

For an introduction to Windows and instructions about how to perform basic Windows tasks, read the Office and Windows module at the beginning of this book, where you can learn how to resize windows, change screen resolution, create folders, move and rename files, use Windows Help, and much more.

For an introduction to Office and instructions about how to perform basic tasks in Office apps, read the Office and Windows module at the beginning of this book, where you can learn how to run an application, use the ribbon, save a file, open a file, print a file, exit an application, use Help, and much more.

Repair and Maintenance expenses assumption by 1%. Being able to analyze the effect of changing values in a worksheet is an important skill in making business decisions.

Worksheets are normally much larger than those you created in the previous modules, often extending beyond the size of the Excel window. When you cannot view the entire worksheet on the screen at once, working with a large worksheet can be frustrating. This module introduces several Excel commands that allow you to control what is displayed on the screen so that you can focus on critical parts of a large worksheet. One command allows you to freeze rows and columns so that they remain visible, even when you scroll. Another command splits the worksheet into separate panes so that you can view different parts of a worksheet on the screen at once. Another changes the magnification to allow you to see more content, albeit at a smaller size. This is useful for reviewing the general layout of content on the worksheet.

From your work in Module 1, you know how easily you can create charts in Excel. This module covers additional charting techniques that allow you to convey meaning visually, such as by using sparkline charts or clustered column charts. This module also introduces the Accessibility checker.

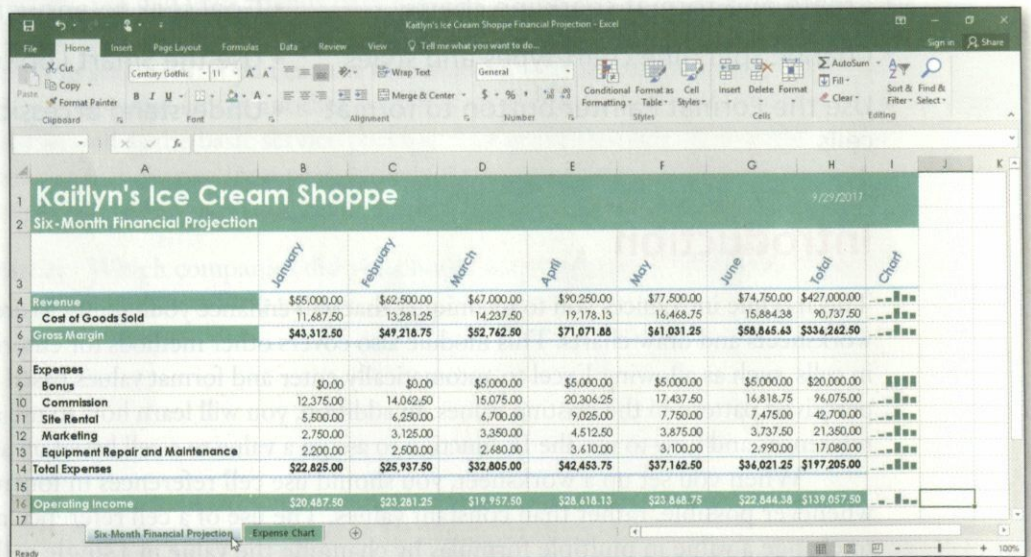
Project — Financial Projection Worksheet with What-If Analysis and Chart

The project in this module uses Excel to create the worksheet and clustered column chart shown in Figures 3-1a and 3-1b. Kaitlyn's Ice Cream Shoppe operates kiosks at colleges and universities and serves both hard and soft serve ice cream. Each December and June, the chief executive officer projects monthly sales revenues, costs of goods sold, gross margin, expenses, and operating income for the upcoming six-month period, based on figures from the previous six months. The CEO requires an easy-to-read worksheet that shows financial projections for the upcoming six months to use for procuring partial financing and for determining staffing needs. The worksheet should allow for quick analysis, if projections for certain numbers change, such as the percentage of expenses

