas for printing.

STEP BY STEP Print Formulas

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***05 Budget Print*** from your Lesson 5 folder.
2. On the FORMULAS tab, in the Formula Auditing group, click **Show Formulas**. The formulas appear in the worksheet (see Figure 5-31).

Figure 5-31
Formulas displayed in the worksheet

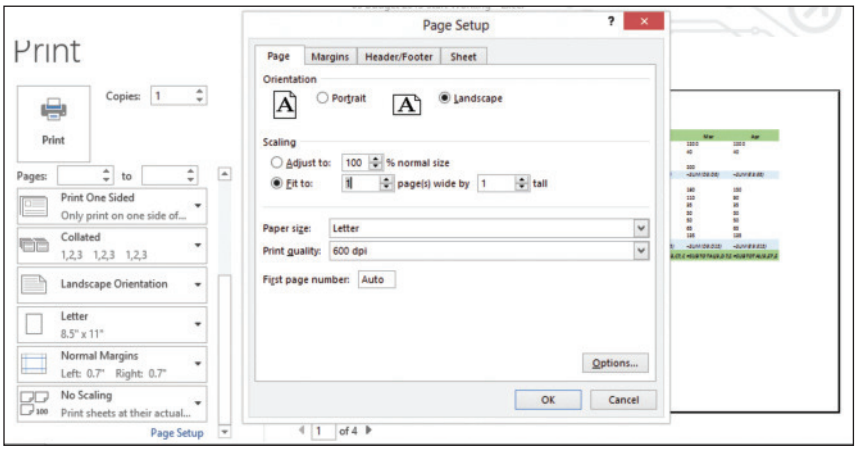


Another Way

You can also display formulas in the worksheet by pressing Ctrl + ` (the grave accent mark). The grave accent mark is usually located on a key on the upper-left part of the keyboard.

3. Click the **FILE** tab. Click **Print** and view the Print Preview.
4. Click the **Portrait Orientation** button and select **Landscape Orientation**.
5. At the bottom of the print settings, click the **Page Setup** link to open the Page Setup dialog box.
6. On the Page tab of the dialog box, click **Fit to:** and leave the defaults as **1 page(s) wide** by **1 tall** (see Figure 5-32). Click **OK** to close the dialog box.

Figure 5-32
Settings in the Page Setup dialog box



7. At the top-left corner of the Backstage view window, click the **Print** button to print the worksheet with formulas displayed.

Cross Ref

You learn more about print options in Lesson 7 , "Formatting Worksheets."

8. On the FORMULAS tab, in the Formula Auditing group, click **Show Formulas** again to stop displaying formulas in the worksheet.
9. SAVE the workbook to your Lesson 5 folder as ***05 Budget Print Solution*** and CLOSE it.

CLOSE Excel.

SKILL SUMMARY

In this lesson you learned how:	Exam Objective	Objective Number
To find tools for building functions on the FORMULAS tab.		
To display dates and times with functions.		
To use the SUM function.	Demonstrate how to apply the SUM function.	4.2.1
To use the COUNT function.	Demonstrate how to apply the COUNT function.	4.2.3
To use the AVERAGE function.	Demonstrate how to apply the AVERAGE function.	4.2.4
To use the MIN and MAX functions.	Demonstrate how to apply the MIN and MAX functions.	4.2.2
To use the PMT financial function.		
To use formulas to create subtotals.		
To respond to formula errors.		
To display and print formulas.		

Knowledge Assessment

Multiple Choice

Select the best response for the following statements.

1. Which of the following calculates the total from the adjacent cell through the first nonnumeric cell by default, using the SUM function in its formula?
   a. AVERAGE
   b. AutoSum
   c. COUNTA
   d. MAX
2. The arguments of a function are contained within which of the following?
   a. brackets
   b. asterisks
   c. commas
   d. parentheses

3. When using the SUBTOTAL function, which is the function number for the SUM function?
   a. 1
   b. 4
   c. 9
   d. 11
4. You want to add a range of cells and then divide by the number of cell entries, determining the mean value of all values in the range. Which function do you use?
   a. SUBTOTAL
   b. AVERAGE
   c. COUNT
   d. PMT
5. Which of the following is *not* a required argument for the PMT function?
   a. Fv
   b. Rate
   c. Nper
   d. Pv
6. You want to calculate the number of nonblank cells in your worksheet. Which function do you use?
   a. SUM
   b. COUNT
   c. COUNTA
   d. MAX
7. You want to create a formula that calculates the number of years you have lived. You were born in 1991. Which of the following formulas is correct?
   a. =YEAR(TODAY())-1991
   b. =YEAR(TODAY())+1991
   c. =YEAR(COUNT())-1991
   d. =YEAR(COUNT())+1991
8. Which of the following statements accurately describes the default selection for AutoSum?
   a. You must make the selection before clicking AutoSum.
   b. By default, AutoSum totals all entries above the cell in which the formula is located, even if the cells contain a mix of numeric and nonnumeric content.
   c. By default, AutoSum calculates the total from the adjacent cell through the first nonnumeric cell.
   d. AutoSum does not have a default selection.
9. You want to sum multiple noncontiguous cell ranges that are named. Which of the following is best to use?
   a. AutoSum
   b. SUBTOTAL
   c. MAX
   d. MIN
10. The COUNT and MIN functions are examples of which category of functions?
    a. text
    b. statistical
    c. financial
    d. logical

True / False

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

T F 1. All functions require arguments within parentheses.

T F 2. Using functions helps to ensure the accuracy of a formula's results.

T F 3. The TODAY function returns the current date in a worksheet.

T F 4. The AVERAGE function returns the number of cells in the selected range that contain text or values, but not blank cells.

T F 5. When functions take more than one argument, you should enter them in multiple sets of nested parentheses, separated by commas.

T F 6. In the PMT function, the Nper argument is the total number of payments for the loan.

T F 7. You can use a range in the SUBTOTAL function, but you cannot modify the range once it's in use.

T F 8. A cell cannot be a trace dependent and a trace precedent for the same formula.

T F 9. You can refer to the TODAY and NOW functions in other formulas to perform calculations.

T F 10. To evaluate the error in the formula, select the Edit in Formula Bar option from the pop-up menu that appears after you click the warning icon.

Competency Assessment

Project 5-1: Use Statistical Functions to Analyze Game Wins and Losses

You work for Wingtip Toys and have been playing three new games each day to master them, hoping to demo the games in the retail store. You've been keeping track of your wins and losses in a worksheet. A "1" indicates a win, and a "0" indicates a loss.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***05 Game Stats*** data file for this lesson.
2. In cell E3, type **=AVERAGE(B3:D3)** and press **Enter**.
3. Copy the formula in **E3** to **E4:E12**.
4. Click cell **G2**.
5. On the FORMULAS tab, in the Function Library group, click the **AutoSum** button arrow and select **Count Numbers**.
6. Click cell **B3** and drag the mouse pointer to cell **D12**.
7. Release the mouse and press **Enter** to accept the range B3:D12. The result, *30*, is the total number of times you played the games in 10 days.
8. In cell G3, type **=SUM(B3:D12)** and press **Enter.** The result, *17*, represents the total number of times you won the games.
9. In cell G4, type **=G2-G3** and press **Enter.** The result, *13*, represents the total number of times you lost the games.
10. On the FORMULAS tab, in the Formula Auditing group, click **Show Formulas**. The formulas appear in the worksheet.
11. Click the **Show Formulas** button again to turn off the display of formulas.
12. SAVE the workbook to your Lesson 5 folder as ***05 Game Stats Solution*** and then CLOSE the file.

LEAVE Excel open to use in the next project.

Project 5-2: Create Formulas to Calculate Totals and Averages

An employee at Wingtip Toys has entered second quarter sales data into a worksheet. You will enter formulas to calculate monthly and quarterly totals and average sales.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***05 Wingtip Toys Sales*** from the data files for this lesson.
2. Click cell **B11**, type **=SUM(B4:B10)**, and press **Enter**.

3. Click cell **C11**. On the FORMULAS tab, in the Function Library group, click **Insert Function**.
4. In the Insert Function dialog box, select **SUM** and click **OK**.
5. In the Function Arguments dialog box, click **Collapse Dialog** and select **C4:C10**, if it's not already entered.
6. Click the **Expand Dialog** button and click **OK** to close the dialog box.
7. Copy the formula from **C11** to **D11**.
8. Click cell **E4**. On the FORMULAS tab, in the Function Library group, click the **AutoSum** button. Press **Enter** to accept **B4:D4** as the cells to total.
9. Click cell **E5** and then in the Function Library group click **Insert Function**. In the Insert Function dialog box, **SUM** will be the default. Click **OK**.
10. The range B5:D5 should appear in the Number1 box in the Function Arguments dialog box. Click **OK** to close the dialog box.
11. Click cell **E5** and use the fill handle to copy the formula to **E6:E10**.
12. Click cell **E11**. In the Function Library group click **AutoSum**. Press **Enter** to accept the range as **E4:E10**.
13. Click cell **F4**. Click the **Insert Function** button. Select **AVERAGE** in the Insert Function dialog box and click **OK**. In the Function Arguments dialog box, click **OK**.
14. Click in the formula bar and change **E4** to **D4**. Click **OK**.
15. Click cell **F4** and use the fill handle to copy the formula to **F5:F11**.
16. SAVE the workbook to your Lesson 5 folder as ***05 Wingtip Toys Sales Solution*** and then CLOSE the file.

LEAVE Excel open to use in the next project.

Proficiency Assessment

Project 5-3: Compare Payments

Monica recently graduated from college and needs to replace her current vehicle. She wants to use Excel 2013 to help her decide whether she should buy a lower priced vehicle or something newer.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***05 Compare Payments*** from the data files for this lesson.
2. Enter a formula that displays today's date in cell B2.
3. Enter a formula in cell B4 that calculates a monthly interest rate based on the rate displayed in B3. Be sure to use an absolute cell reference to B3.
4. Use the PMT function to calculate loan payments for each dollar amount below the Amount Borrowed heading. Be sure to use absolute cell references for the rate and nper arguments, and add a minus sign before PMT in the formula so the result is a positive value.
5. SAVE the workbook to your Lesson 5 folder as ***05 Compare Payments Solution*** and then CLOSE the file.

LEAVE Excel open for the next project.

Project 5-4: Resolve Formula Errors

You work for the School of Fine Arts and have been asked to correct errors in a student GPA worksheet.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***05 Fine Art Formulas*** from the data files for this lesson.
2. An error occurs in cell F4. Examine the formula in the formula bar and correct the error manually.
3. For the error in cell F6, click the **warning icon** and use one of the options in the pop-up list to correct the error.
4. For the error in cell F12, use the Show Calculation Steps command to determine the source of the error and then correct the error using the formula bar.
5. One of the formulas at the bottom of the worksheet needs to be corrected. Use trace arrows to determine which formula's range includes an extra cell and correct the formula.
6. SAVE the workbook to your Lesson 5 folder as ***05 Fine Art Formulas Solution*** and then CLOSE the file.

LEAVE Excel open for the next project.

Mastery Assessment

Project 5-5: Build Formulas to Track Merchandise Stock Levels

Wide World Importers sells a variety of fine wool rugs, textiles, ceramics, furniture, and statues from the Middle East. The company tracks levels of stock in nine different categories, and keeps several units of each type of stock in five warehouses spread across the region. You have been asked to track all 45 stock levels.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***05 Importers Stock*** from the data files for this lesson.
2. Use the SUM formula to total the number of stock units in each warehouse.
3. Calculate the number of stock units that are at zero (0) across all six warehouses in cell B14.
4. Calculate the maximum number of stock units in any warehouse in cell B15.
5. Calculate the minimum number of stock units in any warehouse in cell B16.
6. SAVE the workbook to your Lesson 5 folder as ***05 Importers Stock Solution*** and then CLOSE the file.

LEAVE Excel open for the next project.

Project 5-6: Complete the Analysis Sheet in the Budget Workbook

Blue Yonder Airlines wants to analyze the sales and expense data from its four-year history. You will complete the Analysis sheet to summarize the data.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***05 Income Analysis Start*** from the data files for this lesson.
2. On the Analysis sheet, calculate average sales for each of the four service categories using range names. Use Name Manager to examine range names in the workbook before you enter the formulas.
3. Calculate the average expenses for each of the four service categories.
4. Calculate the maximum sales for each of the four service categories.
5. Calculate the maximum expenses for each of the four service categories.
6. SAVE the workbook to your Lesson 5 folder as ***05 Income Analysis Solution*** and then CLOSE the file.

CLOSE Excel.

Circling Back 1

The Graphic Design Institute offers associate's and bachelor's degrees in graphic design, with a full slate of in-classroom and online classes. Students from the United States and several other countries attend the Institute as full-time students during fall and spring semesters, or by participating in accelerated programs offered twice a year.

As an employee in the organization's home office, you create workbooks related to the Institute's programs and fundraising efforts.

Project 1: Creating a Workbook and Entering Data

Your first task is to create a workbook that can serve as the initial structure for recording students' GPAs. The student names you type in the worksheet are in an accelerated program and work with a specific instructor.

GET READY. LAUNCH Excel if it is not already running.

1. Open a new, blank workbook.
2. In cell A1, type **Graphic Design Institute** and press **Enter**.
3. In cell A2, type **Instructor: Sachin Karnik** and press **Enter**.
4. In cells A3:F3, type the following:
   Name
   ID
   GD1
   DM1
   Type1
   GPA
5. In cells A4:A14, type the following:
   Con, Aaron
   Cunha, Goncalo
   Byham, Richard A.
   Klimov, Sergey
   Chopra, Manish
   Davison, Eric
   Hensien, Kari
   Levitan, Michal
   Paschke, Dorena
   Wang, Tony
   Ribaute, Delphine
6. Double-click the right border of column **A** to expand the column width.
7. In cell B4, type **13001**.
8. Copy cell **B4** to B5. In cell in B5, change 13001 to **13002**.
9. Highlight cells **B4:B5**, point to the fill handle in the lower-right corner of cell B5, drag it to cell **B14**, and release the mouse.
10. Click the **FILE** tab to open Backstage view. In the left pane, click **Save As** to display the save options.
11. Under Save As, click **Computer**, and then click **Browse**.
12. Use the left navigation pane in the Save As dialog box to navigate to your student data folder.

13. In the toolbar near the top of the Save As dialog box, click **New folder**. A folder icon appears with the words *New folder* selected.
14. Type **Circling Back** and press **Enter**.
15. Double-click the **Circling Back** folder.
16. In the File Name box, type ***GPA Solution***.
17. Click the **Save** button.
18. CLOSE the file.

LEAVE Excel open for the next project.

Project 2: Using Basic Formulas and Functions

The Graphic Design Institute is supported in part by individual and corporate tax-deductible contributions. Contributors are asked to select a fund to which their contribution applies. It is your responsibility to create some simple statistics to help senior management understand the number of contributors, the average amount contributed per organization and per individual, and the minimum and maximum dollar amounts of all contributions.

GET READY. LAUNCH Excel if it is not already running.

1. Open ***Contributions*** from the student data files.
2. In cell A33, type **Total Contributions** and press **Enter**.
3. In cell C33, type **=SUM(C4:C32)** and press **Enter**.
4. Select cells **C4:C32**. On the FORMULAS tab, in the Defined Names group, click the **Define Name** button arrow and select **Define Name**.
5. In the New Name dialog box, accept the defaults and click **OK**. A range named Amount is created.
6. In cell B35, type **=COUNT(C4:C32)** and press **Enter**. The result represents the number of contributions made to Graphic Design Institute.
7. Click in **B36**. On the FORMULAS tab, in the Function Library group, click **Insert Function**. In the Insert Function dialog box, search for **AVERAGE**, select it in the Select a function list box, and click **OK**.
8. In the Function Arguments dialog box, click **Collapse Dialog** and select **C4:C21**.
9. Click the **Expand Dialog** button and click **OK** to close the dialog box. A triangle appears in the upper left corner of B36 and an error message button is displayed. Click the **button arrow**, and then click **Ignore Error**. The result in B36 represents the average dollar amount contributed by organizations.
10. Copy the formula in cell B36 to **B37**.
11. With B37 selected, change the range in the formula to **C22:C32**. A triangle appears in the upper left corner of B37 and an error message button is displayed. Click the **button arrow**, and then click **Ignore Error**. The result in B37 represents the average dollar amount contributed by individuals.
12. In cell B38, type **=MIN(Amount)** and press **Enter**. This formula uses the named range and displays the minimum dollar amount contributed by an organization or individual.
13. In cell B39, type **=MAX(Amount)** and press **Enter**. This formula displays the maximum dollar amount contributed by an organization or individual.
14. SAVE the workbook to your Lesson 5 folder as ***Contributions Solution*** in the Circling Back folder.

LEAVE the workbook open for the next project.

Project 3: Configuring a Workbook for Printing

You have prepared a workbook with data related to contributions to the Institute and have been asked to print copies for a meeting to be attended by senior management.

GET READY. USE the workbook you saved in the previous project.

1. Select cells **A1:C39**.
2. Click the **PAGE LAYOUT** tab, and in the Page Setup group, click the **Print Area** button and select **Set Print Area**.
3. Click the **FILE** tab to access Backstage view.
4. Click **Print** and view the document in the Print Preview pane.
5. Click the **Scaling** button arrow, and then click **Custom Scaling Options**.
6. In the Page Setup dialog box, in the Adjust to box, type **110**. This action makes the text a little larger without having to change the font in the document. Click **OK**.
7. Click **Print**.
8. Click anywhere in the worksheet to remove highlighting from the selection.
9. Check the Quick Access Toolbar. If you do not see the Quick Print button, click the **Customize Quick Access Toolbar** arrow at the end of the toolbar and select **Quick Print**. The Quick Print button appears on the toolbar, which you can use to print any Excel document in the future.
10. SAVE the workbook to your Lesson 5 folder as ***Contributions Print Solution*** in the Circling Back folder, and then CLOSE the file.

CLOSE Excel.

Formatting Cells and Ranges 6

LESSON SKILL MATRIX

Skills	Exam Objective	Objective Number
Inserting and Deleting Cells	Insert and delete cells.	2.1.6
Manually Formatting Cell Contents	Modify cell alignment and indentation.	2.2.2
	Change font and font styles.	2.2.3
	Apply highlighting.	2.2.7
	Apply Number formats.	2.2.6
	Wrap text within cells.	2.2.5
	Merge cells.	2.2.1
Copying Cell Formatting with the Format Painter	Use Format Painter.	2.2.4
Understanding Paste Special Options		
Formatting Cells with Styles	Apply cell styles.	2.2.8
Working with Hyperlinked Data	Insert hyperlinks.	1.2.2
Applying Conditional Formatting to Cells	Apply conditional formatting.	2.3.1
Clearing a Cell's Formatting		

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KEY TERMS

- **align**
- **attribute**
- **conditional formatting**
- **font**
- **Format Painter**
- **hyperlink**
- **merged cells**
- **Mini toolbar**
- **Paste Special**
- **Rules Manager**
- **style**
- **wrap**

Contoso, Ltd.'s income is

© Fertnig /iStockphoto

generated by four physicians and a physician's assistant (PA). Working in collaboration with the physicians, the PA sees patients who need an appointment when all the physicians' schedules are full. Many chronically ill patients whose conditions require frequent monitoring are scheduled with the PA. Because the firm often experiences hectic schedules and overtime, management is considering adding a nurse practitioner (NP) to balance the patient load. An NP is a registered nurse who provides some of the same care as a physician. For instance, in most states, an NP can prescribe medications. In this lesson, you use Excel to manage the relevant data associated with Contoso's physicians and their assistants to determine whether an NP should be added to the staff.

SOFTWARE ORIENTATION

Formatting Excel Worksheets

The Excel HOME tab shown in Figure 6-1 contains formatting and editing commands that help you enhance the appearance and readability of your worksheets. You will use commands from almost every group on this tab as you learn to apply formatting to data, copy formatting, and apply styles.

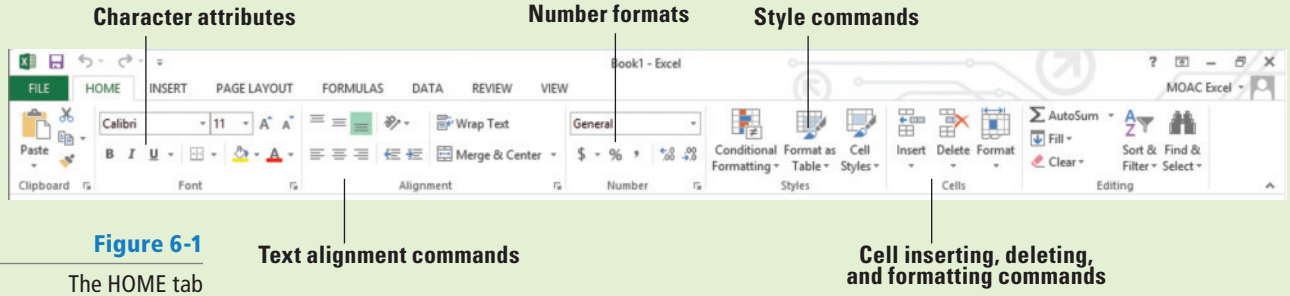


Figure 6-1
The HOME tab

Excel provides many ways to format text and values in a worksheet. In the business world, worksheets are usually printed or shared with others. Therefore, you want your worksheets to be as appealing and understandable as possible.

INSERTING AND DELETING CELLS

Bottom Line

After creating a worksheet, you might decide to add more data or delete unnecessary data. Although you can insert or delete entire rows and columns, sometimes you just need to work with a single cell or a range of cells. You can insert or delete single cells or ranges of cells, but be aware that doing so affects the location of other cells.

Inserting Cells into a Worksheet

When you insert a cell in a column, you force the other cells in the same column to move down. Inserting a cell into a row shifts the other cells in the same row to the right.