BTW

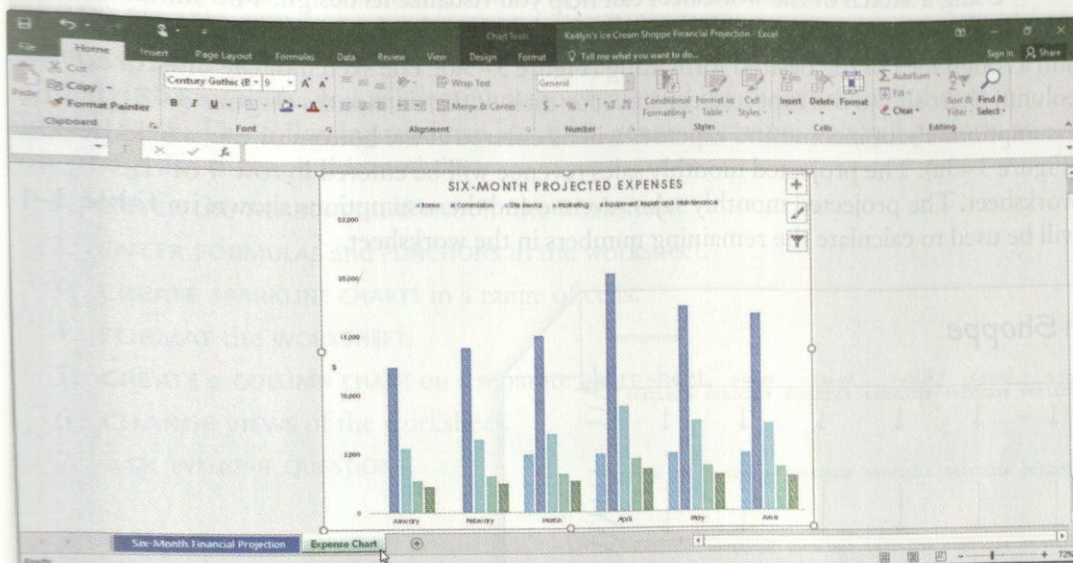
Excel Screen Resolution

If you are using a computer or mobile device to step through the project in this module and you want your screens to match the figures in this book, you should change your screen's resolution to 1366 x 768. For information about how to change a computer's resolution, refer to the Office and Windows module at the beginning of this book.



(a) Worksheet

Figure 3-1



(b) Clustered Column Chart

Figure 3-1 (Continued)

allocated to commission or the cost of the kiosk rentals. In addition, you need to create a column chart that shows the breakdown of expenses for each month in the period.

The requirements document for the Kaitlyn's Ice Cream Shoppe Six-Month Financial Projection worksheet is shown in Figure 3-2. It includes the needs, source of data, summary of calculations, and chart requirements.

Worksheet Title	Kaitlyn's Ice Cream Shoppe Six-Month Financial Projection
Needs	- A worksheet that shows Kaitlyn's Ice Cream Shoppe projected monthly sales revenue, cost of goods sold, gross margin, expenses, and operating income for a six-month period. - A clustered column chart that shows the expected contribution of each expense category to total expenses.
Source of Data	Data supplied by the business owner includes projections of the monthly sales and expenses based on prior year figures (see Table 3-1). Remaining numbers in the worksheet are based on formulas.
Calculations	The following calculations are needed for each month: - Cost of Goods Sold = Revenue * (1 - Margin) - Gross Margin = Revenue - Cost of Goods Sold - Bonus expense = Predetermined bonus amount if Revenue exceeds the Revenue for Bonus, otherwise Bonus = 0 - Commission expense = Commission percentage × Revenue - Site Rental expense = Kiosk Rental Percentage × Revenue - Marketing expense = Marketing percentage × Revenue - Equipment Repair and Maintenance expense = Equipment Repair and Maintenance percentage × Revenue - Total expenses = sum of all expenses - Operating Income = Gross Margin - Total expenses
Chart Requirements	- Show sparkline charts for revenue and each of the items noted in the calculations area above. - Show a clustered column chart that shows the contributions of each month's expense categories to the total monthly expense figure.

Figure 3-2

BTW

Touch Screen Differences

The Office and Windows interfaces may vary if you are using a touch screen. For this reason, you might notice that the function or appearance of your touch screen differs slightly from this module's presentation.