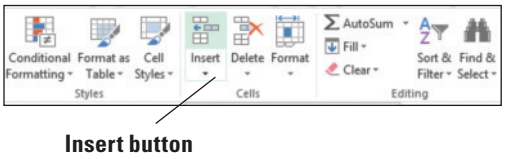
STEP BY STEP **Insert Cells into a Worksheet**

GET READY. Launch Microsoft Excel.

1. OPEN the ***06 Patient Visits Insert Delete*** data file for this lesson.
2. Click in cell **G5** to make it the active cell.
3. On the HOME tab, in the Cells group, click the top part of the **Insert** button, as shown in Figure 6-2. All cells in column G beginning with G5 shift down one cell.

Figure 6-2

The Insert button in the Cells group on the HOME tab



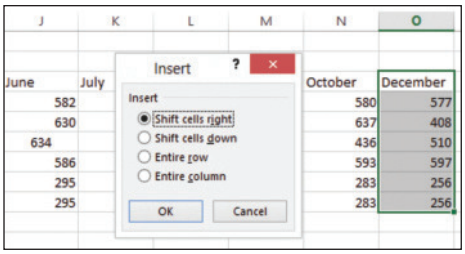
Another Way

You can right-click in a cell and select Insert from the shortcut menu to open the Insert dialog box.

4. Type **590** and press **Enter**.
5. Select cells **O3:O9**.
6. On the HOME tab, in the Cells group, click the **Insert** button arrow and then select **Insert Cells**.
7. In the Insert dialog box, ensure the **Shift cells right** option is selected, as shown in Figure 6-3. Click **OK**.

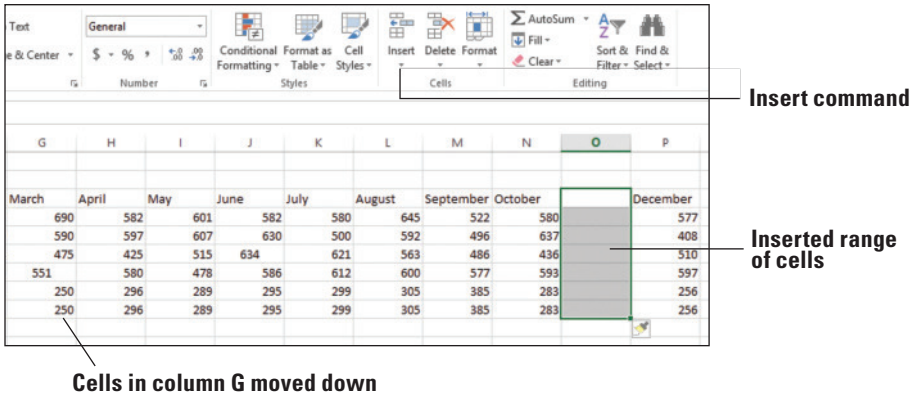
Figure 6-3

The Insert dialog box



8. Notice that the cells formerly in O3:O9 shift one cell to the right. The worksheet should look similar to Figure 6-4.

Figure 6-4
The worksheet after inserting cells



CERTIFICATION READY? 2.1.6

How do you insert cells into a worksheet?

9. In cell O3, type **November**.
10. Enter the following numbers in cells O4 through O9:
    480
    502
    446
    577
    302
    302
11. SAVE the workbook to your Lesson 6 folder as ***06 Patient Visits Insert Delete Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Additions and changes are common activities in Microsoft Office Excel 2013 workbooks. After creating and saving an Excel workbook that tracks the number of patients treated monthly, the Contoso administrative assistant discovered that corrections were needed and additional data had to be added. In the previous exercise, you made the corrections and additions. You'll use the same worksheet later in this lesson to determine whether to hire a nurse practitioner based on the average number of hours worked by employees.

When you click the Insert command arrow in the Cells group on the HOME tab, the menu indicates you can easily insert cells, worksheet rows, worksheet columns, or even a new worksheet into a workbook.

If you click the Insert button in the Cells group, a blank cell is inserted and, by default, the existing cells move down in the column. If, however, you click the Insert button arrow and select Insert Cells, the Insert dialog box shown in Figure 6-3 opens, and you can choose to shift cells to the right or down, insert a row, or insert a column in a worksheet.

Deleting Cells from a Worksheet

When you delete cells in a worksheet, you remove one or more cells, forcing other cells to move up or to the left.

STEP BY STEP Delete Cells from a Worksheet

Another Way
You can right-click in a cell and select Delete from the shortcut menu to open the Delete dialog box.

GET READY. USE the workbook you modified in the previous exercise.

1. Click cell **P7** to make it the active cell.
2. On the HOME tab, in the Cells group, click the **Delete** button arrow, and then select **Delete Cells**.

3. In the Delete dialog box, select the **Shift cells left** option and click **OK**. The content in cell Q7 shifts to the left and appears in cell P7.
4. Highlight the range **A8:P8**.
5. Right-click the selection, which is a duplicate of the next row of data, and select **Delete** from the shortcut menu.
6. In the Delete dialog box, ensure **Shift cells up** is selected and click **OK**.
7. To delete a range of cells in a column, highlight the range **D3:D8**, and on the HOME tab, in the Cells group, click the **Delete** button arrow and then select **Delete Cells**. Ensure **Shift cells left** is selected, and click **OK**. The worksheet should look similar to Figure 6-5.

CERTIFICATION READY? 2.1.6

How do you delete a cell from a worksheet?

Figure 6-5

The worksheet after deleting cells

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Contoso, Ltd.														
2															
3	Last Name	First Name	Job Title	January	February	March	April	May	June	July	August	September	October	November	December
4	Carey	Cynthia	Physician	602	605	690	582	601	582	580	645	522	580	480	577
5	Garcia	Debra	Physician	579	550	590	597	607	630	500	592	496	637	502	408
6	Laszlo	Rebecca	Physician	604	594	475	425	515	634	621	563	486	436	446	510
7	Wilson	Dan	Physician	575	325	551	580	478	586	612	600	577	593	577	600
8	Koska	Tomas	PA	326	311	250	296	289	295	299	305	385	283	302	256
9															

8. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

When you click the arrow below the Delete command in the Cells group on the HOME tab, notice that you can delete a cell, a worksheet row, a worksheet column, or an entire worksheet.

Deleting a cell is not the same as clearing a cell's content, which you learned about in Lesson 2, "Working with Microsoft Excel 2013." Think of an Excel worksheet being similar to several stacks of boxes. The boxes are lined up alongside one another and on top of one another to form a grid. The open side of every box is facing you. You can take contents out of a box, thus emptying the box, but the box still remains in the stack. This is equivalent to clearing a cell's content. The same principle applies when you press Delete on the keyboard—you're simply removing the cell's content. However, when you pull a box out of the stack, the entire box is gone. This is the same as deleting a cell using the Delete Cells command.

Cross Ref

For more information about clearing a cell's content, refer to Lesson 2.

MANUALLY FORMATTING CELL CONTENTS

Bottom Line

Excel provides many different tools to help you format cell content. Applying formatting can make your worksheets easier to understand, draw attention to important information, and provide a professional touch. The tools you need to make your worksheets look outstanding are located in various groups on the ribbon's HOME tab.

Aligning and Indenting Cell Contents

Excel enables you to align text and numbers horizontally and vertically. To **align** means to arrange in a line or bring into alignment. Horizontal alignment includes left, right, and center. Vertical alignment includes top, middle, and bottom. You can use Alignment commands in the Alignment group on the HOME tab or commands in the Format Cells dialog box to change the alignment of cell contents. Indentation moves cell contents closer to the right border of a cell.

STEP BY STEP Align Cell Contents

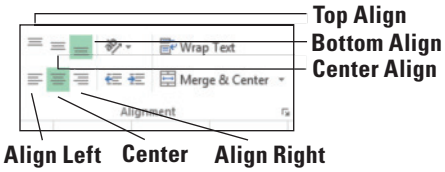
GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***06 Patient Visits Format Cells*** data file for this lesson.
2. Select **A3:O3**.

Troubleshooting Manual formatting is applied only to selected cells. Therefore, you need to select the cell or a range of cells before applying the formatting.

3. On the HOME tab, in the Alignment group, click the **Center** button, as shown in Figure 6-6. The column labels are now horizontally centered.

Figure 6-6
The Alignment buttons



CERTIFICATION READY? 2.2.2

How do you align cell content in a worksheet?

4. Select **D4:O8**, and then on the HOME tab, in the Alignment group, click the **Align Right** button. All numbers in the months columns are now right-aligned.
5. SAVE the workbook to your Lesson 6 folder as ***06 Patient Visits Format Cells Solution***.

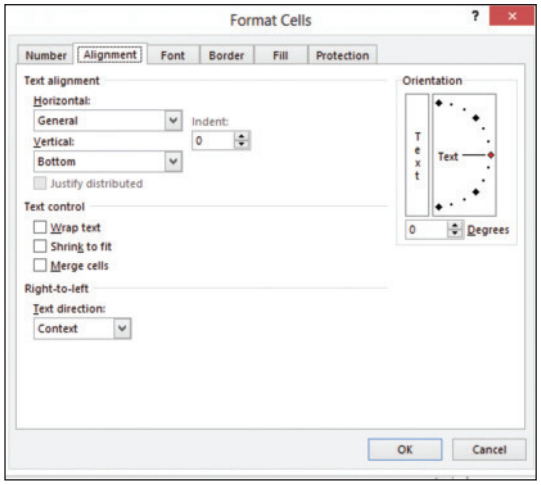
PAUSE. LEAVE the workbook open to use in the next exercise.

By default, when you enter alphabetic characters or alphabetic characters combined with numbers or symbols, the cell content is left-aligned horizontally, which means it lines up along the left side of the cell. When you enter numbers, the content is right-aligned—that is, it lines up with the right side of the cell. When you center content, it lines up with the midpoint of a cell.

Another Way
You can access the Format Cells dialog box by right-clicking in a cell or on a column or row label and selecting Format Cells.

Vertical alignment affects the location of content vertically within a cell. Your options in the Alignment group on the HOME tab are Top Align, Middle Align, and Bottom Align. You can also select Justify or Distributed, which are available in the Format Cells dialog box, shown in Figure 6-7. To access the dialog box, click the Dialog Box Launcher in the lower-right corner of the Alignment group on the HOME tab.

Figure 6-7
The Format Cells dialog box



The following describes each type of vertical alignment:

- **Top (or Top Align):** The top line of text appears at the top of the cell.
- **Center (or Middle Align):** Text is centered halfway between the top and bottom of the cell.
- **Bottom (or Bottom Align):** Text appears at the bottom of the cell. This is the default vertical alignment.
- **Justify:** Text is spread evenly throughout the cell. Excel will wrap text and automatically adjust the row height, if necessary.
- **Distributed:** Text is spread evenly between the top of the cell and the bottom, separated by blank space.

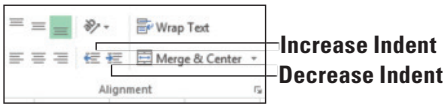
STEP BY STEP Indent Cell Contents

Another Way
You can press the Alt key and press H, and then press 6 to indent a cell's content.

GET READY. USE the workbook you saved in the previous exercise.

1. Select C4:C8.
2. On the HOME tab, in the Alignment group, click the Increase Indent button, as shown in Figure 6-8. The cell content moves toward the right cell border.

Figure 6-8
Indentation button options



3. Click the Decrease Indent button. The cell content moves back toward the left cell border.

PAUSE. LEAVE the workbook open to use in the next exercise.

Indenting data in an Excel worksheet is often performed on subordinate text to enhance readability.

Changing Text Orientation

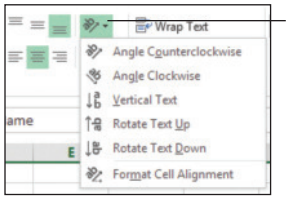
Changing the orientation of text can help you fit long column or row headings into a small space without changing the font size or column width. You can find the Orientation tool in the Alignment group on the HOME tab.

STEP BY STEP Change Text Orientation

GET READY. USE the workbook from the previous exercise.

1. Select A3:O3.
2. Click the Orientation button to open the menu, as shown in Figure 6-9.

Figure 6-9
The Orientation menu



3. Select **Angle Counterclockwise**. The column heading labels appear angled from lower left to upper right within each cell.
4. Click the **Orientation** button, and select **Angle Clockwise**. The column heading labels appear angled from upper left to lower right.
5. Click the **Orientation** button, and select **Vertical Text**. The column heading labels appear in a vertical line from top to bottom.
6. Click the **Orientation** button, and select **Rotate Text Up** and then **Rotate Text Down** to see how these settings affect the text.
7. Click the **Orientation** button, and select **Format Cell Alignment**. In the Format Cells dialog box, in the Degrees box, enter **0** and click **OK**. The column heading labels return to their original orientation.

PAUSE. LEAVE the workbook open to use in the next exercise.

Choosing Fonts and Font Sizes

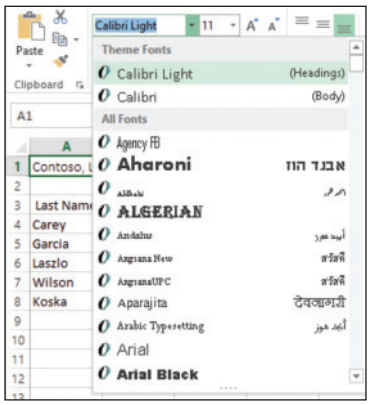
A **font** is a set of text properties that affect the typeface, size, and similar aspects of text. The default, or predefined, font for ordinary text in Excel 2013 is Calibri, 11 point. You can change the font for a selected cell, a range of cells, columns, rows, and even for specific characters within a cell. To change the font, select a new font in the Font menu in the Font group on the HOME tab. You can also change the size in the Font Size box or click Increase Font Size or Decrease Font Size until the size you want is displayed in the Font Size box.

STEP BY STEP Choose Fonts and Font Sizes

GET READY. USE the workbook from the previous exercise.

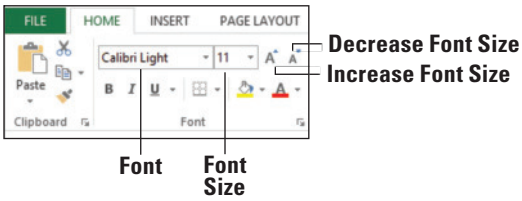
1. Click **A1**.
2. On the HOME tab, in the Font group, open the **Font** menu and select the first option under Theme Fonts at the top, **Calibri Light**, as shown in Figure 6-10. Only the text in cell A1 changes to the new font.

Figure 6-10
The Font menu



3. With cell A1 still selected, open the **Font Size** menu indicated in Figure 6-11. Select **18**. The font size of the text changes to 18 point.

Figure 6-11
The font-related options in the Font group



CERTIFICATION READY? 2.2.3

How do you change fonts and font sizes in a worksheet?

4. Select **A3:O3** and from the Font list, select **Arial**.
5. With A3:O3 still selected, change the Font Size to **10**. The column heading labels are now in Arial 10-point.
6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Excel provides many fonts, such as Arial, Calibri, and Times New Roman, in the Font menu. To improve the overall design of a worksheet, the font size is usually enlarged for titles and labels.

Font size is measured in points. Each time you click Decrease Font Size or Increase Font Size, the size changes by a set amount that matches the size options on the Font Size list. Points refer to the measurement of the height of the characters in a cell. One point is equal to 1/72 inch.

In the Excel Options dialog box (select File > Options), on the General page, you can change the default font used in all new workbooks.

Troubleshooting

If you choose a different default font and/or font size, that font is used only in workbooks you create after you change the default and restart Excel. Existing workbooks are not affected.

Whenever you select text, cells, rows, or columns for formatting, you can use the Mini toolbar, shown in Figure 6-12, to apply selected formatting features. The **Mini toolbar** is a formatting tool that appears above or below the shortcut menu when you right-click a cell. This unique toolbar provides the most commonly used formatting commands. Unlike the Quick Access Toolbar, which can be customized, you cannot customize the Mini toolbar.

Figure 6-12
The Mini toolbar

Cross Ref

For more information about the Quick Access Toolbar, refer to Lesson 3, "Using Office Backstage."

Changing Font Color

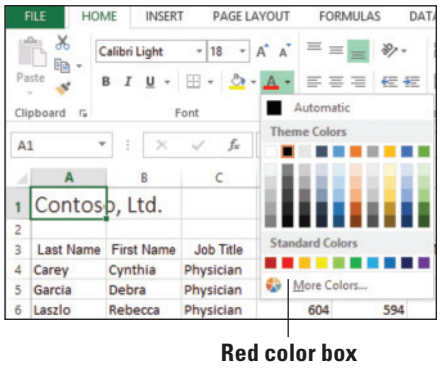
Excel enables you to pick from thousands of colors to apply to data in worksheets. Open the Font Color menu in the Font group on the HOME tab to work with theme colors and the standard color palette, or click More Colors to access a much wider selection of colors.

STEP BY STEP Change Font Color

GET READY. USE the workbook you saved in the previous exercise.

1. Click cell **A1**.
2. Open the **Font Color** menu, as shown in Figure 6-13, and under Standard Colors, click the **Red** color box. The text Contoso, Ltd. now has a red font color.

Figure 6-13
The Font Color palette in the Font group



3. Select **A3:O3**, open the **Font Color** menu, and under Standard Colors (third from the right), click the **Blue** color box.
4. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

The most recently applied color appears on the Font Color button. To apply that color, make a selection and click Font Color. To apply a different text color, click the arrow next to the Font Color button. You can choose a theme color or a standard color. You can also click More Colors to open the Colors dialog box, in which you can choose from additional standard colors or create colors to your own specifications.

Applying Special Character Attributes

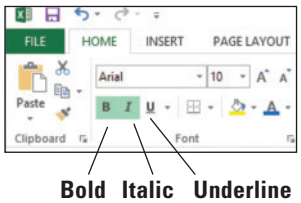
An **attribute** is a formatting characteristic, such as bold, italic, or underlined text. You can apply character attributes in Excel by selecting the data to be affected and clicking a button in the Font group on the HOME tab.

STEP BY STEP Apply Special Character Attributes

GET READY. USE the workbook you saved in the previous exercise.

1. Select **A3:O3**.
2. In the Font group, click the **Bold** button, and then click the **Italic** button, as shown in Figure 6-14. The column labels appear in bold and italics.

Figure 6-14
The Bold, Italic, and Underline buttons in the Font group



Another Way

You can press Ctrl + B to apply boldface, Ctrl + I to apply italics, or Ctrl + U to apply underlining to selected text.

3. Select **A4:B8** and click the **Bold** button. The first and last names are now bolded.
4. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

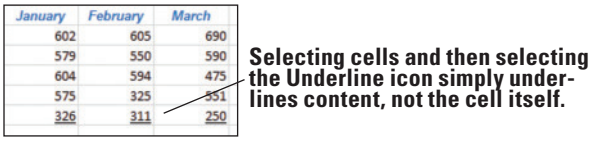
Special character attributes provide visual appeal beyond changing the font and font size. You can also call attention to specific data by applying these special characteristics.

To apply underlining, click the Underline button in the Font group. You can also click the arrow next to the Underline button and select Double Underline from the list.

When you apply underlining to cells, only the cell contents appear underlined, as shown in Figure 6-15. To create the appearance of a continuous rule, or underline, across the bottom of a cell, you need to apply a border. You'll learn about borders later in this lesson.

Figure 6-15

Underlined cells



Filling Cells with Color

When formatting worksheets, you'll find you often want to apply a colored shading, or highlighting, to the background of cells to make them stand out from the rest of the cells around them. Use the Fill Color tool in the Font group on the HOME tab to achieve this type of highlighting.

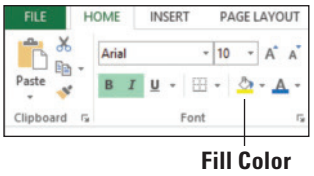
STEP BY STEP Fill Cells with Color

GET READY. USE the workbook you saved in the previous exercise.

1. Select **A3:O3**.
2. In the Font group, click the **Fill Color button arrow**, as shown in Figure 6-16. The Theme Colors and Standard Colors palettes appear.

Figure 6-16

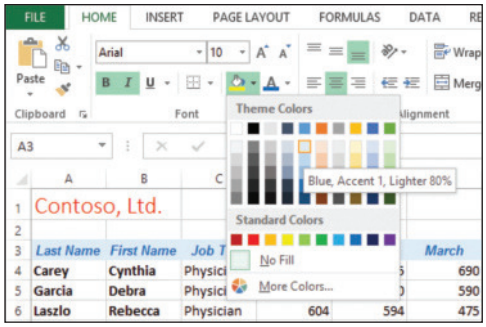
The Fill Color button in the Font group



3. Select the **Blue, Accent 1, Lighter 80%** color box, as shown in Figure 6-17. A light blue background is applied to the column heading row.

Figure 6-17

The Blue, Accent 1, Lighter 80% color box in the Fill Color tool



CERTIFICATION READY? 2.2.7

How do you apply a background fill color, or highlighting, to cells in a worksheet?

4. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

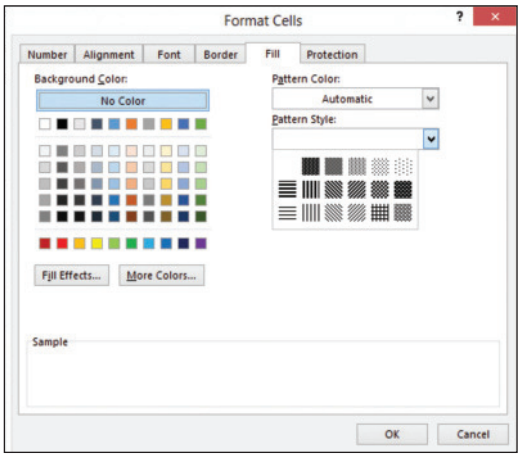
No Fill (clear) is the default background color. The color palette you used to apply font color is also used for background color.