Using a sketch of the worksheet can help you visualize its design. The sketch of the worksheet consists of titles, column and row headings, location of data values, calculations, and a rough idea of the desired formatting (Figure 3–3a). The sketch of the clustered column chart shows the expected expenses for each of the six months (Figure 3–3b). The assumptions about income and expenses will be entered at the bottom of the worksheet (Figure 3–3a). The projected monthly sales revenue will be entered in row 4 of the worksheet. The projected monthly sales revenue and the assumptions shown in Table 3–1 will be used to calculate the remaining numbers in the worksheet.

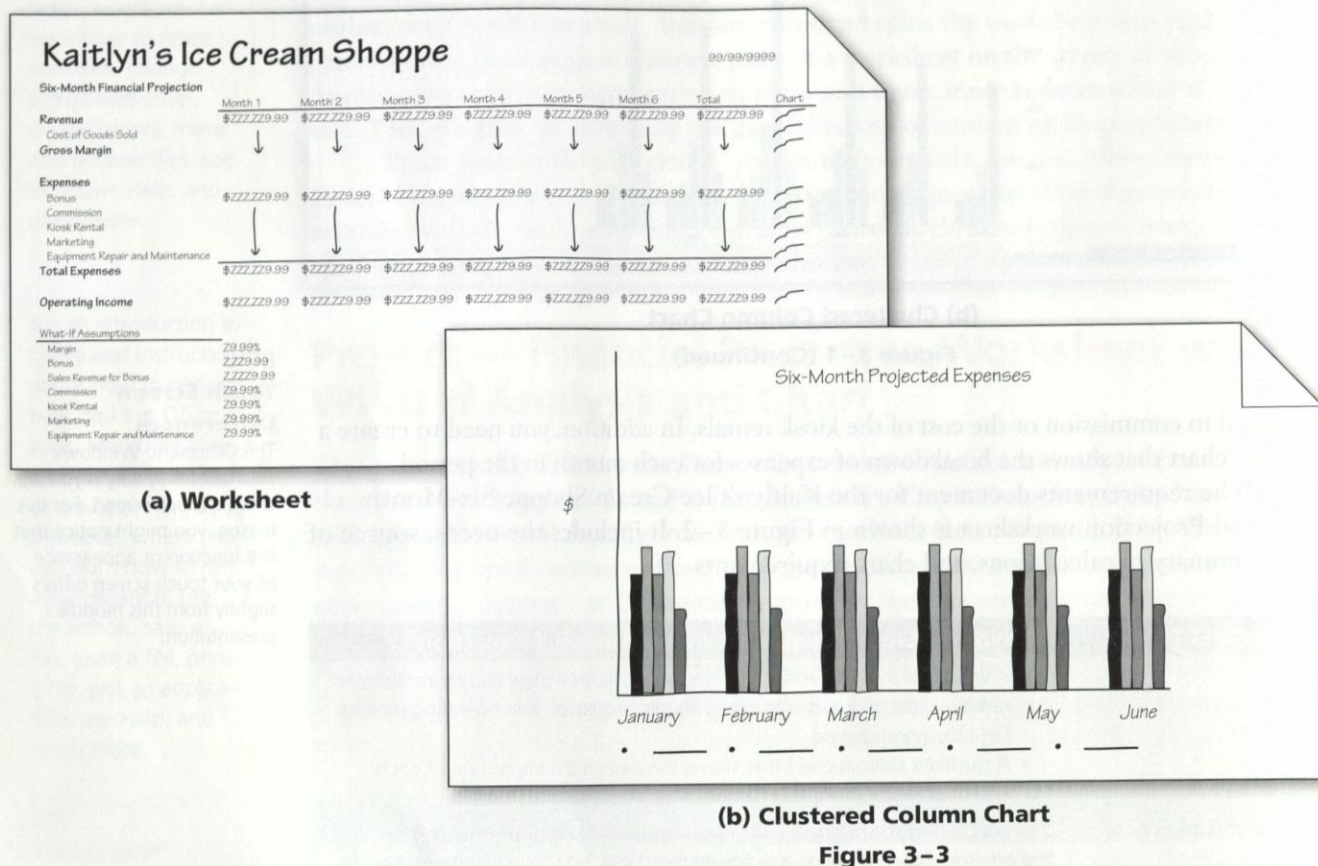


Table 3–1 Kaitlyn's Ice Cream Shoppe Six-Month Financial Projections Data and What-If Assumptions