Much like selecting a font color, after you select a color and apply it to a cell's background, the Fill Color button takes on that color. To apply the color shown on the Fill Color button, simply make a selection and click the button. To apply a different fill color, click the arrow next to Fill Color and apply either a theme color or a standard color. You can also click More Colors to open the Colors dialog box and custom blend colors.

You can apply a pattern effect to cells as well as a background color. To do so, first select the range of cells to which you want to apply a background color with fill effects, then click the Font group's Dialog Box Launcher. The Format Cells dialog box opens. Click the Fill tab. As shown in Figure 6-18, make a selection in the Pattern Style box to add a pattern to the background color.

Figure 6-18

Add a pattern to a cell's background color



Applying Number Formats

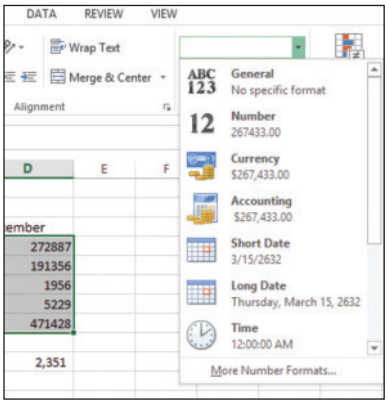
Normally, values you enter into cells are unformatted—they consist of a string of numerals. You should format the numbers so they are easier to read or are consistent in terms of the number of decimal places shown. You can use tools in the Number group on the HOME tab to apply a wide variety of number formats, from currency to dates and times to scientific notation.

STEP BY STEP Apply Number Formats

GET READY. With Excel running, perform these actions:

1. OPEN the ***06 Contoso Revenue*** data file for this lesson.
2. Ensure that **Sheet1** is the active sheet.
3. Select **B4:D8**. This data should be formatted as General, without commas or decimal places.
4. On the HOME tab, in the Number group, open the **Number Format** menu as shown in Figure 6-19.

Figure 6-19
The Number Format menu

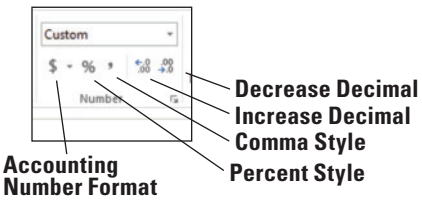


Another Way

You can also apply number formats using the Format Cells dialog box. Just right-click a cell or range of cells and select Format Cells from the shortcut menu. In the Format Cells dialog box, click the Number tab.

5. Select **Currency**. The numbers are now formatted as dollars, with two decimal places to represent cents.
6. With B4:D8 still selected, in the Number Format menu, select **Accounting**. This format left-aligns the dollar sign in each cell.
7. In the Number group, click the **Decrease Decimal** button twice to display no decimal places. The Increase Decimal and Decrease Decimal buttons are shown in Figure 6-20. The numbers are now rounded to whole dollars.

Figure 6-20
The buttons in the Number group



8. Click in a blank cell, such as **A11**.
9. Click **Sheet2**.
10. Select **B6:B11**.
11. In the Number group, click the **Comma Style** button. Notice that the numbers are formatted with a thousands separator and two decimal places but no dollar sign.
12. With B6:B11 still selected, in the Number group, click the **Accounting Number Format** button, and then click the **Decrease Decimal** button twice. These actions make the current range consistent with the number format on Sheet1.
13. Select **C6:C11**.
14. In the Number Format menu, select **Short Date**. The dates are now displayed in the mm/dd/yyyy format.

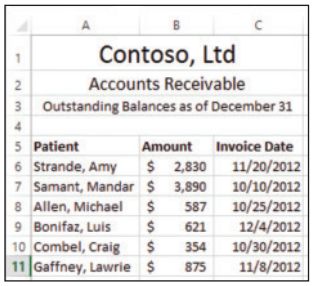
CERTIFICATION READY? 2.2.6

How do you apply number formatting in a worksheet?

15. Manually decrease the width of column C to eliminate extra space, similar to Figure 6-21.

Figure 6-21

Sheet2 after applying number and date formats and decreasing the width of column C



	A	B	C
1	Contoso, Ltd		
2	Accounts Receivable		
3	Outstanding Balances as of December 31		
4			
5	**Patient**	**Amount**	**Invoice Date**
6	Strande, Amy	$ 2,830	11/20/2012
7	Samant, Mandar	$ 3,890	10/10/2012
8	Allen, Michael	$ 587	10/25/2012
9	Bonifaz, Luis	$ 621	12/4/2012
10	Combel, Craig	$ 354	10/30/2012
11	Gaffney, Lawrie	$ 875	11/8/2012

16. SAVE the workbook to your Lesson 6 folder as ***06 Contoso Revenue Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Formatting a number does not affect the value in the cell; formatting simply changes the appearance of the number.

The Number Format menu contains several options that let you quickly apply common number formats. When you click one of these options, the active cell takes on the specified number format. You also can select a range of cells (or even an entire row or column) before clicking a number format option. If you select more than one cell, Excel applies the number format to all of the selected cells. Table 6-1 summarizes the various formats available in the Number Format menu.

Table 6-1

Excel number format preset options available in the Number Format menu

Number Format	Description
General	This is the default format that Excel applies when you enter text or a number in a cell.
Number	This format is used for the general display of numbers, with two decimal places by default.
Currency	This format is used for general monetary values and displays the default currency symbol with two decimal places.
Accounting	This format is also used for monetary values. Currency symbols and decimal points are aligned in this format.
Short Date	This format displays days, months, and years in the mm/dd/yyyy style by default.
Long Date	This format displays dates in a long format, such as Sunday, January 10, 2014.
Time	This format applies a single format: 12:00:00 AM. If you want to choose another time format, you must use the Format Cells dialog box.
Percentage	This format displays the number with a percent sign and two decimal places.
Fraction	This format displays the number as a fraction.
Scientific	This format displays numbers in exponential notation (with an E): for example, 2.00E+05 = 200,000; 2.05E+05 = 205,000.

In most cases, the number formats provided in the Number Format menu are adequate. However, you may occasionally want more control over how your values appear. Excel offers control over number formats through the Format Cells dialog box.

The Number tab of the Format Cells dialog box displays 12 categories of number formats from which to choose, most of which are also available from the Number Format menu. However, when you select a category from the list box in the Format Cells dialog box, the right side of the tab changes to display options.

For example, the Number category has three options that you can control:

- The number of decimal places to display
- Whether to use a thousand separator
- How to display negative numbers

Notice that the Negative Numbers list box has four choices, two of which display negative values in red. These choices change depending on the number of decimal places and whether you choose to separate thousands. Also, notice that a Sample section near the top of the dialog box previews how the active cell will appear with the selected number format. After you make your choices, click OK to apply the number format to all of the selected cells.

The number format categories that are unique to the Number tab in the Format Cells dialog box are described in Table 6-2.

Table 6-2
Additional Number format categories

Number Format	Description
Special	Contains additional number formats specific to your country. In the United States, there are four (Zip Code, Zip Code+4, Phone Number, and Social Security Number); in Canada, there are two (Phone Number and Social Insurance Number); in most other countries, there are none.
Custom	Enables you to define custom number formats that are not included in any of the other categories.
Text	When applied to a value, causes Excel to treat the value as text (even if it looks like a number). This feature is useful for items such as part numbers.

Wrapping Text in a Cell

When a cell is formatted to **wrap** text, data that's too long to display within the cell's width automatically displays on the next line within the cell. Wrapped text also increases row height automatically. If you later change the column width, the text wrapping and row height adjust automatically.

STEP BY STEP Wrap Text in a Cell

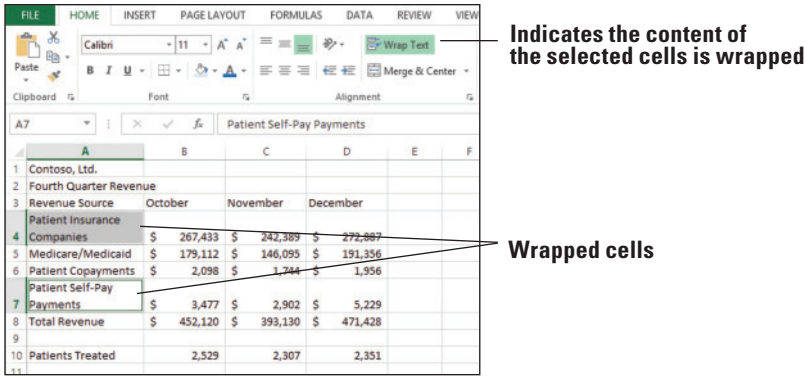
CERTIFICATION READY? 2.2.5

How do you wrap text in a cell?

GET READY. USE the workbook you saved in the previous exercise.

1. Click **Sheet1**. Notice that the content in two cells in column A cannot be fully displayed because of length.
2. Click **A4**, and then hold down the **Ctrl** key and click **A7**. Both cells—A4 and A7—are selected.
3. On the HOME tab, in the Alignment group, click the **Wrap Text** button. The text in both cells wraps to a second line without affecting the column width, as shown in Figure 6-22. Notice that the Wrap Text button takes on a green background, indicating that the text in the selected cells is wrapped.

Figure 6-22
The formatted worksheet with text wrapping



4. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

You can remove text wrapping by selecting the appropriate cell or cells and clicking the Wrap Text button again.

Troubleshooting If you choose a different default font and/or font size, that font is used only in workbooks you create after you change the default and restart Excel. Existing workbooks are not affected.

Merging Cells and Splitting Merged Cells

Merging is a useful tool when combining data from other sources, and as a means of centering a heading across multiple columns. A **merged cell** combines two or more cells into a single cell. Splitting cells, or unmerging them, separates previously merged cells. The Merge & Center button in the Alignment group on the HOME tab provides several merge commands and the Unmerge Cells command.

STEP BY STEP — Merge and Split Cells

GET READY. USE the workbook you saved in the previous exercise.

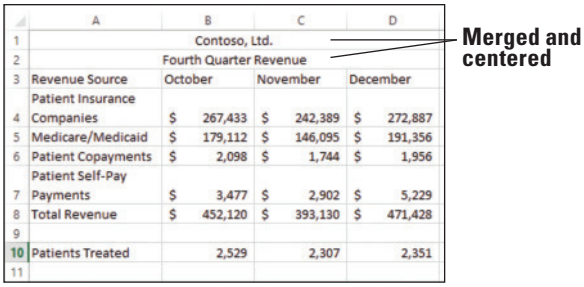
1. On Sheet1, select A1:D1.
2. On the HOME tab, in the Alignment group, click the main part of the Merge & Center button. The company name remains in a single cell, which is now centered across the columns.
3. Select A2:D2.
4. On the HOME tab, in the Alignment group, open the Merge & Center menu. Select Merge & Center. The heading remains in a single cell, which is now centered across the columns. This step has the same effect on A2:D2 as Step 2 had on A1:D1.
5. Select A3:D3.
6. From the Merge & Center menu, click Merge & Center.
7. Read the error message that appears and click OK.
8. Only the heading in the first column remains, which is not the effect we want. Press Ctrl + Z to undo the last change and restore the headings. See Figure 6-23.

CERTIFICATION READY? 2.2.1

How do you merge two or more cells in a worksheet?

Figure 6-23

The formatted worksheet with cells in the first two rows merged and centered



	A	B	C	D
1	Contoso, Ltd.			
2	Fourth Quarter Revenue			
3	Revenue Source	October	November	December
4	Patient Insurance Companies	$ 267,433	$ 242,389	$ 272,887
5	Medicare/Medicaid	$ 179,112	$ 146,095	$ 191,356
6	Patient Copayments	$ 2,098	$ 1,744	$ 1,956
7	Patient Self-Pay Payments	$ 3,477	$ 2,902	$ 5,229
8	Total Revenue	$ 452,120	$ 393,130	$ 471,428
9				
10	Patients Treated	2,529	2,307	2,351
11				

9. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

A merged cell is created by combining two or more horizontally or vertically adjacent cells. When you merge cells, the selected cells become one large cell that spans multiple columns or rows.

To split, or unmerge, cells right after merging them, press Ctrl + Z. Otherwise, open the Merge & Center menu and select Unmerge Cells to split merged cells. You can split cells that have been merged into separate cells again, but you cannot split a single worksheet cell that has not been merged.

Placing Borders around Cells

You can use borders to enhance a worksheet's visual interest and to make it easier to read. You can either apply Excel's predefined border styles, or you can customize borders by specifying a line style and color of your choice.

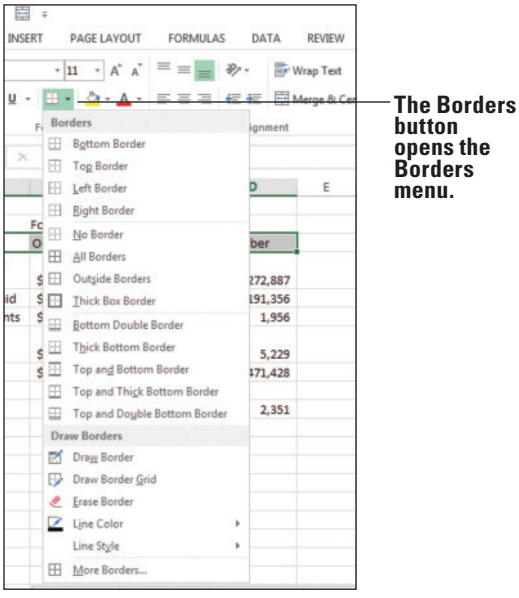
STEP BY STEP **Place Borders around Cells**

GET READY. USE the workbook you saved in the previous exercise.

1. On Sheet1, select **A3:D3**.
2. On the HOME tab, in the Font group, click the **Borders** button arrow to open the Borders menu, as shown in Figure 6-24.

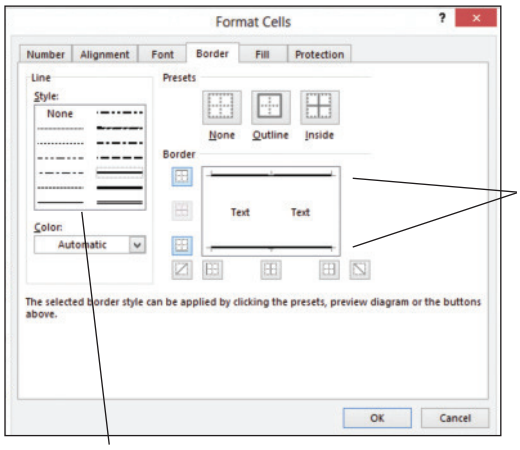
Figure 6-24

The Borders menu in the Font group



3. Select **Top and Bottom Border**. The selected text now has a top and bottom border.
4. With **A3:D3** still selected, open the **Borders** menu and select **More Borders**.
5. In the Format Cells dialog box, click the **Border** tab, if necessary.
6. Click a thicker line weight, such as the fifth line in the second column under Style. Then click the top and bottom border lines shown in the preview to the right to apply the thicker line. See Figure 6-25.

Figure 6-25
Applying a border option



7. Open the **Color** list and under Standard Colors, select the **Blue** color box (third from right under Standard Colors), and then click the top and bottom border lines shown in the preview to the right to apply the color. Click **OK** and then click in a blank cell so you can view the result. See Figure 6-26.

Figure 6-26
The worksheet with a colored border above and below column heading labels

	A	B	C	D
1	Contoso, Ltd.			
2	Fourth Quarter Revenue			
3	Revenue Source	October	November	December
4	Patient Insurance Companies	$ 267,433	$ 242,389	$ 272,887
5	Medicare/Medicaid	$ 179,112	$ 146,095	$ 191,356
6	Patient Copayments	$ 2,098	$ 1,744	$ 1,956
7	Patient Self-Pay Payments	$ 3,477	$ 2,902	$ 5,229
8	Total Revenue	$ 452,120	$ 393,130	$ 471,428
9				
10	Patients Treated	2,529	2,307	2,351

8. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

Borders are often used to set off headings, labels, or totals.

In the Font group, the Borders button displays the most recently used border style, and the button's name changes to that style name. Click the Border button (not the arrow) to apply that style, or you can click the arrow and choose a different border style. Click More Borders to apply a custom or diagonal border.

On the Border tab of the Format Cells dialog box, click a line style and a color. You can select a border style from the presets or create a style with the line-placement options in the Border area. To remove a border, just click the border line in the preview pane in the Format Cells dialog box.

COPYING CELL FORMATTING WITH THE FORMAT PAINTER

Bottom Line

Format Painter is a feature found in most Office applications that allows you to quickly copy formatting attributes that you have already applied and "paint" those attributes onto other text, shapes, pictures, and worksheet cells. You can use Format Painter to copy font, font size, font color, character attributes like bolding and underlining, alignment, indentation, number formats, and borders and shading. Format Painter is located in the Clipboard group on the HOME tab and on the Mini toolbar.

STEP BY STEP Use the Format Painter to Copy Formatting

GET READY. LAUNCH Excel if it is not already running.

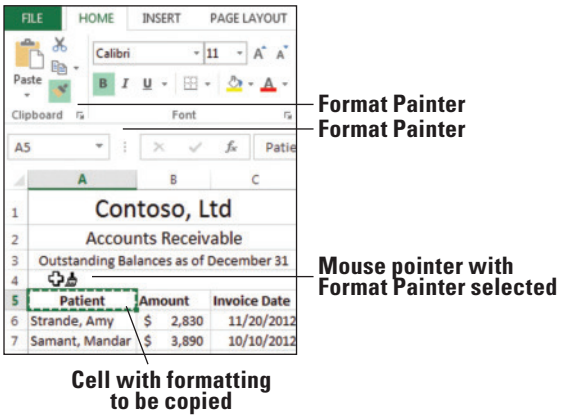
1. OPEN the ***06 Contoso Painter Paste Special*** data file for this lesson.
2. Click **Sheet2**.
3. Click in cell **A5**.
4. On the HOME tab, in the Alignment group, click the **Center** button.
5. On the HOME tab, in the Clipboard group, click the **Format Painter** button. The mouse pointer changes to a plus sign with a paint brush, as shown in Figure 6-27.

Another Way

Format Painter is available on the Mini toolbar as well as in the Clipboard group.

Figure 6-27

The Format Painter pointer



6. Drag over **B5:C5**. The formatting from A5 is applied to B5 and C5.
7. If Format Painter is still active, click the **Format Painter** button again or press **Esc** to turn off the Format Painter.
8. SAVE the workbook to your Lesson 6 folder as ***06 Contoso Painter Paste Special Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

CERTIFICATION READY? 2.2.4

How do you use Format Painter to copy formatting from one cell to another?

You can double-click the Format Painter if you want to apply formats to multiple selections.

UNDERSTANDING PASTE SPECIAL OPTIONS

Bottom Line

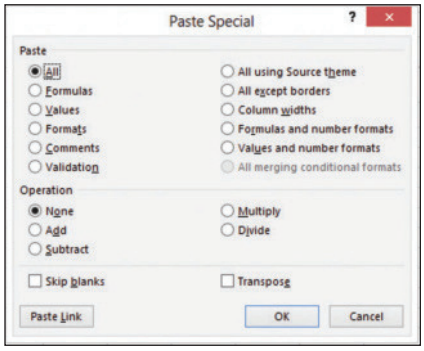
Excel gives you another tool, called **Paste Special,** that enables you to control specifically what you want to paste after using the Copy or Cut command, such as cell content, formulas, values, formatting, and much more. Paste Special is available in the Clipboard group on the HOME tab, or in the shortcut menu that appears after right-clicking a cell.

STEP BY STEP Understand Paste Special Options

GET READY. USE the workbook you saved in the previous exercise.

1. Ensure you are on Sheet2.
2. In cell A12, type **Jacobsen, Lola**.
3. Select **B11:C11**.
4. Press **Ctrl + C** to copy the selection to the Clipboard.
5. Right-click in cell **B12** and select **Paste Special** from the shortcut menu. The Paste Special dialog box opens, as shown in Figure 6-28.

Figure 6-28
The Paste Special dialog box



6. Select **Formats** and click **OK**. Only the formatting from B11:C11 is applied to B12:C12.
7. In B12, type **1534** and press **Enter**. The content is formatted the same as B11.
8. In C12, type **12/15/12** and press **Enter**. The content takes on the same date format as C11.
9. Click in **A13** and type the label **Total**.
10. Click in **B13**, and on the HOME tab, in the Editing group, click the **AutoSum** button, and press **Enter**. The values in B6:B12 are totaled.
11. Click in **B13** and press **Ctrl + C** to copy the selection to the Clipboard.
12. Right-click in **B14**, select **Paste Special**, in the Paste Special dialog box, select **Values**, and then click **OK**. Press **Esc** to cancel the moving border in cell B13. Only the value of the formula in B13 was copied to B14, not the formula itself or any cell formatting.
13. Delete the content in cell **B14**. See Figure 6-29.

Figure 6-29
The worksheet after applying Paste Special

	A	B	C
1	Contoso, Ltd		
2	Accounts Receivable		
3	Outstanding Balances as of December 31		
4			
5	Patient	Amount	Invoice Date
6	Strande, Amy	$ 2,830	11/20/2012
7	Samant, Mandar	$ 3,890	10/10/2012
8	Allen, Michael	$ 587	10/25/2012
9	Bonifaz, Luis	$ 621	12/4/2012
10	Combel, Craig	$ 354	10/30/2012
11	Gaffney, Lawrie	$ 875	11/8/2012
12	Jacobsen, Lola	$ 1,534	12/15/2012
13	Total	$ 10,691	

14. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

With Paste Special, you select a cell or range of cells with the content or formatting you want to copy, issue the Copy or Cut command, and then select Paste Special. Using either the buttons in a menu or the Paste Special dialog box, you can choose what you want to paste into a different cell or range. Some of the paste options include formulas, only the values displayed as a result

of formulas, cell formatting, column widths, everything except cell borders, values and number formats, and links.