Projected Monthly Total Sales Revenues

January	55,000.00
February	62,500.00
March	67,000.00
April	90,250.00
May	77,500.00
June	74,750.00

What-If Assumptions

Margin	78.75%
Bonus	\$3,500.00
Sales Revenue for Bonus	65,000.00
Commission	25.00%
Site Rental	10.00%
Marketing	5.00%
Equipment Repair and Maintenance	3.50%

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

In this module, you will learn how to create and use the workbook shown in Figure 3–1. The following roadmap identifies general activities you will perform as you progress through this module:

1. **ENTER** the **HEADINGS** and **DATA** in the worksheet.
2. **ENTER FORMULAS** and **FUNCTIONS** in the worksheet.
3. **CREATE SPARKLINE CHARTS** in a range of cells.
4. **FORMAT** the **WORKSHEET**.
5. **CREATE** a **COLUMN CHART** on a separate chart sheet.
6. **CHANGE VIEWS** of the worksheet.
7. **ASK WHAT-IF QUESTIONS**.

To Enter the Worksheet Titles and Apply a Theme

The worksheet contains two titles in cells A1 and A2. In the previous modules, titles were centered across the worksheet. With large worksheets that extend beyond the size of a window, it is best to leave titles left-aligned, as shown in the sketch of the worksheet in Figure 3–3a, so that the worksheet will print the title on the first page if the worksheet requires multiple pages. This allows the user to easily find the worksheet title when necessary. The following steps enter the worksheet titles and change the workbook theme to Savon.

- 1 Run Excel and create a blank workbook in the Excel window.
- 2 Select cell A1 and then type **Kaitlyn's Ice Cream Shoppe** as the worksheet title.
- 3 Select cell A2, type **Six-Month Financial Projection** as the worksheet subtitle, and then press the ENTER key to enter the worksheet subtitle.
- 4 Apply the Savon theme to the workbook.

Rotating Text and Using the Fill Handle to Create a Series

The data on the worksheet, including month names and the What-If Assumptions section, now can be added to the worksheet.

What should you take into account when planning a worksheet layout?

Using Excel, you can change text and number formatting in many ways, which affects the visual impact of the worksheet. Rotated text often provides a strong visual appeal. Rotated text also allows you to fit more text into a smaller column width. When laying out a worksheet, keep in mind the content you want to emphasize and the length of the cell titles relative to the numbers.

BTW

Excel Help

At any time while using Excel, you can find answers to questions and display information about various topics through Excel Help. Used properly, this form of assistance can increase your productivity and reduce your frustrations by minimizing the time you spend learning how to use Excel. For instructions about Excel Help and exercises that will help you gain confidence in using it, read the Office and Windows module at the beginning of this book.

BTW

The Ribbon and Screen Resolution

Excel may change how the groups and buttons within the ribbon appear on the ribbon, depending on the computer or mobile device's screen resolution. Thus, your ribbon may look different from the ones in this book if you are using a screen resolution other than 1366 x 768.

BTW

Rotating Text in a Cell

In Excel, you use the Alignment sheet in the Format Cells dialog box (shown in Figure 3–5) to position data in a cell by centering, left-aligning, or right-aligning; indenting; aligning at the top, bottom, or center; and rotating. If you enter 90 in the Degrees box in the Orientation area, the text will appear vertically and read from bottom to top in the cell.



CONSIDER THIS

To Rotate Text in a Cell

The design of the worksheet calls specifically for data for the six months of the selling season. Because there always will be only six months of data in the worksheet, place the months across the top of the worksheet as column headings rather than as row headings. Place the income and expense categories in rows, as they are more numerous than the number of months. This layout allows you to easily navigate the worksheet. Ideally, a proper layout will create a worksheet that is longer than it is wide.

When you first enter text, its angle is zero degrees (0°), and it reads from left to right in a cell. Excel allows you to rotate text in a cell counterclockwise by entering a number between 1° and 90° . *Why? Rotating text is one method of making column headings visually distinct.* The following steps enter the month name, January, in cell B3 and format cell B3 by rotating the text.

1

- If necessary, click the Home tab and then select cell B3 because this cell will include the first month name in the series of month names.
- Type **January** as the cell entry and then click the Enter button.
- Click the Alignment Settings Dialog Box Launcher (Home tab | Alignment group) to display the Format Cells dialog box (Figure 3-4).