Cross Ref Lesson 7, "Formatting Worksheets," covers transposing rows and columns using the Paste Special command.

FORMATTING CELLS WITH STYLES

Bottom Line

Excel provides a gallery of preset cell styles you can apply to greatly enhance the appeal of your worksheets. You can duplicate and modify styles to create your own custom styles, and you can easily remove styles if you no longer want to use that particular formatting.

Applying a Cell Style

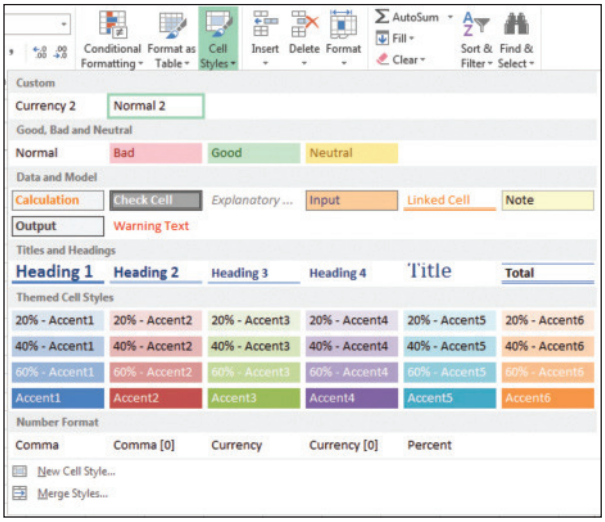
A **style** is a set of formatting attributes that you can apply to a cell or range of cells more easily than by setting each attribute individually. To apply a cell style to an active cell or range, click Cell Styles in the Styles group on the HOME tab, then choose the cell style that you want to apply. You can apply more than one style to a cell or range.

STEP BY STEP **Apply Cell Styles**

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***06 Contoso Cell Styles*** data file for this lesson.
2. Click Sheet1.
3. Select cell A1.
4. On the HOME tab, in the Styles group, open the Cell Styles menu. The Cell Styles gallery appears, as shown in Figure 6-30.

Figure 6-30
The Cell Styles gallery



5. In the Titles and Headings section, select the Heading 1 style to apply it to the first cell of the worksheet.
6. Select cell A2.
7. Open the Cells Styles gallery and in the Themed Cell Styles section, select Accent1. A blue background with white text is applied to cell A2.
8. Select A8:D8.
9. Open the Cells Styles gallery and in the Titles and Headings section, select Total. A thin blue border appears above A8:D8, and a double underline appears under the range of cells. Select a blank cell to see the results. See Figure 6-31.

Figure 6-31
The worksheet with cell styles applied

	A	B	C	D
1	Contoso, Ltd.			
2	Fourth Quarter Revenue			
3	Revenue Source	October	November	December
4	Patient Insurance Companies	$ 267,433	$ 242,389	$ 272,887
5	Medicare/Medicaid	$ 179,112	$ 146,095	$ 191,356
6	Patient Copayments	$ 2,098	$ 1,744	$ 1,956
7	Patient Self-Pay Payments	$ 3,477	$ 2,902	$ 5,229
8	**Total Revenue**	**$ 452,120**	**$ 393,130**	**$ 471,428**
9				
10	Patients Treated	2,529	2,307	2,351

CERTIFICATION READY? 2.2.8

How do you apply cell styles to one or more cells in a worksheet?

10. SAVE the workbook to your Lesson 6 folder as ***06 Contoso Cell Styles Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Style attributes include fonts and font sizes, number formats, and borders and shading. Excel has several predefined styles that you can apply; you can also modify or duplicate a cell style to create a custom cell style.

When you point to defined styles in the Cell Styles gallery, you can see the formatting that will be used when you apply each style. This feature allows you to assess the formatting without actually applying it.

Experiment with combining styles to achieve your desired effect. For example, you can click a themed cell style, which will apply shading to the cell. Then, you can click Cell Styles again and click Heading 1, which applies a larger font size, bold, and a thick bottom border.

If you are not satisfied with a style you apply, you can use the Undo command immediately after applying the style, remove the style by applying the Normal style, or apply another style to the cell or range.

Customizing Cell Styles

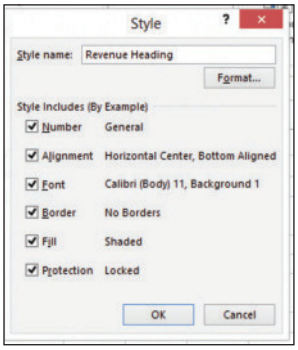
You can modify an existing cell style to create a new custom style. When doing so, you can either add or delete style attributes.

STEP BY STEP Customize a Cell Style

USE the workbook you saved in the previous exercise.

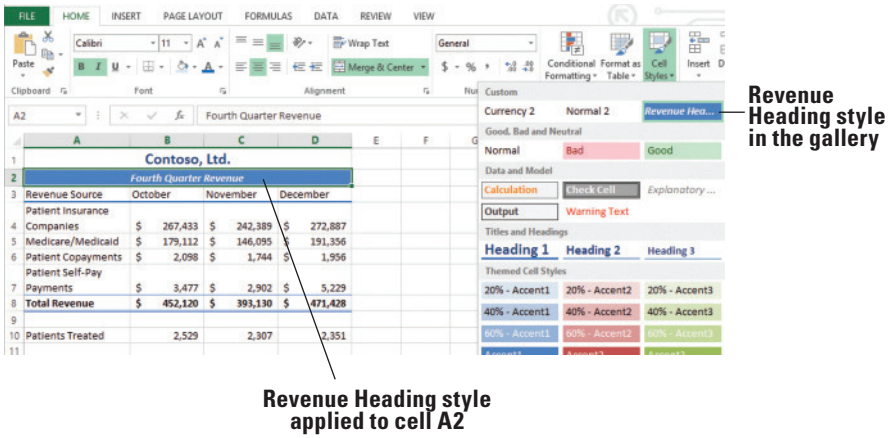
1. On Sheet1, click **A2**.
2. On the HOME tab, in the Styles group, open the **Cell Styles** menu and select **New Cell Style** near the bottom of the menu. The Style dialog box opens.
3. In the Style name text box, enter **Revenue Heading**, as shown in Figure 6-32.

Figure 6-32
The Style dialog box



4. Click the **Format** button.
5. Click the **Font** tab, in the Font style list, select **Bold Italic**, and click **OK**.
6. Click **OK** to close the Style dialog box.
7. With A2 still selected, open the **Cell Styles** menu and click **Revenue Heading** to apply the new style, as shown in Figure 6-33.

Figure 6-33
The new style applied to the worksheet cell



8. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

In this exercise, you created a new custom style by renaming (and thus duplicating) an existing cell style and then modifying the style. Your custom style was added to the Cell Styles gallery.

When creating a new style based on an existing style, you can uncheck options in the Style dialog box that you want to remove from your new style.

To simply modify an existing style, click Cell Styles in the Styles group. When the Styles gallery is displayed, right-click the cell style you want to change and select Modify. The Styles dialog box opens with the current style name displayed but not accessible. This tells you that any changes you make to the style will be made to the existing style rather than a customized style.

You can delete styles from the Cells Styles gallery. Doing so also removes the style from all cells that are formatted with it. To remove a style from the Cell Styles gallery, right-click the style in the gallery and select Delete from the shortcut menu. Although you can delete most preset styles from the Cell Styles gallery, it's not recommended.

Take Note You cannot delete the Normal cell style.

WORKING WITH HYPERLINKED DATA

Bottom Line

For quick access to related information in another file or on a web page, you can insert a hyperlink in a worksheet cell. A **hyperlink** is a shortcut of sorts that enables you to navigate to a web page or a location in another file in just one click of the mouse. Hyperlinks enable you to supplement worksheet data with additional information and resources.

Inserting a Hyperlink into a Worksheet

You can add a hyperlink to your document by right-clicking a cell and selecting Hyperlink from the shortcut menu.

STEP BY STEP Insert a Hyperlink in a Cell

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***06 Contoso Hyperlink*** data file for this lesson.
2. Click **Sheet2**.
3. Click in cell **A15**.
4. Type **Company website:** and press **Enter**.
5. Manually widen column A until all content displays properly in cell A15.
6. Right-click cell **B15** and select **Hyperlink** from the shortcut menu.
7. In the Insert Hyperlink dialog box, in the Address box, type **http://www.contoso.com/** and click **OK**. The hyperlink appears in the worksheet, as shown in Figure 6-34.

Another Way
You can open the Insert Hyperlink dialog box by clicking the Hyperlink command in the Links group on the INSERT tab.

Figure 6-34
A hyperlink inserted into a worksheet

	A	B	C
1	Contoso, Ltd		
2	Accounts Receivable		
3	Outstanding Balances as of December 31		
4			
5	Patient	Amount	Invoice Date
6	Strande, Amy	$ 2,830	11/20/2012
7	Samant, Mandar	$ 3,890	10/10/2012
8	Allen, Michael	$ 587	10/25/2012
9	Bonifaz, Luis	$ 621	12/4/2012
10	Combel, Craig	$ 354	10/30/2012
11	Gaffney, Lawrie	$ 875	11/8/2012
12	Jacobsen, Lola	$ 1,534	12/15/2012
13	Total	$ 10,691	
14			
15	Company website:	http://www.contoso.com/	

Hyperlink

CERTIFICATION READY? 1.2.2

How do I insert a hyperlink into a worksheet?

8. SAVE the workbook to your Lesson 6 folder as ***06 Contoso Hyperlink Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Using a Hyperlink

Using a hyperlink refers to clicking the link to navigate to the location that's embedded in the hyperlink.

STEP BY STEP Use a Hyperlink

GET READY. USE the workbook you saved in the previous exercise.

1. Click the hyperlink in cell **B15**. Because the hyperlink points to a website, your default web browser opens.
2. Close the browser window.

PAUSE. LEAVE the workbook open to use in the next exercise.

Clicking a hyperlink brings you to a new location. To select the cell that contains a hyperlink, click and hold the mouse.

Removing a Hyperlink from a Worksheet

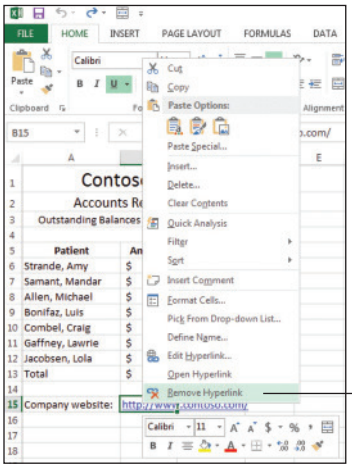
You can remove a hyperlink from a cell using the Remove Hyperlink command. Doing so does not delete the text linked to the hyperlink.

STEP BY STEP Remove a Hyperlink from a Cell

GET READY. USE the workbook you worked on in the previous exercise.

1. Right-click cell **B15** and select **Remove Hyperlink** from the shortcut menu, as shown in Figure 6-35. The hyperlink is removed from the URL, but the URL text remains.

Figure 6-35
The Remove Hyperlink menu item



2. CLOSE the workbook without saving your changes.

PAUSE. LEAVE Excel open to use in the next exercise.

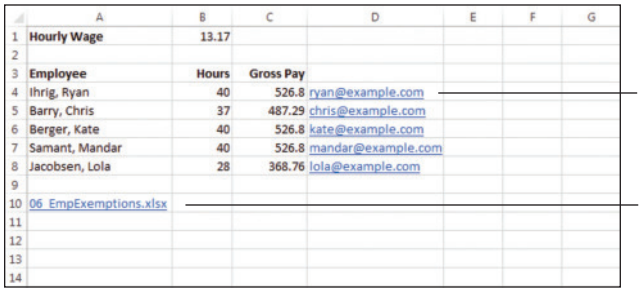
Workplace Ready

THE VERSATILITY OF HYPERLINKS

A hyperlink is typically associated with accessing a web page, but Excel provides a lot more uses for hyperlinks. For example, inserting a hyperlink composed of the name of a file lets you open the file from a worksheet. You can create a hyperlink that lets you navigate to a specific location within the current worksheet, based on a cell reference or a named range.

Want to set up a hyperlink that automatically opens an email window? Just use the E-mail Address option in the insert Hyperlink dialog box, and enter an email address and Subject line text. When you click the resulting hyperlink, your default email program opens automatically, enabling you to type a message and attach files (if you want) and then send the message.

You can insert a hyperlink directly into an Excel worksheet, or attach the hyperlink to an object, such as a shape, chart, or photo.



APPLYING CONDITIONAL FORMATTING TO CELLS

Bottom Line

The Excel conditional formatting feature enables you to apply formatting according to rules. You can apply a single rule or multiple rules, and you can use the preset rules provided by Excel or customize them for your particular needs. The Excel **Rules Manager** gives you even greater control over rules by enabling you to set the order of multiple rules, fine-tune rule settings, and more.

Applying a Specific Conditional Format

To apply a specific conditional format, use the Conditional Formatting menu in the Styles group on the HOME tab and select one of the many options provided.

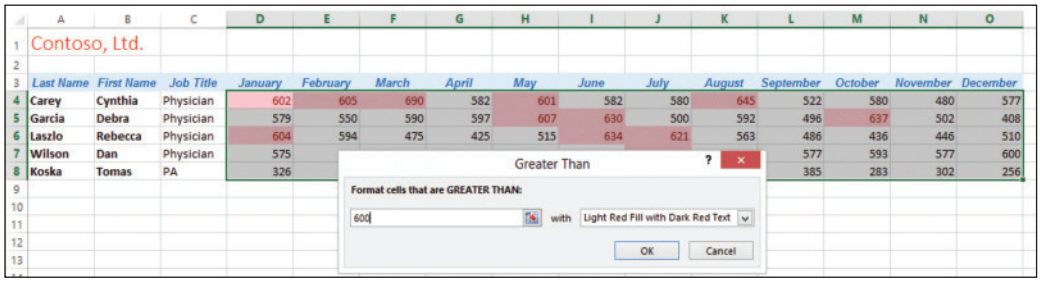
STEP BY STEP **Apply a Specific Conditional Format**

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***06 Patient Visits Conditional Formatting*** data file for this lesson.
2. Select **D4:O8**.
3. On the HOME tab, in the Styles group, click **Conditional Formatting**, and then select **Highlight Cells Rules > Greater Than**. The Greater Than dialog box appears.
4. In the Format cells that are GREATER THAN box, type **600**.
5. Leave the default fill color, as shown in Figure 6-36. Click **OK**. Cells that contain a value greater than 600 are formatted with a light red background color and a dark red text color. This data represents the months in which the physicians were seeing more than the ideal number of patients.

Figure 6-36

The Greater Than dialog box and cells displaying conditional formatting



6. SAVE the workbook to your Lesson 6 folder as ***06 Patient Visits Conditional Formatting Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

CERTIFICATION READY? 2.3.1

How do you apply a single criterion for conditional formatting?

Conditional formatting is a powerful Excel feature that enables you to specify how cells that meet a given condition should be displayed. Thus, conditional formatting means that Excel applies formatting automatically, based on established criteria.

When you analyze data, you often ask questions, such as:

- Who are the highest performing students in the gradebook?
- Which sales representatives exceeded their sales goals and in which quarters?
- In what months were revenues highest or lowest?

Conditional formatting helps answer such questions by highlighting pertinent cells or ranges of cells. You can even establish multiple conditional formatting rules for a data range.

Applying Conditional Formatting for Multiple Criteria

To see the effect of two or more criteria on a set of data, you can apply multiple conditional formatting rules one on top of the other. This exercise shows you how to set two different conditional formatting rules on the same range of data.

STEP BY STEP Apply Multiple Conditional Formatting Rules

GET READY. USE the workbook you saved in the previous exercise.

1. Select **D4:O8**.
2. On the HOME tab, in the Styles group, open the **Conditional Formatting** menu, and then select **Highlight Cells Rules > Less Than**.
3. In the Format cells that are LESS THAN box, type **300**.
4. In the drop-down menu, click the **Yellow Fill with Dark Yellow Text** option. Click **OK**. All values of less than 300 appear with a yellow background and dark yellow text color, along with values over 600 indicated by a light red background and dark red text, as shown in Figure 6-37.

Figure 6-37
The worksheet with two sets of conditional formatting applied

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Contoso, Ltd.														
2															
3	Last Name	First Name	Job Title	January	February	March	April	May	June	July	August	September	October	November	December
4	Carey	Cynthia	Physician	602	605	690	582	601	582	580	645	522	580	480	577
5	Garcia	Debra	Physician	579	550	590	597	607	630	500	592	496	637	502	408
6	Laszlo	Rebecca	Physician	604	594	475	425	515	634	621	563	486	436	446	510
7	Wilson	Dan	Physician	575	325	551	580	478	586	612	600	577	593	577	600
8	Koska	Tomas	PA	326	311	250	296	289	295	299	305	385	283	302	256

5. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

In this lesson's exercises, you have worked with data related to the number of patients treated each month at Contoso, Ltd. The chapter-opening scenario indicated that you are trying to determine whether you should hire a nurse practitioner. With both sets of conditional formatting applied, you can see at a glance which staff members see more than 600 patients or less than 300 patients in a month.

Using the Rules Manager to Apply Conditional Formats

Excel's Rules Manager enables you to choose from preset specific conditional formats that provide a visual analysis of a worksheet or selected range of data. You can apply a single rule or multiple rules, and you can modify preset rules to display formats however you like.

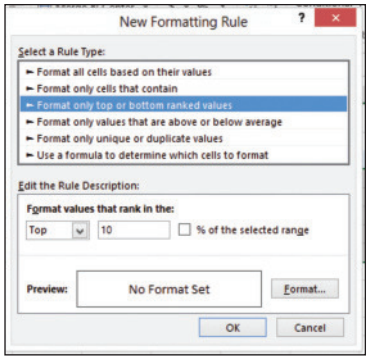
STEP BY STEP Use the Rules Manager to Apply Conditional Formats

GET READY. USE the workbook you saved in the previous exercise.

1. Select **D4:O8**.
2. On the HOME tab, in the Styles group, open the **Conditional Formatting** menu, and select **Clear Rules > Clear Rules from Selected Cells**.
3. Open the **Conditional Formatting** menu again and select **Manage Rules**. The Conditional Formatting Rules Manager dialog box appears.
4. Click the **New Rule** button. In the New Formatting Rule dialog box, select **Format only top or bottom ranked values**. The dialog box changes as shown in Figure 6-38.

Figure 6-38

The New Formatting Rule dialog box



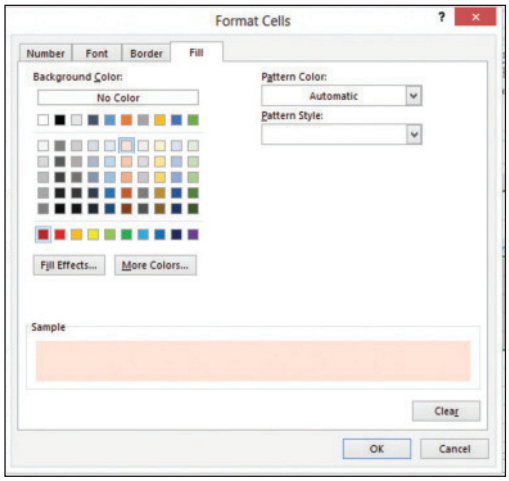
CERTIFICATION READY? 2.3.1

How do you use the Rules Manager to apply conditional formatting?

5. In the Edit the Rule Description section, click the **% of the selected range** checkbox.
6. Click the **Format** button. The Format Cells dialog box opens.
7. Click the **Fill** tab if it's not already selected, and then select the light red (pink) color box, as shown in Figure 6-39. Click **OK** twice.

Figure 6-39

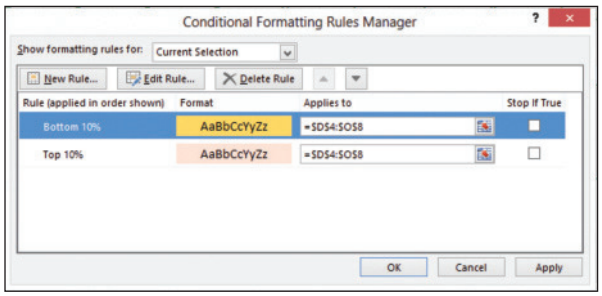
Selecting a background color for the rule



8. In the Conditional Formatting Rules Manager dialog box, click the **New Rule** button.
9. In the New Formatting Rule dialog box, select **Format only top or bottom ranked values**.
10. In the Edit the Rule Description section, in the first drop-down list on the left, select **Bottom**, and then click the **% of the selected range** checkbox.
11. Click the **Format** button.
12. In the Format Cells dialog box, click a yellow background color on the Fill tab, and then click **OK** twice. The Conditional Formatting Rules Manager dialog box should look similar to Figure 6-40.

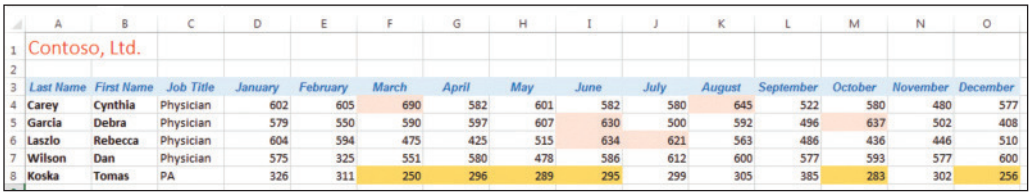
Figure 6-40

The Conditional Formatting Rules Manager dialog box with two rules configured



13. Click **OK**. The Rules Manager applies the rules to the selected cells, as shown in Figure 6-41. This view enables you to see the top 10 percent and bottom 10 percent values in the range.