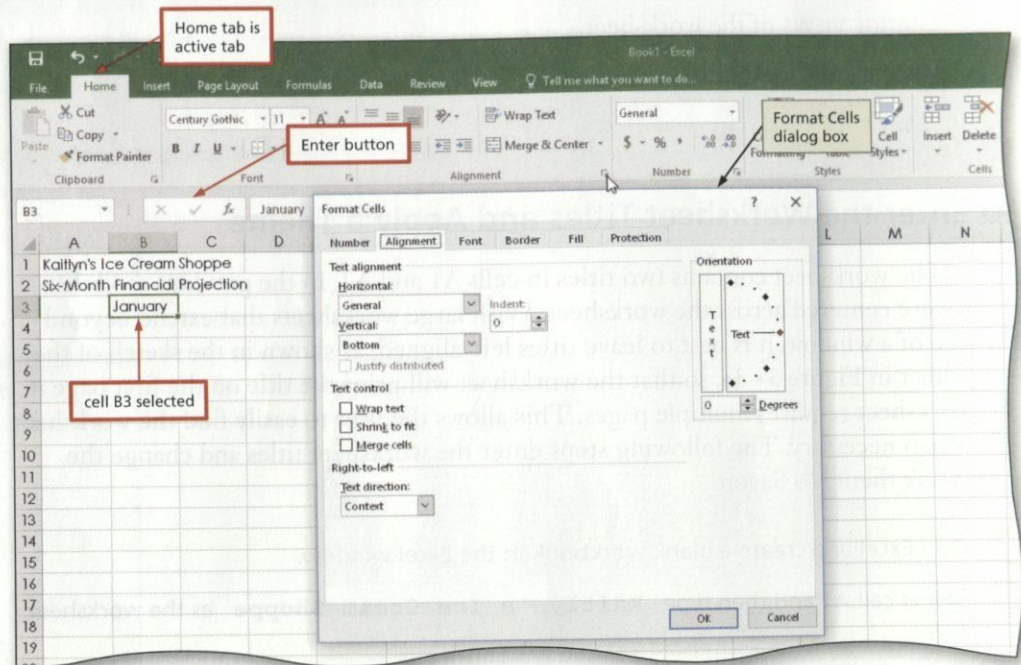


Figure 3-4

2

- Click the 60° point in the Orientation area (Format Cells dialog box) to move the indicator in the Orientation area to the 60° point and display a new orientation in the Degrees box (Figure 3-5).

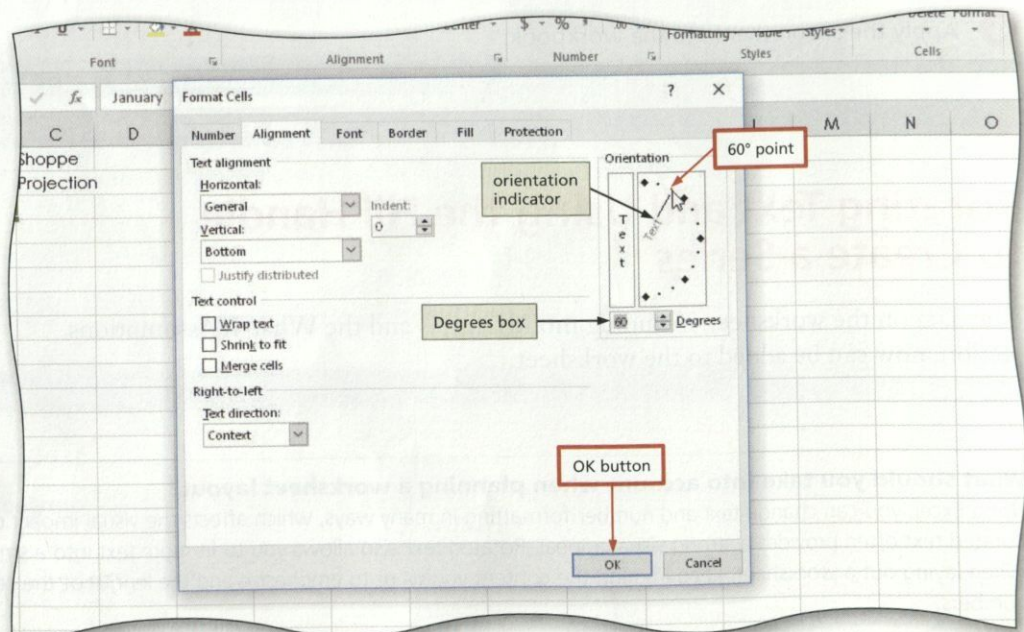


Figure 3-5

- 3**
- Click the OK button (Format Cells dialog box) to rotate the text in the active cell and increase the height of the current row to best fit the rotated text (Figure 3-6).

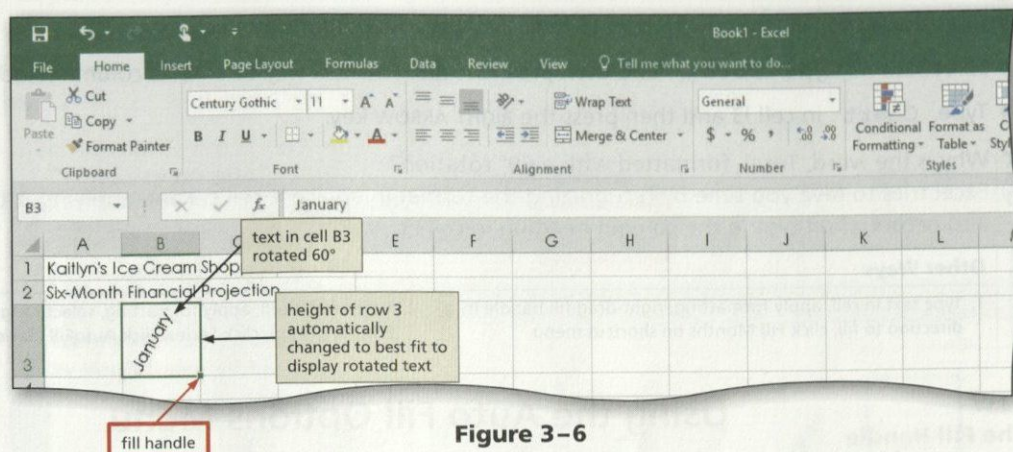


Figure 3-6

Other Ways

1. Right-click selected cell, click Format Cells on shortcut menu, click Alignment tab (Format Cells dialog box), click 60° point, click OK button

To Use the Fill Handle to Create a Series of Month Names

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? Once the first month in the series has been entered and formatted, you can complete the data series using the fill handle rather than typing and formatting all the entries. The following steps use the fill handle and the entry in cell B3 to create a series of month names in cells C3:G3.

- 1**
- Drag the fill handle on the lower-right corner of cell B3 to the right to select the range to fill, C3:G3 in this case. Do not release the mouse button (Figure 3-7).

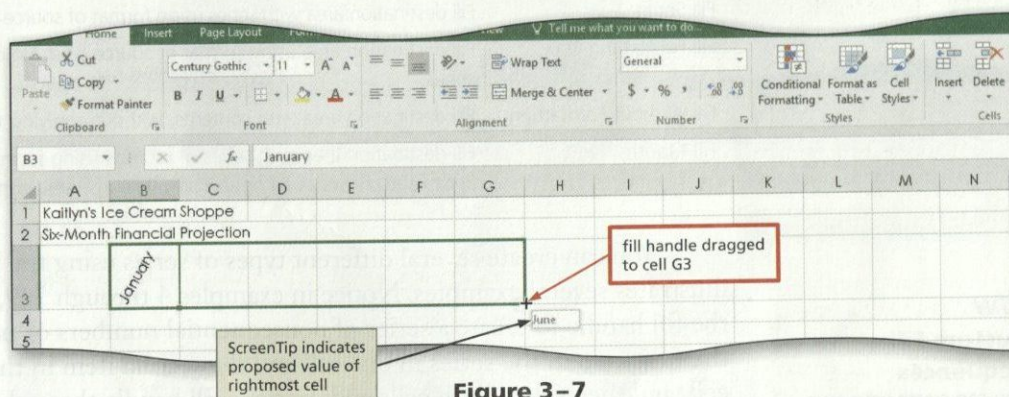


Figure 3-7

- 2**
- Release the mouse button to create a month name series in the selected range and copy the format of the selected cell to the selected range.
 - Click the 'Auto Fill Options' button below the lower-right corner of the fill area to display the Auto Fill Options menu (Figure 3-8).