Figure 6-41
The worksheet with the top 10% and bottom 10% rules applied



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Contoso, Ltd.														
2															
3	Last Name	First Name	Job Title	January	February	March	April	May	June	July	August	September	October	November	December
4	Carey	Cynthia	Physician	602	605	690	582	601	582	580	645	522	580	480	577
5	Garcia	Debra	Physician	579	550	590	597	607	630	500	592	496	637	502	408
6	Laszlo	Rebecca	Physician	604	594	475	425	515	634	621	563	486	436	446	510
7	Wilson	Dan	Physician	575	325	551	580	478	586	612	600	577	593	577	600
8	Koska	Tomas	PA	326	311	250	296	289	295	299	305	385	283	302	256

14. SAVE the workbook to your Lesson 6 folder as ***06 Patient Visits Conditional Formatting Revised Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

The Excel **Rules Manager** enables you to create, modify, apply, remove, and manage conditional formatting, including multiple criteria, all in one dialog box.

In addition, you can display the Rules Manager to see what rules are in effect for the worksheet and apply those rules at an appropriate time. From the Conditional Formatting Rules Manager dialog box, you can add new rules, edit existing rules, or delete one or all of the rules. The rules are applied in the order in which they are listed in the Rules Manager. You can apply all the rules, or you can apply specific rules to analyze the data. Formatting is visible when the Conditional Formatting Rules Manager dialog box is open. Thus, you can experiment with the formats you want to apply and the order in which they are applied.

CLEARING A CELL'S FORMATTING

Bottom Line

Although cell formatting can greatly improve the aesthetics and readability of your worksheets, sometimes you may need to remove the formatting, either to start over again or to use the data in another worksheet. Excel makes it easy to remove formatting from a single cell, a range of cells, or the entire worksheet.

STEP BY STEP **Clear a Cell's Formatting**

GET READY. USE the workbook you saved in the previous exercise.

1. Select **A3:O3**.
2. On the HOME tab, in the Editing group, open the **Clear** menu, and select **Clear Formats**. The formatting for the range A3:O3 is removed.
3. In the upper-left corner of your worksheet, at the intersection of the column and row headings, click the **Select All** button, or press **Ctrl+A**.
4. From the Clear menu, click **Clear Formats**. All worksheet formatting disappears.
5. Close the workbook without saving your changes.

CLOSE Excel.

As you saw in this exercise, clearing formatting from cells or an entire worksheet does not affect the text, numbers, or formulas in the worksheet.

SKILL SUMMARY

In this lesson you learned how:	Exam Objective	Objective Number
To insert and delete cells.	Insert and delete cells.	2.1.6
To manually format cell contents.	Modify cell alignment and indentation.	2.2.2
	Change font and font styles.	2.2.3
	Apply highlighting.	2.2.7
	Apply Number formats.	2.2.6
	Wrap text within cells.	2.2.5
	Merge cells.	2.2.1
To copy cell formatting with the Format Painter.	Use Format Painter.	2.2.4
To use Paste Special options.		
To format cells with styles.	Apply cell styles.	2.2.8
To work with hyperlinked data.	Insert hyperlinks.	1.2.2
To apply conditional formatting to cells.	Apply conditional formatting.	2.3.1
To clear a cell's formatting.		

Knowledge Assessment

Multiple Choice

Select the best response for the following statements.

1. You want to insert a cell into your worksheet. Which command do you use?
   a. The Insert command in the Cells group on the HOME tab
   b. The Format command in the Cells group on the HOME tab
   c. The Format Painter command in the Clipboard group on the HOME tab
   d. The Format command in the shortcut menu when you right-click a cell
2. You want to format a cell so the text is spread evenly throughout the cell, wrapping automatically and adjusting the row height, if necessary. Which alignment option do you choose?
   a. Center
   b. Middle Align
   c. Justify
   d. Distributed
3. You want to fit a long column heading into a small space without changing the font size or column width. Which of the following is the best choice?
   a. Adjust text orientation.
   b. Use the Center alignment command.
   c. Use the Merge & Center command.
   d. Apply a special character attribute.
4. How do you display the Mini toolbar?
   a. Left-click a cell.
   b. Right-click a cell.
   c. Select Format > Mini toolbar.
   d. Select View > Mini toolbar.

5. Which of the following can you *not* copy using Format Painter?
   a. Font color
   b. Bold
   c. Font size
   d. Cell content
6. Which Paste Special option pastes only the result of a formula rather than the formula itself?
   a. Formulas
   b. Values
   c. Formats
   d. Formulas and number formats
7. You don't like the cell style you just applied. Which of the following is the least effective way to remove or replace the style?
   a. Apply another style to the cell.
   b. Use the Undo command.
   c. Clear the cell's content.
   d. Apply the Normal style to the cell.
8. How do you remove a hyperlink?
   a. Delete the cell.
   b. Edit the cell's style.
   c. Reformat the cell.
   d. Right-click the cell and select Remove Hyperlink.
9. In which group on the HOME tab is the Clear Formats command located?
   a. In the Editing group
   b. In the Clipboard group
   c. In the Font group
   d. In the Cells group
10. Which of the following is *not* useful for changing the font size?
    a. Font Size drop-down list
    b. Increase Font Size button
    c. Decrease Font Size button
    d. Orientation button

True / False

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

T F 1. When you delete cells in a worksheet, you remove one or more cells, forcing other cells to move down or to the right.

T F 2. When selecting a font color, you can choose a themed color but not a standard color from the palette.

T F 3. When you point to defined styles in the Cell Styles gallery, you can see the formatting that will be used when you apply each style.

T F 4. Underlining a cell's content is the same as adding a border.

T F 5. You can apply multiple conditional formatting criteria or rules to the same set of data.

T F 6. Deleting a cell is the same as clearing a cell's content.

T F 7. A hyperlink enables you to navigate to a web page, another file, or to a specific location in another file.

T F 8. Style attributes include fonts and font sizes, number formats, and borders and shading.

T F 9. You cannot split a single worksheet cell that has not been merged.

T F 10. After you select a color and apply it to a cell's background, the Fill Color button takes on that color.

Competency Assessment

Project 6-1: Apply Basic Formatting

Apply basic formatting to a worksheet listing regional sales figures for a sports equipment reseller.

GET READY. Launch Excel if it is not already running.

1. OPEN ***06 Regional Sales***.
2. Select **A1:E1**.
3. Merge and center the worksheet title.
4. Select **A2:E2**.
5. Bold and center the headings.
6. Select **B3:E6**.
7. Apply the Currency number format.
8. Decrease the decimal places by two, so no decimal places appear.
9. SAVE the workbook to your Lesson 6 folder as ***06 Regional Sales Solution***.

LEAVE the workbook open for the next project.

Project 6-2: Apply Cell Styles to a Worksheet

Total sales figures and apply styles to enhance the appearance of a worksheet listing regional sales figures for a sports equipment reseller.

GET READY. Launch Excel if it is not already running.

1. OPEN ***06 Regional Sales Solution*** if it's not already open.
2. In cell **A7**, type the word **Total**.
3. Select **B7:E7**.
4. AutoSum each cell.
5. Click **A1**.
6. In the Cell Styles menu, apply the **Title** style.
7. Select **A2:E2**.
8. In the Cell Styles menu, apply the **Accent6** style.
9. Select **A3:A7**.
10. Apply the **40% - Accent6** cell style.
11. Select **B3:E7**.
12. Apply the **20% - Accent6** cell style.
13. Select **A7:E7**.
14. Bold all cells in the range.
15. SAVE the workbook to your Lesson 6 folder as ***06 Regional Sales Formatted Solution*** and CLOSE the file.

LEAVE Excel open for the next project.

Proficiency Assessment

Project 6-3: Format a Student List for Readability

Use a variety of techniques to improve the readability of a School of Fine Arts student list. Techniques include Merge & Center, applying italics, wrapping text, and using the Decrease Decimal command.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***06 Fine Art***.
2. Merge and center **A1:E1**.
3. Apply **Calibri Light**, **16-point**, **Blue** to the cell A1 content.
4. Center and italicize the content in cells **A2:E2**.
5. Widen column **C** so all text displays in its entirety.
6. Wrap the text in cell D2.
7. Decrease the width of column D to fit the longest date.
8. Format row 2 to autofit the row height.
9. Format the content in **E3:E12** so that only two decimal places display.
10. Decrease the width of column E to eliminate unnecessary whitespace.
11. SAVE the workbook to your Lesson 6 folder as ***06 Fine Art Solution***.

LEAVE the file open for the next project.

Project 6-4: Use Pasting Techniques to Add Entries to a Worksheet

Add rows of data to a worksheet, and use Format Painter and Paste Special to apply formatting and copy formulas.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***06 Fine Art Solution*** if it's not already open.
2. Add two more rows of data, as follows:

First	Last	Discipline	Enrollment Date	GPA
Cassie	Hicks	Painting	1/14/2013	
Jeff	Price	Computer Art	1/14/2013	

3. Use the Format Painter to format cells **A13:D14** in the same style as A12:D12.
4. Use the Copy command to copy the new enrollment date (1/14/2013) to replace the 1/3/2013 dates in rows 11 and 12.
5. Use Paste Special to copy the GPA formula and number format from a cell that displays a GPA to the two new cells that do not have GPAs entered.
6. Modify the formula in the GPA column for Cassie Hicks to total **3.3**, **3.5**, and **3.7**.
7. Modify the formula in the GPA column for Jeff Price to total **2.9**, **3.4**, and **3.5**.
8. Format **A2:E2** as **20% - Accent1** and reapply italics.
9. SAVE the workbook to your Lesson 6 folder as ***06 Fine Art Revised Solution*** and CLOSE the file.

LEAVE Excel open for the next project.

Mastery Assessment

Project 6-5: Create a Custom Style

Create a new style and configure its settings, apply the style, and then modify the style settings.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN a new, blank workbook.
2. Create a new cell style using your first name as the style name. Include the following formats in the style:
   Alignment: **Horizontal Center**, **Vertical Center**
   Font: **Arial Narrow, 16-point, Italic**
   Border Style: **Solid line (your choice), Bottom**
   Border Color: **Dark Blue**
   Fill Color: **Light Blue**
   Pattern Style: **6.25% Gray**
3. Type your first name in cell A1 and apply the style to your name.
4. Modify the style to remove the pattern style. Widen column A, if necessary.
5. SAVE the workbook to your Lesson 6 folder as ***06 My Style Solution*** and then CLOSE the file.

LEAVE Excel open for the next project.

Project 6-6: Analyze Trends in Sales

Apply conditional formatting to regional sales figures to determine dollar amounts above and below specific levels.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***06 Regional Sales Formatted Solution*** from a previous project.
2. Use conditional formatting to indicate which sales figures exceeded $24,000.
3. Use conditional formatting to indicate, in a different color, which sales figures were below $20,000.
4. SAVE the workbook to your Lesson 6 folder as ***06 Regional Sales Trends Solution*** and then CLOSE the file.

CLOSE Excel.

Formatting Worksheets 7

LESSON SKILL MATRIX

Skills	Exam Objective	Objective Number
Working with Rows and Columns	Insert and delete columns and rows.	1.3.3
	Adjust row height and column width.	1.3.5
	Hide columns and rows.	1.4.2
	Transpose columns and rows.	2.3.3
Using Themes	Change workbook themes.	1.3.4
Modifying a Worksheet's Onscreen and Printed Appearance	Modify page setup.	1.3.2
Inserting Headers and Footers	Insert headers and footers.	1.3.7
	Insert watermarks.	1.3.6
	Repeat headers and footers.	1.5.5
Preparing a Document for Printing	Set print scaling.	1.5.4
	Configure workbooks to print.	1.5.7

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KEY TERMS

- boundary
- column heading
- column width
- document theme
- effects
- footer
- gridlines
- header
- orientation
- page break
- Page Break Preview
- Print Preview
- row heading
- row height
- scaling
- transposing
- watermark
- white space

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Consolidated Messenger is a same-day and rush delivery service to more than 500 attorneys in New York City. The company offers foot, bike, and vehicle deliveries to provide court filings, process serving, document and small package delivery, and records retrieval. Consolidated Messenger dispatchers use Excel worksheets to track daily deliveries. The accounting department combines worksheets from all dispatchers to process invoices and payroll, and to provide reports to management. The management reports must look professional and be highly readable whether viewed onscreen or printed. In this lesson, you learn how to work with rows and columns in a worksheet, apply themes, modify a worksheet's onscreen and printed appearance, insert headers and footers, and prepare a document for printing.

SOFTWARE ORIENTATION

Formatting Excel Worksheets

Excel 2013 provides many tools to enhance the look of your worksheets whether viewed onscreen or in print. To improve how a worksheet displays on a computer monitor or to prepare a worksheet for printing, you will use commands mainly on the HOME tab and the PAGE LAYOUT tab, shown in Figure 7-1. Using and applying formatting options from the command groups on these tabs ensures that your worksheets are more useful, more readable, and more attractive.

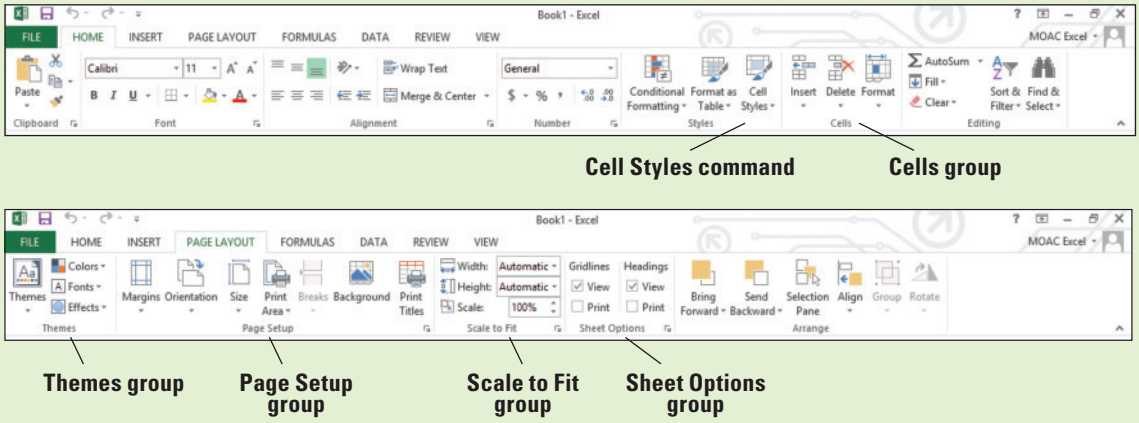


Figure 7-1

HOME tab and PAGE LAYOUT tab command groups

WORKING WITH ROWS AND COLUMNS

Bottom Line

Microsoft designed Excel worksheets for flexibility, enabling you to insert or delete rows and columns in an existing worksheet, increase or decrease row height and column width, and apply all kinds of formatting to entire rows and columns. You can also hide and unhide rows and columns, and even transpose data so that data in a row appears in a column and vice versa.

Inserting or Deleting a Row or Column

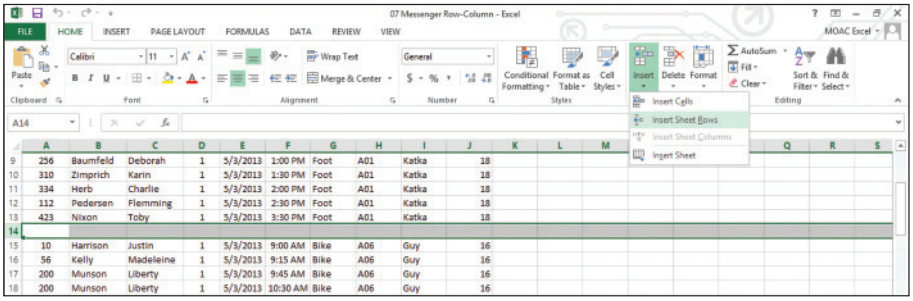
Many times, after you've already entered data in a worksheet, you will need to insert additional rows or columns. To insert a row, select the row or a cell in the row *below* which you want the new row to appear. The new row is then inserted *above* the selected cell or row. To insert multiple rows, select the same number of rows as you want to insert. Inserting columns works the same way, except columns are inserted to the *left* of the selected cell or column. By default, the inserted column is formatted the same as the column to the left. Deleting a row or column is just as easy—just select and delete.

STEP BY STEP Insert and Delete Rows and Columns

GET READY. Before you begin these steps, be sure to launch Microsoft Excel.

1. Open the workbook named ***07 Messenger Row-Column***.
2. Click the row **14** heading to select the entire row.
3. On the HOME tab, in the Cells group, click the **Insert** button arrow and select **Insert Sheet Rows**, as shown in Figure 7-2. A new blank row appears as row 14.

Figure 7-2
The Insert menu



CERTIFICATION READY? 1.3.3

How do you insert a row in a worksheet?

4. To insert several rows at once, click the row **25** heading, hold down the **Ctrl** key, and then click row headings **34** and **43**. Right-click any of the selected rows and select **Insert** from the shortcut menu. Blank rows appear above the selected rows, so that data for each messenger is separated by a blank row.
5. Click the **column D** heading to select the entire column. This column contains the delivery zone.
6. On the HOME tab, in the Cells group, click the **Delete** button arrow and select **Delete Sheet Columns**. The Zone column disappears.
7. Right-click the row **3** heading and select **Insert** from the shortcut menu. In cell A3, type **Zone 1**.
8. Select **A3:I3**. On the HOME tab, in the Alignment group, click the **Merge & Center** button. The "Zone 1" text is centered across the data columns.
9. SAVE the workbook as ***07 Messenger Row-Column Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Another Way

To delete an entire row, select the row or rows to be deleted, right-click the selection, and select Delete from the shortcut menu.

CERTIFICATION READY? 1.3.3

How do you delete a row from a worksheet?

The **row heading** or **column heading** is its identifying letter or number. You select an entire row or column by clicking its heading. To select multiple adjacent rows or columns, click the first

row or column heading, hold the Shift key, and then click the last heading. You can also select multiple nonadjacent rows or columns. Just click the first row or column heading, and then hold down the Ctrl key while clicking other headings.

Modifying Row Height and Column Width

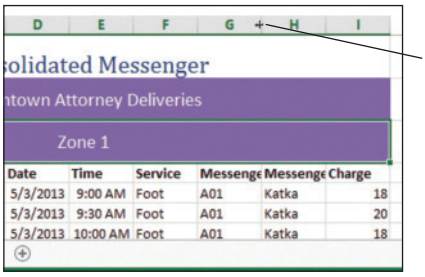
By default, all columns in a new worksheet are the same width and all rows are the same height. In most worksheets, you will want to change some column or row defaults to accommodate the worksheet's data. Modifying the height of rows and width of columns can make a worksheet's contents easier to read and increase its visual appeal. You can set a row or column to a specific height or width or change the height or width to fit the contents. To change height and width settings, use the Format commands in the Cells group on the HOME tab, use the shortcut menu that appears when you right-click a selected row or column, or double-click or drag the **boundary**, which is the line between rows or columns.

STEP BY STEP Modify Row Height and Column Width

GET READY. USE the workbook from the previous exercise.

1. Double-click the **boundary** to the right of the column G heading (see Figure 7-3), which adjusts the column width to show all content in column G.

Figure 7-3
Double-clicking the boundary line between columns G and H

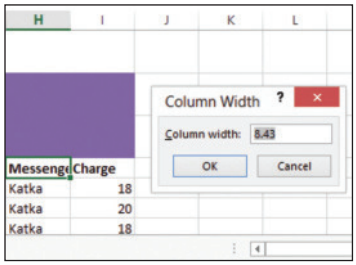


CERTIFICATION READY? 1.3.5

How do you adjust the width of a column in a worksheet?

2. Click anywhere in column **H**. On the HOME tab, in the Cells group, click the **Format** button arrow and select **Column Width**. In the Column Width dialog box (see Figure 7-4), in the Column width text box, type **16** and then click **OK**. All content in column H appears.

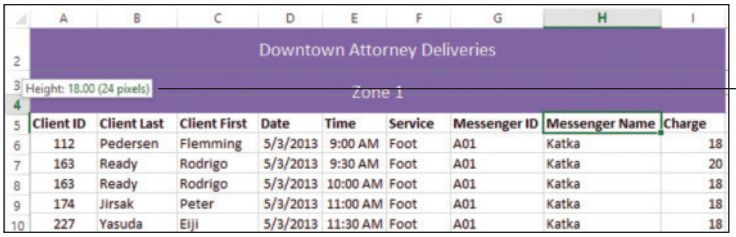
Figure 7-4
The Column Width dialog box



3. Click and hold the **boundary** under the row 3 heading. Drag the line up to decrease the height of row 3 to **18**, as shown in Figure 7-5. Notice that a ScreenTip appears as you drag the boundary line, showing you the height of the row in points (the first number) and pixels.

Figure 7-5

Decreasing a row's height by dragging the boundary line



Client ID	Client Last	Client First	Date	Time	Service	Messenger ID	Messenger Name	Charge
112	Pedersen	Flemming	5/3/2013	9:00 AM	Foot	A01	Katka	18
163	Ready	Rodrigo	5/3/2013	9:30 AM	Foot	A01	Katka	20
163	Ready	Rodrigo	5/3/2013	10:00 AM	Foot	A01	Katka	18
174	Jirsak	Peter	5/3/2013	11:00 AM	Foot	A01	Katka	18
227	Yasuda	Eiji	5/3/2013	11:30 AM	Foot	A01	Katka	18

Another Way

To access the Column Width dialog box to change a column's width, select the column, right-click the selection, and select Column Width from the shortcut menu.

4. Select row 2. On the HOME tab, in the Cells group, click the **Format** button arrow and select **AutoFit Row Height**. With the row still selected, click the **Format** button arrow again and select **Row Height**. The Row Height dialog box indicates that the row is 18.75 points in height. Click **OK**.
5. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

CERTIFICATION READY? 1.3.5

How do you adjust the height of a row in a worksheet?