Q&A What if I do not want to copy the format of cell B3 during the auto fill operation?
In addition to creating a series of values, dragging the fill handle instructs Excel to copy the format of cell B3 to the range C3:G3. With some fill operations, you may not want to copy the formats of the source cell or range to the destination cell or range. If this is the case, click the 'Auto Fill Options' button after the range fills and then select the desired option on the Auto Fill Options menu (Figure 3-8).

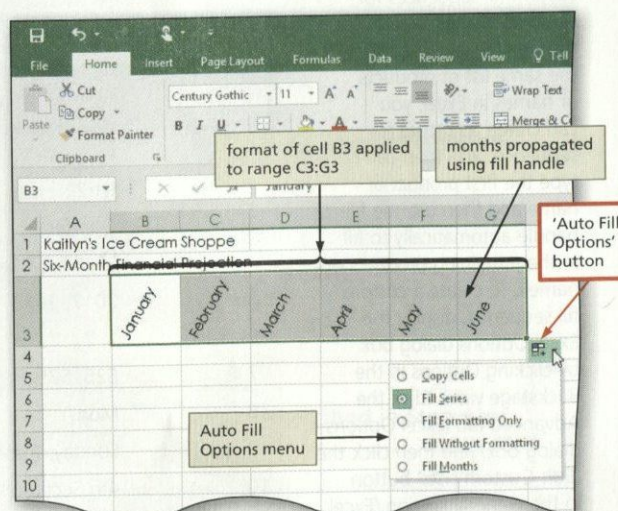


Figure 3-8

3

- Click the 'Auto Fill Options' button to hide the Auto Fill Options menu.
- Select cell H3, type **Total**, and then press the RIGHT ARROW key to enter a column heading.
- Type **Chart** in cell I3 and then press the RIGHT ARROW key.

Q&A

Why is the word, Total, formatted with a 60° rotation?

Excel tries to save you time by recognizing the format in adjacent cell G3 and applying it to cell H3. Such behavior also occurs when typing the column heading in cell I3.

Other Ways

1. Type text in cell, apply formatting, right-drag fill handle in direction to fill, click Fill Months on shortcut menu
2. Type text in cell, apply formatting, select range, click Fill button (Home tab | Editing group), click Series, click AutoFill (Series dialog box), click OK button

BTW

The Fill Handle

If you drag the fill handle up or to the left, Excel will decrement the series rather than increment the series. To copy a word, such as January or Monday, which Excel might interpret as the start of a series, hold down the CTRL key while you drag the fill handle to a destination area. If you drag the fill handle back into the middle of a cell, Excel erases the contents of the cell.

Using the Auto Fill Options Menu

As shown in Figure 3–8, Fill Series is the default option that Excel uses to fill an area, which means it fills the destination area with a series, using the same formatting as the source area. If you choose another option on the Auto Fill Options menu, Excel changes the contents of the destination range. Following the use of the fill handle, the 'Auto Fill Options' button remains active until you begin the next Excel operation. Table 3–2 summarizes the options on the Auto Fill Options menu.

Table 3–2 Options Available on the Auto Fill Options Menu

Auto Fill Option	Description
Copy Cells	Fill destination area with contents using format of source area. Do not create a series.
Fill Series	Fill destination area with series using format of source area. This option is the default.
Fill Formatting Only	Fill destination area using format of source area. No content is copied unless fill is series.
Fill Without Formatting	Fill destination area with contents, without applying the formatting of source area.
Fill Months	Fill destination area with series of months using format of source area. Same as Fill Series and shows as an option only if source area contains the name of a month.

BTW

Custom Fill Sequences

You can create your own custom fill sequences for use with the fill handle. For example, if you often type the same list of products or names in Excel, you can create a custom fill sequence. You then can type the first product or name and then use the fill handle automatically to fill in the remaining products or names. To create a custom fill sequence, display the Excel Options dialog box by clicking Options in the Backstage view. Click the Advanced tab (Excel Options dialog box) and then click the 'Edit Custom Lists' button in the General section (Excel Options dialog box).