Row height, or the top-to-bottom measurement of a row, is measured in points; one point is equal to 1/72 inch. The default row height is 15 points, but you can specify a row height of 0 to 409 points. **Column width** is the left-to-right measurement of a column. Although you can specify a column width of 0 to 255 characters, the default column width is 8.43 characters (based on the default font and font size). If a column width or row height is set to 0, the corresponding column or row is hidden.

As you learned in Lesson 2, when the text you enter exceeds the column width, the text overflows to the next column, or it is truncated when the next cell contains data. Similarly, if the value entered in a column exceeds the column width, the #### symbols appear, which indicate the number is larger than the column width.

Take Note To quickly AutoFit the entries in all rows on a worksheet, click the Select All icon in the upper-left corner of your worksheet (at the intersection of column and row headings), then double-click one of the row boundaries.

Depending on the alignment of the data in your columns, worksheet data may appear crowded or too loose when you use the AutoFit Column Width option because this option adjusts column width to the exact width of the longest entry in the column. Therefore, after using this option, you may want to use the mouse to drag the right column boundary for any columns that seem crowded or have too much white space. **White space** is the empty area of a document, in which no content appears.

Take Note You can use the Format Painter to copy the width of one column to other columns. To do so, select the heading of the first column, click the Format Painter, and then click the heading of the column or columns to which you want to apply the column width.

In Excel, you can change the default width for all columns on a worksheet or a workbook. To do so, click Format and then select Default Width. In the Standard Width dialog box, type a new default column measurement. Note that when changing the default column width or row height, columns and rows that contain data or that have been previously formatted retain their formatting.

Formatting an Entire Row or Column

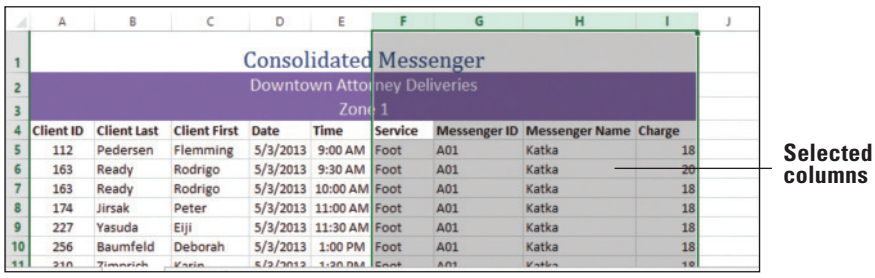
To save time, achieve a consistent appearance, and align cell contents in a consistent manner, you often want to apply the same format to an entire row or column. To apply formatting to a row or column, click the row heading or column heading to select it, and then apply the appropriate format or style.

STEP BY STEP Format an Entire Row or Column

GET READY. USE the workbook from the previous exercise.

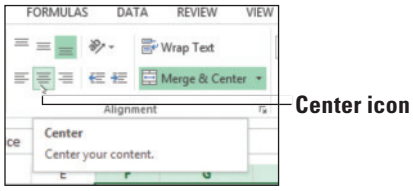
1. Select columns F through I by clicking the **column F heading**, pressing the **Shift** key, and clicking the **column I heading**. All four columns are selected, as shown in Figure 7-6.

Figure 7-6
Four columns selected



2. On the HOME tab, in the Alignment group, click the **Center** icon, as shown in Figure 7-7. The content in columns F through I is centered.

Figure 7-7
The Center icon in the Alignment group



3. Click the **column I heading**. The Charge column is selected.
4. On the HOME tab, in the Number group, select **Currency** from the Number Format menu. Only the values in column I are styled as currency.
5. Select **row 4** and center the column headings using the **Center** icon.
6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

In this exercise, you could have selected data ranges and then applied formatting. For example, you could have selected A4: I4 and centered the headings. However, formatting rows and columns rather than applying formatting to a range of cells that contain data has an advantage: When you insert rows or columns or add additional data to a worksheet in the future, the new data will be formatted correctly.

Some formatting shouldn't be applied to an entire row or column. For example, when you apply a cell style with an underline effect, such as the Heading 1 cell style, to an entire row, you will see the underline in all blank cells to the end of the row (cell XFD1).

Hiding or Unhiding a Row or Column

You may not want or need all rows and columns in a worksheet to be visible all the time, particularly if the worksheet contains a large number of rows or columns. You can hide a row or a column by using the Hide command or by setting the row height or column width to zero. When rows are hidden, they do not appear onscreen or in printouts, but the data remains and can be unhidden.

STEP BY STEP Hide or Unhide a Row or Column

CERTIFICATION READY? 1.4.2

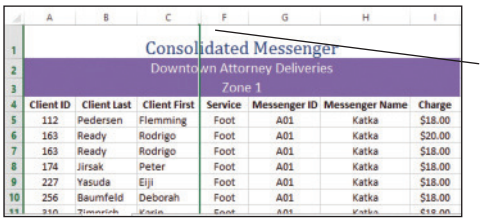
How do you hide a row or column in a worksheet?

GET READY. USE the workbook from the previous exercise.

1. Select **columns D** and **E**. The columns for Date and Time are selected.
2. Right-click the column D or E heading and select **Hide**. The Date and Time columns are hidden from view, and a green line appears, indicating hidden content, as shown in Figure 7-8.

Figure 7-8

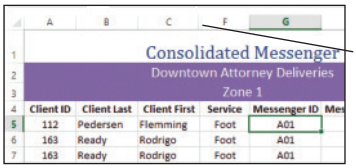
The Date and Time columns are no longer visible in the worksheet.



3. Click in any cell. The green line disappears, and the boundary between columns C and F is a double vertical line (see Figure 7-9), which indicates hidden columns.

Figure 7-9

The double vertical boundary line indicates hidden columns.



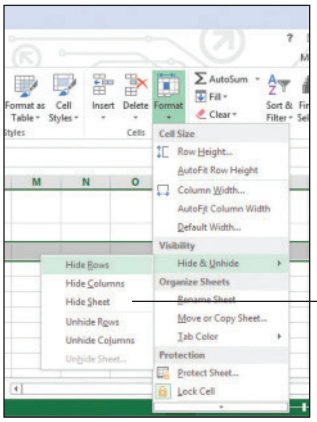
CERTIFICATION READY? 1.4.2

How do you unhide a row or column in a worksheet?

4. Select **row 3**. On the HOME tab, in the Cells group, click the **Format button arrow**, point to **Hide & Unhide**, and select **Hide Rows**, as shown in Figure 7-10. Row 3 is now hidden.

Figure 7-10

The Hide & Unhide menu



Another Way

To unhide a row or column, double-click the double lines in the row or column heading that indicate hidden content.

5. Select **rows 2** and **4**. Right-click the selection and select **Unhide**. Row 3 is now visible.

Troubleshooting

When you select rows 2 and 4 to unhide the hidden row, you must select them in a way that includes the hidden rows. Press Shift when you select row 4 or select row 2 and drag to include row 4. If you select row 2, press Ctrl, and click row 4, the hidden row will not unhide. Additionally, selecting only the data in the rows will not release the hidden row.

6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

A worksheet may contain rows or columns of sensitive or extraneous data that you are not using or do not want to be visible while you are working in other areas of the worksheet. Using the Hide command simply hides them from view, but they still exist in the worksheet.

To make hidden rows visible, select the row above and the row below the hidden row or rows and use the Unhide Rows command. To display hidden columns, select the adjacent columns and follow the same steps used for displaying hidden rows.

You can use the Go To feature, introduced in Lesson 1, to find a hidden row or column and then make it visible.

Transposing Rows or Columns

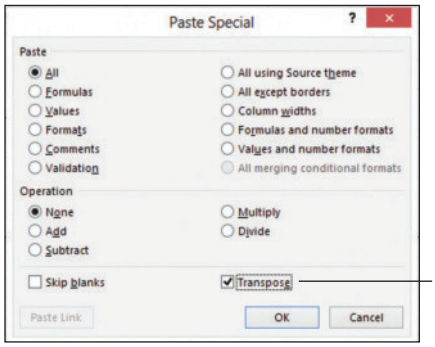
Transposing a row or column causes your cell data to change orientation. Row data will become column data, and column data will become row data. You can use the Paste Special command to perform this type of irregular cell copying. In the Paste Special dialog box, select the Transpose check box to transpose row or column data.

STEP BY STEP — Transpose Rows or Columns

GET READY. USE the workbook from the previous exercise.

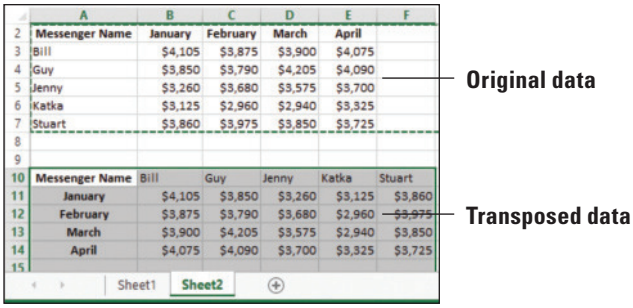
1. Click the **Sheet2** tab.
2. Select **rows 2** through **7**, and then press **Ctrl + C** to copy the data to the Clipboard. A green marquee border appears.
3. Click cell **A10**.
4. On the HOME tab, in the Clipboard group, click the **Paste** button arrow and select **Paste Special**. The Paste Special dialog box opens.
5. Check the **Transpose** check box, as shown in Figure 7-11.

Figure 7-11
The Paste Special dialog box



6. Click **OK**. The data appears with the row data in columns and the column data in rows, as shown in Figure 7-12.

Figure 7-12
Transposed data



Messenger Name	January	February	March	April
Bill	$4,105	$3,875	$3,900	$4,075
Guy	$3,850	$3,790	$4,205	$4,090
Jenny	$3,260	$3,680	$3,575	$3,700
Katka	$3,125	$2,960	$2,940	$3,325
Stuart	$3,860	$3,975	$3,850	$3,725

Messenger Name	Bill	Guy	Jenny	Katka	Stuart
January	$4,105	$3,850	$3,260	$3,125	$3,860
February	$3,875	$3,790	$3,680	$2,960	$3,975
March	$3,900	$4,205	$3,575	$2,940	$3,850
April	$4,075	$4,090	$3,700	$3,325	$3,725

CERTIFICATION READY? 2.3.3

How do you transpose a row or column?

7. Click the **Sheet1** tab to return to the main worksheet.
8. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

USING THEMES

Bottom Line

A **document theme** is a predefined set of colors, fonts, and effects that can be applied to an entire workbook or to specific items within a workbook, such as charts or tables. You can use document themes to easily format an entire document and give it a fresh, professional look. Themes can be shared across other Office applications, such as Microsoft Office Word and Microsoft Office PowerPoint, enabling you to give all your Office documents a uniform look in terms of colors, fonts, and effects. (**Effects**, such as shadows or bevels, modify the appearance of an object.)

Choosing a Theme for a Workbook

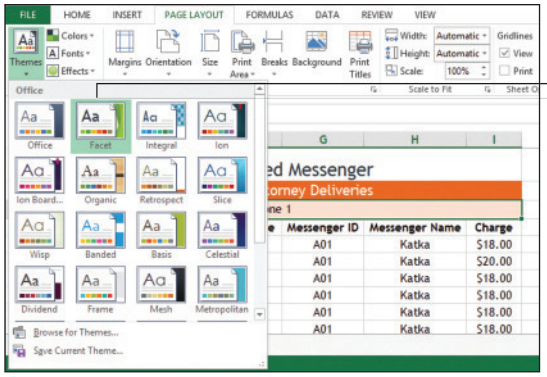
Excel has several predefined document themes. When you apply a theme to a workbook, the colors, fonts, and effects contained within that theme replace any styles that were already applied to cells or ranges.

STEP BY STEP **Choose a Theme for a Workbook**

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***07 Messenger Theme*** data file for this lesson.
2. With Sheet1 active, click cell **A3**.
3. On the HOME tab, in the Styles group, click the **Cell Styles** button arrow and select **20% - Accent 4**. A light purple background is applied to the cell range, the font size is reduced, and the font color changes to black.
4. On the PAGE LAYOUT tab, in the Themes group, click the **Themes** button arrow to open the Themes gallery. Several built-in themes appear in the gallery. Move your mouse pointer over each theme to see its effect on the underlying worksheet, which is referred to as Live Preview.
5. Find and select the **Facet** theme, as shown in Figure 7-13. You just changed the default document theme to the Facet theme. The font for subheadings and general data changed from Calibri to Trebuchet MS, and the background of cells A3:I3 is now a light pink color.

Figure 7-13
The Themes gallery



CERTIFICATION READY? 1.3.4

How do you change a workbook theme?

6. Click **Sheet2**. Notice that the font changed on that sheet as well.
7. Click **Sheet1** to return to the main worksheet. On the HOME tab, in the Styles group, click the **Cell Styles** button arrow to display the Styles gallery. Notice that the color schemes for the various groups have changed. This is because a new document theme has been applied, and several built-in cell styles were created using theme fonts and colors.
8. SAVE the workbook as ***07 Messenger Theme Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

The default document theme in Excel 2013 is named Office. Document themes are consistent in all Microsoft Office 2013 programs.

Applying a new theme changes fonts and colors, and the color of shapes and SmartArt, tables, charts, and other objects.

Cross Ref

You'll learn about tables in Lesson 9, charts in Lesson 12, and shapes, SmartArt, and other graphics in Lesson 13.

Remember that cell styles are used to format specific cells or ranges within a worksheet; document themes are used to apply sets of styles (colors, fonts, lines, and fill effects) to an entire document.

Many built-in cell styles use theme-aware formatting, so applying a new theme determines which fonts and colors are used by styles. That's why you noticed a change in the Styles gallery after applying the new theme in the exercise. However, styles are independent from themes in that you can change styles regardless of the theme that's applied to a document.

Take Note

When you apply a heading cell style to text and then increase the font size of that cell, the font size will not change after applying a new document theme. If you don't change the font size of heading text, apply a heading cell style, and then apply a new theme, the heading text will display in the default font size for the new theme.

Customizing a Theme

You can create a customized theme by making changes to one or more of an existing theme's components—colors, fonts, or effects (line and fill effects). The changes you make to one or more of a theme's components immediately affect the styles that you have applied in the active document. Many companies create a customized document theme and use it consistently. You can experiment by applying various predefined themes until you decide on the "look" that appeals to you.

Customizing a Theme by Selecting Colors

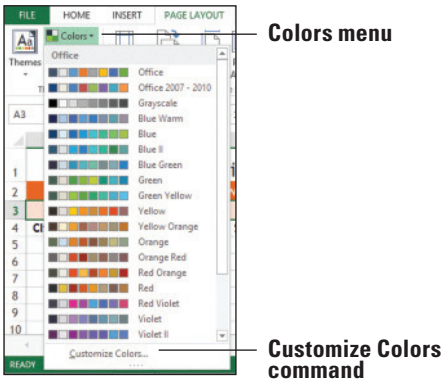
Although Excel provides several themes you can apply to your workbook, you can modify the color scheme for any theme. You can then save the new color scheme and use it in a custom theme.

STEP BY STEP Customize a Theme by Selecting Colors

GET READY. USE the workbook from the previous exercise.

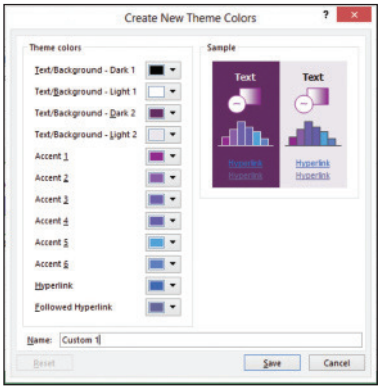
1. Ensure Sheet1 is active.
2. On the PAGE LAYOUT tab, in the Themes group, click **Colors**. Figure 7-14 illustrates the color array for some of the built-in themes. You have to scroll through the entire list to see them all. Each theme has an array of accent colors that are the same as the accents in the Styles group.

Figure 7-14
Theme colors



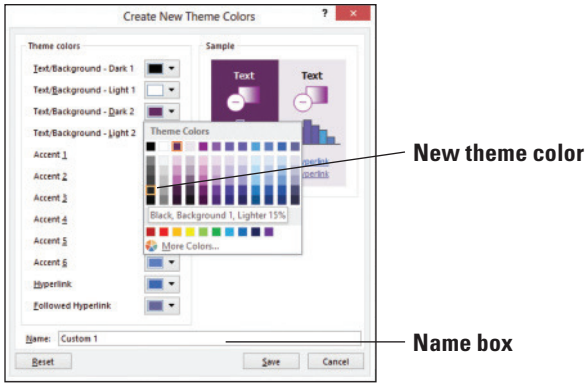
3. Scroll down and select **Violet II**.
4. Open the **Colors** menu again and click **Customize Colors** at the bottom of the menu. The Create New Theme Colors dialog box opens (see Figure 7-15), showing the colors used with the Violet II color scheme currently applied to the Facet theme. Move the dialog box so you can see the worksheet more clearly, if necessary.

Figure 7-15
Create New Theme Colors dialog box



5. Open the **Text/Background - Dark 2 drop-down list**. The current color is highlighted under Theme Colors. Click **Black, Background 1, Lighter 15%** as shown in Figure 7-16 to change the color to dark gray.

Figure 7-16
Selecting a new theme color



6. In the Name box at the bottom of the dialog box, type **Consolidated Messenger** and click **Save**. The new text color is reflected in row 1. If you want to modify colors for Consolidated Messenger in the future, just modify the Consolidated Messenger color scheme, which appears at the top of the Colors menu.
7. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Take Note To return all theme color elements to their original colors, click the Reset button in the Create New Theme Colors dialog box before you click Save.

In the Create New Theme Colors dialog box, click the button next to the theme color element you want to change. Theme colors are presented in every color gallery with a set of lines and shades based on those colors. By selecting colors from this matched set, you can make formatting choices for individual pieces of content that will still follow the themes. When the theme colors change, the gallery of colors changes and so does all document content using them.

Theme colors (referred to as color schemes) contain four text and background colors, six accent colors, and two hyperlink colors. It is easy to create your own theme that can be applied to all of your Excel workbooks and other Office 2013 documents. You can choose any of the color schemes shown in Figure 7-14, or you can create your own combination of colors.

Customizing a Theme by Selecting Fonts and Effects

Now that you have customized the color of your themes, you are ready to choose the font for your theme. Use fonts and effects that create a unique look for your documents. Themes contain a heading font and a body font. When you click the Theme Fonts button, you see the name of the heading font and the body font that is used for each theme.

STEP BY STEP Customize a Theme by Selecting Fonts and Effects

GET READY. USE the workbook from the previous exercise.

1. With Sheet1 active, on the PAGE LAYOUT tab, in the Themes group, click **Fonts**.
2. Click **Customize Fonts**. The Create New Theme Fonts dialog box opens.
3. Open the Heading font drop-down menu, locate the **Arial** font, and select it.
4. In the Body font box, locate and select **Arial Narrow**. The preview in the Sample box is updated with the fonts that you selected.
5. In the Name box, type **Consolidated Messenger** as the name for the new theme fonts and click **Save**. Your customized theme fonts will be available for you to use to customize any of the built-in themes or to use the next time you click Cell Styles on the HOME tab. (See Figure 7-17.)

Figure 7-17

Cell styles that use built-in themes reflect any changes you make to theme fonts.

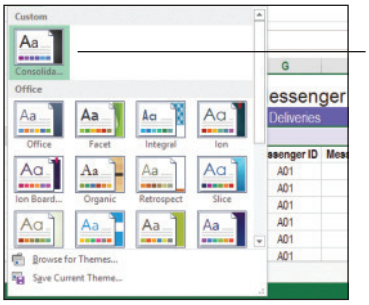
Troubleshooting

If your customized theme font is not automatically applied, click Cell Styles and click the customized heading font to apply it. For example, click A1, go to Cell Styles on the HOME tab, and select Title.

6. On the PAGE LAYOUT tab, in the Themes group, click **Themes** and then click **Save Current Theme**. The Save Current Theme dialog box opens.
7. In the File name box, type **Consolidated Messenger** and click **Save**. Your customized document theme is saved in the Document Themes folder, and it is automatically added to the list of custom themes that now appears at the top of the Themes gallery, as shown in Figure 7-18.

Figure 7-18

Custom theme appears at the top of the Themes gallery.



8. On the PAGE LAYOUT tab, in the Themes group, click **Effects**. Theme effects are sets of lines and fill effects. Hovering your mouse over the effects might show subtle changes in the cells; however, you will notice the result of changing an effect only if you have charts, shapes, SmartArt, or similar graphics in your workbook.
9. Click the **Reflection** effect to apply it to the workbook. In the Quick Access Toolbar, click **Undo** to undo the theme effect.
10. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

You can customize any of the built-in themes by changing the attributes of the theme. For example, say you like the colors in the Organic theme but you want to use a different font. In this situation, first apply the Organic theme, then click Theme Fonts and apply the font of your choice.

You can then save the resulting theme and apply it to other documents. You cannot change the built-in theme effects, but you can apply a different built-in effect to modify the appearance of the theme you are editing, which can include changing the shading, beveling, or other effects.

If you want to delete a customized theme, open the Themes gallery, right-click the custom theme at the top of the gallery, and select Delete from the shortcut menu. The same principle applies to customized color schemes, font schemes, and effects schemes.

Workplace Ready

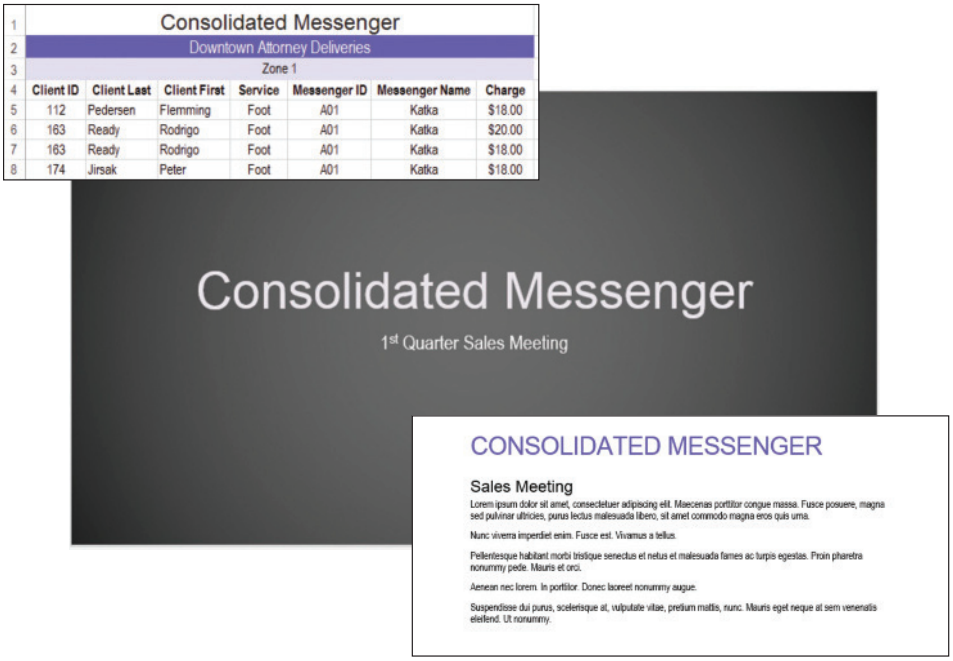
PUTTING THEMES TO WORK

Microsoft Office themes bring a unified look and feel to business documents across Office applications. Whether you use a ready-made theme or customize your own, you can apply the same theme to Excel, Word, and PowerPoint documents. You can also apply a theme to many of the templates available for all three applications. Let's look at some ideas for using themes effectively.

If your organization is divided into regions, create custom themes with the same fonts but different color schemes for each group. Apply the themes to each group's financial reports to know at a glance which report is for which group.

Prepare professional-looking meeting materials in Excel, Word, and PowerPoint with the same design elements by simply applying the same theme.

Create proposals, estimates, invoices, and project plans using the same theme, and include your organization's logo. Your prospects and customers will easily recognize your materials.



MODIFYING A WORKSHEET'S ONSCREEN AND PRINTED APPEARANCE

Bottom Line

You can draw attention to a worksheet's onscreen appearance by displaying a background picture. **Gridlines** (the lines that display around worksheet cells), row headings, and column headings also enhance a worksheet's appearance. Onscreen, these elements are displayed by default, but they are not printed automatically.

Formatting a Worksheet Background

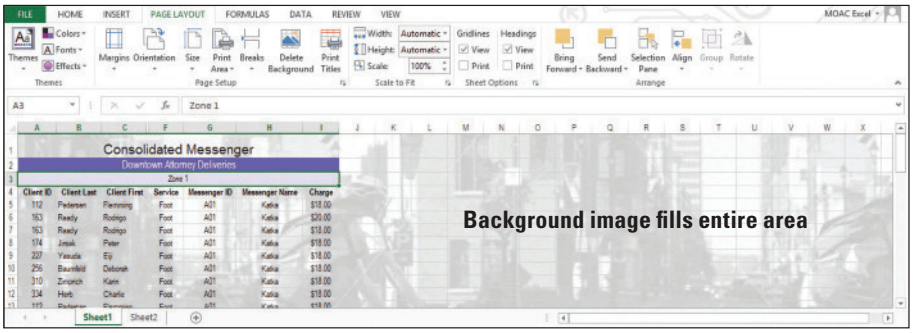
You can use a picture as a worksheet background for display purposes only. A worksheet background is saved with your worksheet, but it is not printed by default and it is not retained in a worksheet or as an item that you save as a web page.

STEP BY STEP Format a Worksheet Background

GET READY. LAUNCH Excel if it is not already running.

1. **OPEN** the ***07 Messenger Appearance*** data file for this lesson.
2. Ensure Sheet1 is active.
3. On the PAGE LAYOUT tab, in the Page Setup group, click the **Background** button. The Insert Pictures dialog box opens.
4. Click **Browse** next to From a file. The Sheet Background dialog box opens.
5. Navigate to the student data files folder, select ***07 bike_courier.jpg***, and then click **Insert**. The selected picture is displayed behind the text and fills the worksheet, as shown in Figure 7-19.

Figure 7-19
The worksheet with a background image



© Mike Clarke / iStockphoto

6. On the PAGE LAYOUT tab, in the Page Setup group, click **Delete Background**. The background is removed.
7. SAVE the workbook as ***07 Messenger Appearance Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

You should carefully consider the use of background images and use them judiciously. An image can detract from the readability of a worksheet if the wrong image is selected. You can lighten an image, or apply a light color cell shading, to make a background image work well. It's also best to remove gridlines when a sheet background is used. You'll learn about gridlines in the next section.

Viewing and Printing a Worksheet's Gridlines

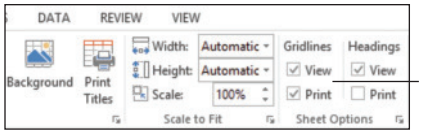
You can choose to show or hide gridlines in your worksheet. By default, gridlines are present when you open a worksheet. You can also choose whether gridlines are printed. A printed worksheet is easier to read when gridlines are included.

STEP BY STEP View and Print a Worksheet's Gridlines

GET READY. USE the workbook from the previous exercise.

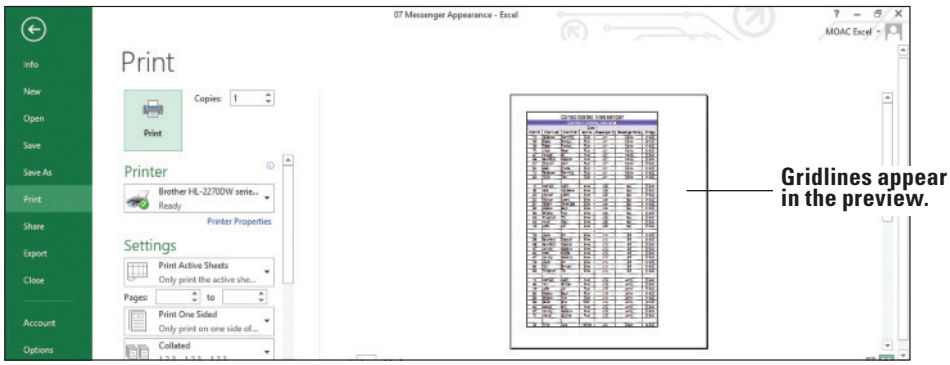
1. Ensure Sheet1 is active.
2. On the PAGE LAYOUT tab, in the Sheet Options group, uncheck the **Gridlines View** check box. The gridlines disappear from the worksheet.
3. Check the **Gridlines View** check box to restore viewable gridlines.
4. Check the **Gridlines Print** check box, as shown in Figure 7-20. This action will force gridlines to appear in your printed worksheet.

Figure 7-20
The Gridlines check boxes



5. Click the **Dialog Box Launcher** in the Sheet Options group to open the Page Setup dialog box.
6. On the Sheet tab, notice that the Gridlines check box is checked. Click the **Print Preview** button. Gridlines appear in the preview, as shown in Figure 7-21.

Figure 7-21
Print Preview showing gridlines



7. In the upper-left corner of the Print window, click the **Back** button to return to the worksheet.
8. SAVE the workbook.

CERTIFICATION READY? 1.3.2

How do you modify page setup?

PAUSE. LEAVE the workbook open to use in the next exercise.

Lesson 3 introduced you to Backstage, Print Preview, and some printing options. **Print Preview** is the screen that appears when you click the FILE tab and then click Print, or if you click Print Preview in a dialog box that provides the button. In Print Preview, you can see what your document will look like before sending it to the printer.

Viewing and Printing Column and Row Headings

You can choose whether to view row and column headings in your worksheet and to have them appear in printed worksheets. This exercise shows you how.

STEP BY STEP View and Print Column and Row Headings

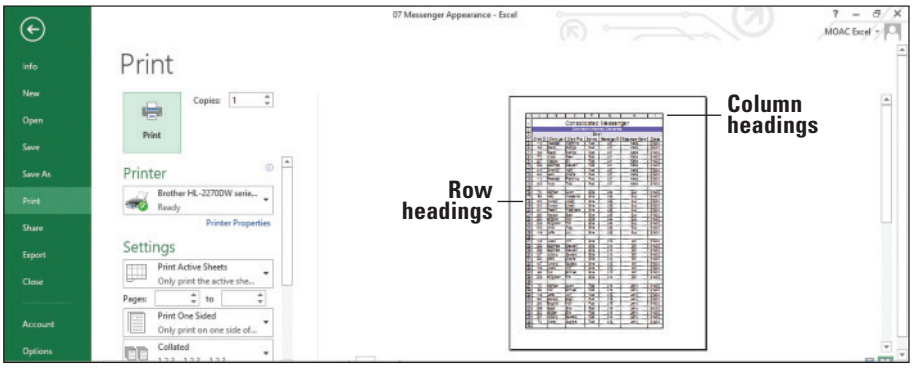
GET READY. USE the workbook from the previous exercise.

1. Ensure Sheet1 is active.
2. On the PAGE LAYOUT tab, in the Sheet Options group, uncheck the **Headings View** check box. The row and column headings disappear from the worksheet.
3. Check the **Headings View** check box to restore the row and column headings.
4. Check the **Headings Print** check box. This action forces row and column headings to appear in your printed worksheet.
5. In the Sheet Options group, click the **Dialog Box Launcher** to open the Page Setup dialog box.

6. On the Sheet tab, notice that the Row and column headings check box is checked. Click the **Print Preview** button. Row and column headings appear in the preview, as shown in Figure 7-22.

Figure 7-22

Print Preview showing row and column heading.



7. In the upper-left corner of the Print window, click the **Back** button to return to the worksheet.
8. On the PAGE LAYOUT tab, in the Sheet Options group, uncheck the **Headings Print** check box.
9. SAVE the workbook.

PAUSE. LEAVE Excel open to use in the next exercise.

INSERTING HEADERS AND FOOTERS

Bottom Line

You can add headers or footers to your worksheets to provide useful information about the worksheet, such as who prepared it, the date it was created or last modified, the page number, and so on. Headers and footers are visible in Page Layout view and appear on printouts. A **header** is a line of text that appears at the top of each page of a printed worksheet. **Footers** are lines of text that appear at the bottom of each page. You can add predefined header or footer information to a worksheet; insert elements such as page numbers, date and time, and filename; or add your own content to a header or footer.

Adding Page Numbers to a Worksheet

Page numbers are handy, and often necessary, for large worksheets that will print with multiple pages. The most common way to incorporate page numbers in a worksheet is to insert the page number code in the header or footer.

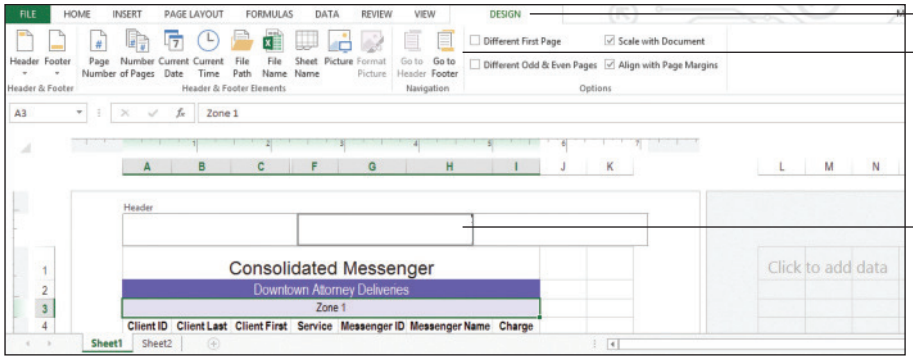
STEP BY STEP **Add Page Numbers to a Worksheet**

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***07 Messenger Header-Footer*** data file for this lesson.
2. Ensure Sheet1 is active.
3. On the INSERT tab, in the Text group, click the **Header & Footer** button. The worksheet is now displayed in Page Layout view. Note that the center Header text box is active and the DESIGN tab is added to the ribbon, as shown in Figure 7-23. The Header & Footer DESIGN tab command groups are thus available for you to use in the worksheet. By default, your cursor will appear in the center Header section.

Figure 7-23

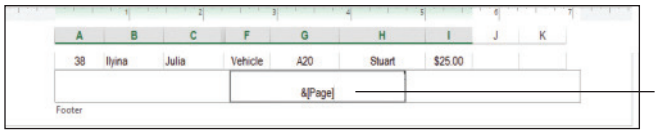
Page Layout view displaying the DESIGN tab



4. Click the **Go to Footer** button in the Navigation group on the ribbon. The cursor appears in the center text box in the footer.
5. In the Header & Footer Elements group, click **Page Number**. The code *&[Page]* appears in the text box, as shown in Figure 7-24. The ampersand symbol (&) indicates that the appropriate page number will be added to each page of the printed worksheet.

Figure 7-24

The page number code



6. Click in a worksheet cell that's not part of the footer, and then click the **Normal** view icon on the right side of the status bar.
7. SAVE the workbook as ***07 Messenger Header-Footer Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Take Note The addition of the DESIGN contextual tab illustrates one advantage of Excel's ribbon interface. With the ribbon, instead of every command being available all the time, some commands appear only in response to specific user actions.

Inserting a Predefined Header or Footer

On the DESIGN tab, the Header & Footer group contains predefined headers and footers that allow you to automatically add text to the header or footer, such as the date, page number, number of pages, name of the sheet, and so on.

STEP BY STEP **Insert a Predefined Header or Footer**

GET READY. USE the workbook from the previous exercise.

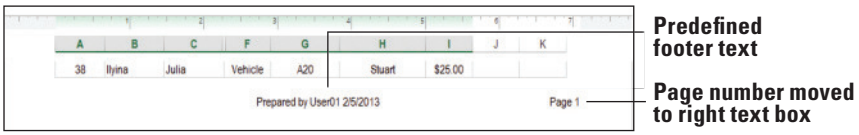
CERTIFICATION READY? 1.3.7

How do you insert predefined headers and footers?

1. Ensure Sheet1 is active. Click cell **A1**.
2. On the VIEW tab, in the Workbook Views group, click the **Page Layout** view button to view headers and footers.
3. Click the **center header text box** (which displays the "Click to add header" placeholder text). Click the **Header & Footer Tools DESIGN** tab now that it has become active. In the Header & Footer Elements group, click **Sheet Name**. *&[Tab]* appears in the text box.
4. In the Navigation group, click **Go to Footer**. Click the **right footer text box**.
5. In the Header & Footer group , click the **Footer** button arrow, and click the last option in the list, which combines Prepared by *username*, Current Date, and Page Number.

Because the footer is wider than the right text box, the majority of the footer is moved to the center text box, and the page number appears in the right text box, as shown in Figure 7-25.

Figure 7-25
The predefined footer



6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

You can populate headers and footers by selecting one or more predefined elements in Excel, which inserts codes into the header or footer. When your workbook is printed, Excel replaces these codes with the current date, current time, and so on. You can view how the headers and footers will look by using Print Preview in Backstage view.

Many of Excel's predefined headers and footers combine one or more elements. In the previous exercise, you inserted a combined entry by clicking it. You can then customize the appearance of your header or footer in Page Layout view. Within this view, once you have the header or footer selected, you can modify the appearance of the text it contains using the Font group on the HOME tab. In this way, you can change font type or size, add special effects, or add other options to your text.

Adding Content to a Header or Footer

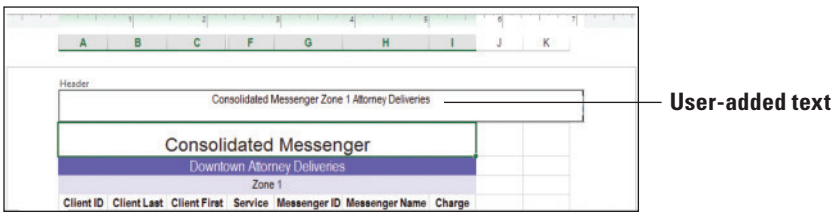
Excel's predefined headers and footers will not always meet your needs. When this happens, you can simply enter text into any of the header or footer text boxes.

STEP BY STEP **Add Content to a Header or Footer**

GET READY. USE the workbook from the previous exercise.

1. With Sheet1 active and in Page Layout view, click the **center header text box** and delete the existing header. You can click the **DESIGN** tab and then click **Go to Header** to move to the header quickly.
2. Type **Consolidated Messenger Zone 1 Attorney Deliveries**, as shown in Figure 7-26. When you preview your worksheet for printing or print the worksheet, you will see the header text.

Figure 7-26
Modifying a header with your own content



3. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

Inserting a Watermark

In most documents, a **watermark** is text or a picture that appears behind a document, similar to a sheet background in Excel. However, Excel doesn't print sheet backgrounds, so it cannot be used as a watermark. Excel 2013 doesn't provide a watermark feature, but you can mimic one by displaying a graphic in a header or footer. This graphic will appear behind the text, and it will display and print in the style of a watermark.

STEP BY STEP Insert a Watermark

GET READY. USE the workbook from the previous exercise.

1. Ensure Sheet1 is active and in Page Layout view.
2. Click the **left header text box**.
3. On the DESIGN tab in the Header & Footer Elements group, click **Picture**. Click the **Browse** button, navigate to the student data files folder, select ***07 watermark.gif***, and then click **Insert**. Excel inserts an *&[Picture]* code into the left header text box.
4. Click outside of the header area, and then click the **Normal** view icon on the status bar.
5. Click the **FILE** tab and then click **Print**. The preview shows the watermark in your worksheet, as shown in Figure 7-27. Click the **Back** button to exit Print Preview.

CERTIFICATION READY? 1.3.6

How do you insert a watermark?

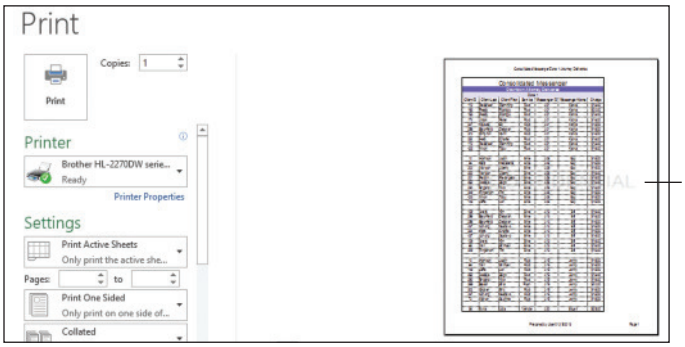


Figure 7-27
The worksheet with a watermark

6. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

The watermark in this exercise was created using a simple graphic program and saved as a transparent GIF file, so only the text and not the background of the image displays as a watermark.

You can resize or scale the picture using the Format Picture button on the DESIGN tab in the Header & Footer Elements group. Clicking the button opens the Format Picture dialog box, where you can select the options you want on the Size tab.

To remove the watermark, go to the header text box and delete the &[Picture] code.

Repeating Headers and Footers

In worksheets that span two or more pages, you can instruct Excel to print specific rows or columns on each page to give your readers a better perspective of the data they are viewing. They won't have to go back to the first page to see column or row headings or labels, which are also referred to as titles. Titles help to give your worksheet a uniform look from the first to the last page.

STEP BY STEP Repeat Headers and Footers

GET READY. USE the workbook from the previous exercise.

1. Ensure Sheet1 is active and in Normal view.
2. On the PAGE LAYOUT tab, in the Page Setup group, click the **Print Titles** button. The Page Setup dialog box opens to the Sheet tab.
3. Type **A1:I54** in the Print area text box. This is the range of all data on Sheet1 to be printed.

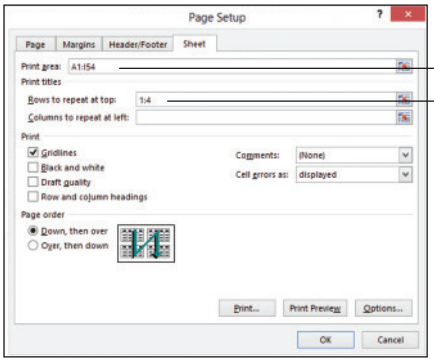
Cross Ref

You learned how to set the print area and some other print features in Lesson 3.

4. In the Rows to repeat at top text box, type **1:4**, as shown in Figure 7-28. This will repeat the first four rows of the worksheet, which includes column headings, on every page.

Figure 7-28

The Page Setup dialog box, Sheet tab



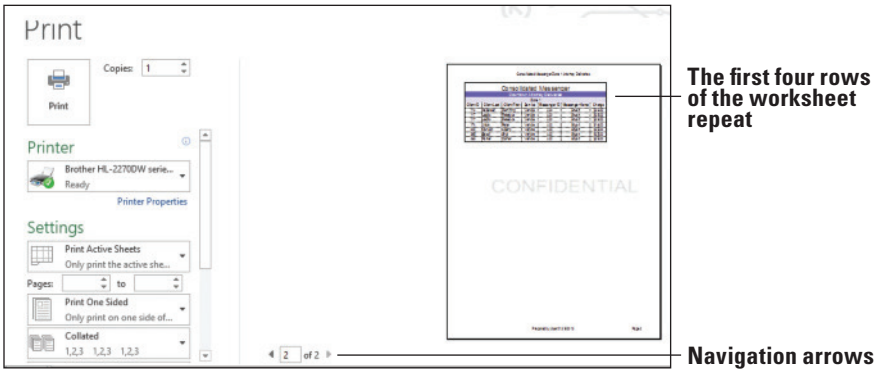
CERTIFICATION READY? 1.5.5

How do you repeat headers and footers?

5. Click **Print Preview**. The Print Preview window appears. Click the **right-facing arrow** at the bottom of the screen to advance to the second page. The first four rows of the worksheet appear on the second page (see Figure 7-29). Click the **left-facing arrow** to return to the preview of page 1.

Figure 7-29

Print Preview shows that the first four rows of the worksheet appear on the second page.



6. Click the **Back** button to return to the worksheet.
7. SAVE the workbook and CLOSE the file.

PAUSE. LEAVE Excel open to use in the next exercise.

PREPARING A DOCUMENT FOR PRINTING

Bottom Line

When worksheet data prints on more than one page, you can use several commands to set up your document to print in a well-organized and easy-to-read manner. The Page Break Preview command on the VIEW tab controls where page breaks occur, enabling you to break data where it is most logical. You can also change page margins, change the orientation of the worksheet, and scale the worksheet to fit more data on a single page.

CERTIFICATION READY? 1.5.7

How do you prepare a workbook for printing?

Adding and Moving a Page Break

The Print window in Backstage displays a full-page preview of a worksheet just as it will be printed. With Print Preview, you can check the format and overall layout of a worksheet before actually printing it. You cannot make changes to the document in Print Preview, however.

A **page break** is a divider that breaks a worksheet into separate pages for printing. Excel inserts automatic vertical page breaks (shown as a dashed line) based on paper size, margin settings, scaling options, and the positions of any manual page breaks (shown as a solid line) that you insert. Excel provides a **Page Break Preview** window in which you can quickly adjust automatic page breaks to achieve a more desirable printed document.

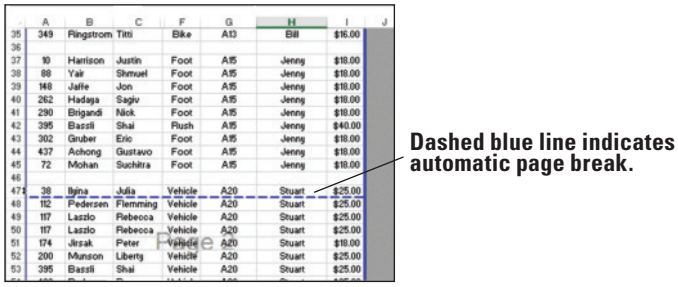
STEP BY STEP **Add and Move a Page Break**

GET READY. LAUNCH Excel if it is not already running.

1. OPEN the ***07 Messenger Print*** data file for this lesson.
2. Ensure Sheet1 is active.
3. On the VIEW tab, in the Workbook Views group, click **Page Break Preview**. Scroll down to view the entire print area. Notice that a dashed blue line appears after row 47 (see Figure 7-30). The dashed line is an automatic page break inserted by Excel.

Figure 7-30

Page Break Preview showing a horizontal page break



4. Click and hold the horizontal **automatic page break** and drag it upward so it is now below row 46. The automatic page break is now a manual page break represented by a solid blue line.
5. On the VIEW tab, in the Workbook Views group, click **Normal**.
6. SAVE the workbook as ***07 Messenger Print Solution***.

PAUSE. LEAVE the workbook open to use in the next exercise.

Use manual page breaks to control page break locations. You can drag an automatic page break to a new location to convert it to a manual page break.

Another way to insert a manual page break is to click a cell in the row where you want a page break to occur, then click the PAGE LAYOUT tab. In the Page Setup group, click Breaks and then click Insert Page Break. A horizontal page break appears.

Setting Margins

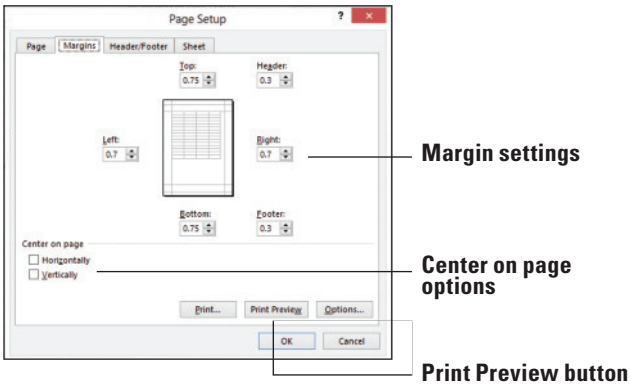
Margins are an effective way to manage and optimize the white space on a printed worksheet. Achieving balance between data and white space adds significantly to the readability and appearance of a worksheet. In Excel, you can choose one of three built-in margin sets, or you can create customized margins using the Page Setup dialog box.

STEP BY STEP Set Margins

GET READY. USE the workbook from the previous exercise.

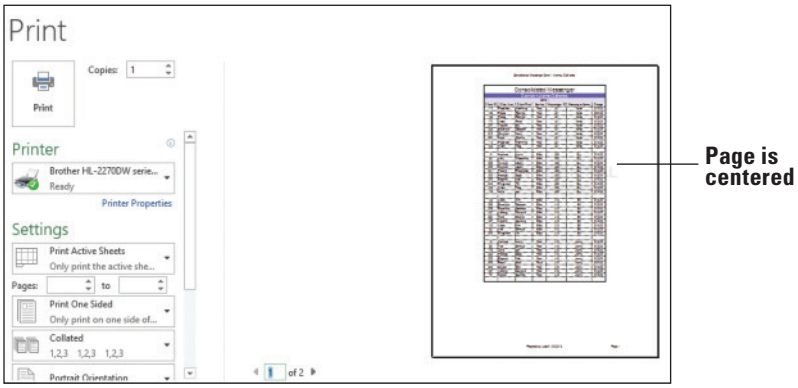
1. Ensure Sheet1 is active and in Normal view.
2. On the PAGE LAYOUT tab, in the Page Setup group, click the **Margins** button arrow to open the Margins menu.
3. At the bottom of the menu, click **Custom Margins**. The Page Setup dialog box opens to the Margins tab, as shown in Figure 7-31.

Figure 7-31
The Page Setup dialog box, Margins tab



4. Change the left and right margins to **1.4**. This will make the margins slightly wider than normal.
5. Check the **Center on page Horizontally** check box. The content in your worksheet will print centered.
6. Click **Print Preview**. The page is centered horizontally, as shown in Figure 7-32.

Figure 7-32
Print Preview shows the page centered horizontally



7. Click the **Back** button to leave Backstage.
8. SAVE the workbook.

PAUSE. LEAVE the workbook open to use in the next exercise.

The Margins menu includes predefined Normal, Wide, and Narrow settings. The Normal margin setting is the default for a new workbook. Narrower margins allow more area for data when you print a workbook, where wider margins will introduce more white space. You can also set custom margins in Excel.

When you click Custom Margins at the bottom of the Margins menu, the Page Setup dialog box opens with the settings that have been applied to the active worksheet. You can change any of the settings to create a custom margin setting. Header and footer margins automatically adjust when you change the page margins.

Worksheets that do not fill an entire page can be centered vertically and horizontally, thereby evenly distributing the page's white space. Use the Margins tab of the Page Setup dialog box to set these features.

To quickly remove all manual page breaks from a worksheet, on the PAGE LAYOUT tab, in the Page Setup group, click the Breaks arrow button and select Reset All Page Breaks.

Setting a Worksheet's Orientation

Printed worksheets are easiest to read and analyze when all of the data appears on one piece of paper. Excel's orientation and scaling features give you control over the number of printed pages of worksheet data. You can change the **orientation** of a worksheet, which is the position of the content, so that it prints either vertically or horizontally on a page. A worksheet that is printed vertically uses the Portrait orientation, which is the default setting. A worksheet printed horizontally uses the Landscape orientation.

STEP BY STEP Set a Worksheet's Orientation

GET READY. USE the workbook from the previous exercise.

1. Ensure Sheet1 is active and in Normal view.
2. On the PAGE LAYOUT tab, in the Page Setup group, click **Orientation** and then click **Landscape**.
3. Click the **FILE** tab, and then click **Print**. Click through the pages to see the worksheet in Landscape orientation. If you decided to keep this orientation, you would need to adjust page breaks to display all content properly.
4. Click the **Back** button to leave Backstage.
5. Repeat Step 2 to change the orientation back to **Portrait**.

PAUSE. LEAVE the workbook open to use in the next exercise.

Orientation is the way your workbook or worksheet appears on the printed page. There are two settings: Portrait and Landscape. Portrait is a vertical printing of the workbook, and Landscape is the horizontal aspect. By default, all workbooks and worksheets are printed in Portrait. Use the Landscape orientation when the width of the area you want to print is greater than the height. Data is easier to read when all the columns fit on one page. This can often be accomplished by changing a worksheet's orientation to Landscape. When you can't fit all of the data on one printed

page by changing the orientation, you can shrink or reduce it using Excel's scaling options, as described in the next exercise.

Scaling a Worksheet to Fit on a Printed Page

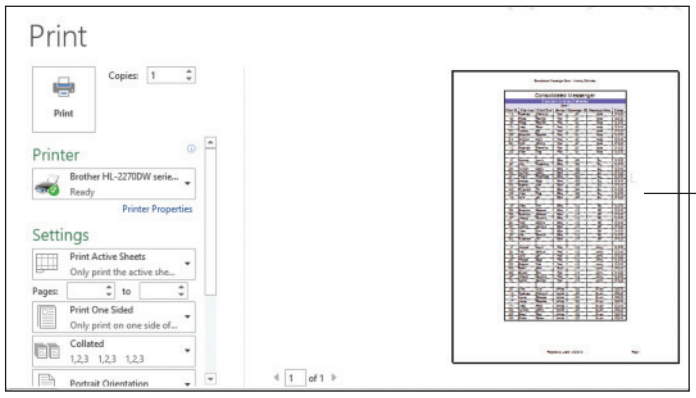
Scaling refers to shrinking or stretching printed output to a percentage of its actual size. One use for scaling is to resize a document so that it fits on a single page. Before attempting to change the scaling for a worksheet's output, the maximum width and height must be set to Automatic.

STEP BY STEP Scale a Worksheet to Fit on a Printed Page

GET READY. USE the workbook from the previous exercise.

1. Ensure Sheet1 is active and in Normal view.
2. On the PAGE LAYOUT tab, in the Page Setup group, click **Orientation** and verify that Portrait is selected.
3. In the Scale to Fit group, click the **Height** arrow and select **1 page**. The scale of the worksheet is reduced so that all rows fit on the same page.
4. Click the **FILE** tab, and then click **Print**. Notice that all rows appear on the page and that the content is smaller than it was previously, as shown in Figure 7-33. When output is reduced, it shrinks the height and width proportionally.

Figure 7-33
Viewing the worksheet after scaling it to fit on one page



5. SAVE the workbook and CLOSE the file.

CLOSE Excel.

CERTIFICATION READY? 1.5.4

How do you set print scaling?

The most common reason for scaling a worksheet is to shrink it so that you can print it on one page. You can also enlarge the sheet so that data appears bigger and fills up more of the printed page. When the Width and Height boxes are set to Automatic, you can click the arrows in the Scale box to increase or decrease scaling of the printout. Each time you click the arrow, the scaling changes by 5%.

Take Note The Width and Height settings must be set to Automatic if you want to specify a scale, such as 75%.

SKILL SUMMARY

In this lesson you learned how:	Exam Objective	Objective Number
To work with columns and rows.	Insert and delete columns and rows.	1.3.3
	Adjust row height and column width.	1.3.5
	Hide columns and rows.	1.4.2
	Transpose columns and rows.	2.3.3
To use themes.	Change workbook themes.	1.3.4
To modify a worksheet's onscreen and printed appearance.	Modify page setup.	1.3.2
To insert headers and footers.	Insert headers and footers.	1.3.7
	Insert watermarks.	1.3.6
	Repeat headers and footers.	1.5.5
To prepare a document for printing.	Set print scaling.	1.5.4
	Configure workbooks to print.	1.5.7

Knowledge Assessment

Multiple Choice

Select the best response for the following statements.

1. How do you increase or decrease a column's width?
   a. Right-click anywhere in the column and select Format Cells.
   b. Use the Page Setup dialog box.
   c. Drag the boundary next to the column heading.
   d. Select a Width setting in the Scale to Fit group on the PAGE LAYOUT tab.
2. Which should you do before formatting an entire row or column?
   a. Click the row heading or column heading to select it.
   b. Open Print Preview.
   c. Go into Page Layout view.
   d. Select a cell range.
3. Which dialog box do you use to transpose rows and columns?
   a. Page Setup
   b. Paste Special
   c. Column Width
   d. Row Height
4. Which of the following can you *not* modify when customizing a document theme?
   a. Colors
   b. Fonts
   c. Effects
   d. Page orientation

5. Where are check boxes you can select to view or print gridlines?
   a. In Print Preview
   b. On the HOME tab, in the Cells group
   c. On the PAGE LAYOUT tab, in the Sheet Options group
   d. On the PAGE LAYOUT tab, in the Page Setup group
6. Which Excel feature or view lets you drag automatic page breaks, converting them to manual page breaks, to achieve a more desirable printed document?
   a. Print Preview
   b. Page Break Preview
   c. Page Layout view
   d. Normal view
7. Which feature do you use to repeat column A on every page when printing a multiple-page worksheet?
   a. Print Titles
   b. Page Break Preview
   c. A header
   d. Custom margins
8. Which is *not* a predefined margin setting?
   a. Normal
   b. Large
   c. Narrow
   d. Wide
9. How do you unhide a hidden row or column?
   a. Select a range of cells in the row or column, right-click, and select Unhide.
   b. Use the Page Setup dialog box.
   c. Remove all page breaks.
   d. Select the rows/columns before and after the hidden rows/columns and then right-click and select Unhide.
10. A worksheet is a little too wide to print on one page. Which feature can you use to force all data to print on one page?
    a. A page break
    b. The Wide margin setting
    c. Scale to Fit
    d. Commands in the Sheet Options group on the PAGE LAYOUT tab

Fill in the Blank

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

1. _____ are the lines that display around worksheet cells.
2. The _____ is the line between rows or columns.
3. A(n) _____ is a line of text that appears at the top of each page of a printed worksheet.
4. _____ a row or column causes your cell data to change orientation. Row data will become column data, and column data will become row data.
5. _____ is the top-to-bottom measurement of a row, measured in points.
6. The identifying letter at the top of a column is called the _____.
7. _____ refers to shrinking or stretching printed output to a percentage of its actual size.
8. A(n) _____ is a predefined set of colors, fonts, and effects that can be applied to an entire workbook or to specific items within a workbook, such as charts or tables.
9. You can change the _____ of a worksheet, which is the position of the content, so that it prints either vertically or horizontally on a page.
10. A(n) _____ is a divider that breaks a worksheet into separate pages for printing.

Competency Assessment

Project 7-1: Practice Working with Rows and Columns

Use the worksheet for the School of Fine Arts to practice working with rows and columns.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***07 Fine Art*** from the data files for this lesson.
2. Click the **column D** heading to select the entire column.
3. On the HOME tab, in the Cells group, click the **Format** button arrow, point to **Hide & Unhide**, and select **Hide Columns**. Column D is now hidden.
4. Click the column B heading to select the entire column.
5. On the HOME tab, in the Cells group, click the **Format** button arrow and select **Column Width**. In the Column Width dialog box, type **11** in the Column width text box and click **OK**.
6. Double-click the **double boundary** between column headings C and E. Column D appears.
7. Click the **row 11** heading, right-click, and select **Insert**.
8. Enter the following in the blank row:

First	*Last*	*Discipline*	*Enrollment Date*	*GPA*
Bruce	**Keever**	**Sculpture**	**10/15/2012**	**=SUM(3.4+3.5+3.7)/3**

9. Click the **plus (+) sign** to the right of Sheet1 to create a new, blank worksheet.
10. Click **Sheet1**, select **A2:E15**, and press **Ctrl + C** to copy the content to the Clipboard.
11. Click **Sheet2**, and then click cell **A1**.
12. On the HOME tab, in the Clipboard group, click the **Paste** button arrow and select **Paste Special**. The Paste Special dialog box opens.
13. Check the **Transpose** check box, and click **OK**.
14. In Sheet2, select **all content**.
15. On the HOME tab, in the Cells group, click the **Format** button arrow, and select **AutoFit Column Width**.
16. Click **Sheet1**.
17. SAVE the workbook as ***07 Fine Art Solution*** and CLOSE the file.

LEAVE Excel open for the next project.

Project 7-2: Change and Customize a Theme

You work for Wingtip Toys and have been asked to modify a sales worksheet to make it match the company color and font scheme.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***07 Wingtip Toys*** from the data files for this lesson.
2. On the PAGE LAYOUT tab, in the Themes group, click the **Themes** button arrow to open the Themes menu.
3. Find and select the **Slice** theme.
4. In the Themes group, click **Colors**.
5. Scroll down and select the **Slipstream** color scheme.
6. On the PAGE LAYOUT tab, in the Themes group, click **Fonts**.
7. Locate the **Gill Sans MT** font and select it.
8. Click **Fonts** in the Themes group and select **Customize Fonts**.

9. Open the **Heading font** drop-down menu and select **Arial**. Click **Save**.
10. On the PAGE LAYOUT tab, in the Themes group, click **Themes** and then click **Save Current Theme**. The Save Current Theme dialog box opens.
11. In the File name box, type **WingTipToys** and click **Save**.
12. SAVE the workbook as ***07 Wingtip Toys Solution*** and CLOSE the file.

LEAVE Excel open for the next project.

Take Note Remember, you can delete a customized theme by opening the Themes gallery, right-clicking the custom theme at the top of the gallery, and then selecting Delete from the shortcut menu. Similar steps apply to customized color schemes and font schemes. However, it's recommended that you don't delete customizations until you're finished with the course.

Proficiency Assessment

Project 7-3: Modify the Appearance of a Worksheet

Albert, the CEO's administrative assistant at A. Datum, asked you to help him prepare documents to email to board members. Albert wants to enhance the appearance of the A. Datum sales worksheet, which will be viewed onscreen and may be printed.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***07 ADatum Appearance*** from the data files for this lesson.
2. On the PAGE LAYOUT tab, in the Page Setup group, click the **Background** button. The Insert Pictures dialog box opens.
3. Next to From a file, click **Browse**. The Sheet Background dialog box opens.
4. Navigate to the student data files folder, select *07 confidential.png*, and then click **Insert**.
5. On the PAGE LAYOUT tab, in the Sheet Options group, uncheck the **Gridlines View** check box. The gridlines disappear from the worksheet.
6. Check the **Gridlines View** check box to restore viewable gridlines.
7. On the PAGE LAYOUT tab, in the Page Setup group, click the **Dialog Box Launcher**. The Page Setup dialog box opens.
8. Click the **Margins** tab.
9. Check the **Center on page Horizontally** check box and the **Vertically** check box.
10. Click **Print Preview**. Verify that the content is centered horizontally and vertically, and then click the **Back** button to exit Print Preview.
11. SAVE the workbook as ***07 ADatum Appearance Solution*** and CLOSE the file.

LEAVE Excel open for the next project.

Project 7-4: Insert Headers and Footers

Albert has returned for additional help with the A. Datum sales worksheet. He wants to make a few formatting changes and add a header and footer to the worksheet.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***07 ADatum Header-Footer*** from the data files for this lesson.
2. Select **A1:E1**, and then on the HOME tab, in the Alignment group, click **Merge & Center**.
3. Select columns B through E. Center all content. You might have to click Center

twice because some of the selected data is already centered. The first click removes centering for those cells, and the second click applies it to all selected cells.

4. On the PAGE LAYOUT tab, in the Page Setup group, click the **Dialog Box Launcher**. In the Page Setup dialog box, click the **Margins** tab.
5. Uncheck the **Center on page Vertically** check box. Click **OK**.
6. Click in row **10**. On the PAGE LAYOUT tab, in the Page Setup group, click **Breaks** and select **Insert Page Break**.
7. On the INSERT tab, in the Text group, click **Header & Footer**. Type the text **A. Datum March 2013 Board Meeting** in the center header text box.
8. Click the **Go to Footer** button in the Navigation group. With the cursor in the center footer text box, click **Footer** in the Header & Footer group and select **Confidential, <date>, Page 1**.
9. Click outside of the header area, on the status bar, click the **Normal** view icon.
10. Preview the worksheet for printing.
11. SAVE the workbook as ***07 ADatum Header-Footer Solution*** and CLOSE the file.

LEAVE Excel open for the next project.

Mastery Assessment

Project 7-5: Enhance a Worksheet and Prepare for Printing

Margie's Travel is an agency that sells travel-related products and services to clients on behalf of third parties such as airlines, hotels, and cruise lines. You are preparing a worksheet that lists a variety of cruises for Fabrikam, an important client.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***07 Cruises*** from the data files for this lesson.
2. Remove the background image from the worksheet.
3. Change the orientation of the worksheet to **Landscape**.
4. Change the margin setting to **Narrow**.
5. Change the document theme to **Banded**.
6. Center the worksheet horizontally for printing.
7. Preview the worksheet for printing.
8. SAVE the workbook as ***07 Cruises Solution*** and CLOSE the file.

LEAVE Excel open for the next project.

Project 7-6: Formatting a Payroll Worksheet

Contoso, Ltd. is a busy family practice clinic that recently expanded its operations to a second location. You are formatting a payroll worksheet.

GET READY. LAUNCH Excel if it is not already running.

1. OPEN ***07 Payroll*** from the data files for this lesson.
2. AutoFit all columns so that all data is viewable.
3. Change the row height of rows 3 through 33 to **18**.
4. Change the theme to **Wisp**.

5. Set rows 1 through 3 to repeat on every page, anticipating that additional rows will be added to a future revision of the worksheet.
6. Insert a footer that includes the file name and page number.
7. Configure gridlines to appear in printed worksheets.
8. Scale the width of the worksheet to fit on one page.
9. Preview the worksheet for printing.
10. SAVE the workbook as ***07 Payroll Solution*** and CLOSE the file.

CLOSE Excel.