You can create several different types of series using the fill handle. Table 3–3 illustrates several examples. Notice in examples 4 through 7, 9, and 11 that, if you use the fill handle to create a series of nonsequential numbers or months, you must enter the first item in the series in one cell and the second item in the series in an adjacent cell, and then select both cells and drag the fill handle through the destination area.

Table 3–3 Examples of Series Using the Fill Handle

Example	Contents of Cell(s) Copied Using the Fill Handle	Next Three Values of Extended Series
1	4:00	5:00, 6:00, 7:00
2	Qtr2	Qtr3, Qtr4, Qtr1
3	Quarter 1	Quarter 2, Quarter 3, Quarter 4
4	22-Jul, 22-Sep	22-Nov, 22-Jan, 22-Mar
5	2017, 2018	2019, 2020, 2021
6	1, 2	3, 4, 5
7	625, 575	525, 475, 425
8	Mon	Tue, Wed, Thu
9	Sunday, Tuesday	Thursday, Saturday, Monday
10	4th Section	5th Section, 6th Section, 7th Section
11	2205, 2208	2211, 2214, 2217

To Increase Column Widths

Why? In Module 2, you increased column widths after the values were entered into the worksheet. Sometimes, you may want to increase the column widths before you enter values and, if necessary, adjust them later. The following steps increase the column widths.

- 1 Move the pointer to the boundary between column heading A and column heading B so that the pointer changes to a split double arrow in preparation of adjusting the column widths.
- 2 Drag the pointer to the right until the ScreenTip displays the desired column width, Width: 38.00 (309 pixels) in this case. Do not release the mouse button (Figure 3-9).

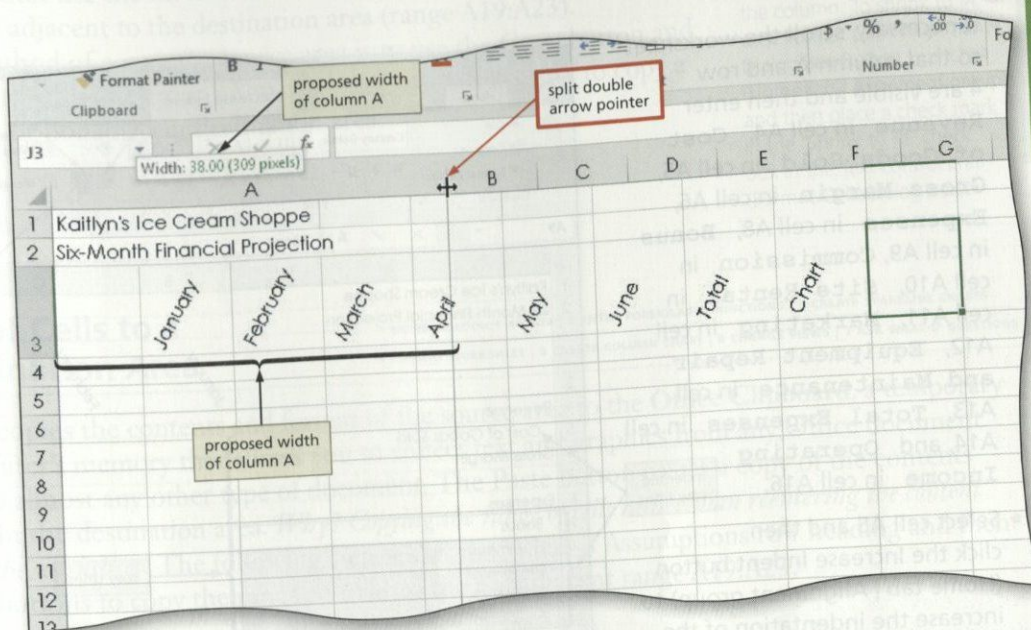


Figure 3-9

- 2 Release the mouse button to change the width of the column.
- 3 Click column heading B to select the column and then drag through column heading G to select the range in which to change the widths.
- 4 Move the pointer to the boundary between column headings B and C in preparation of resizing column B and then drag the pointer to the right until the ScreenTip displays the desired width, Width: 14.50 (121 pixels) in this case. Do not lift your finger or release the mouse button (Figure 3-10).

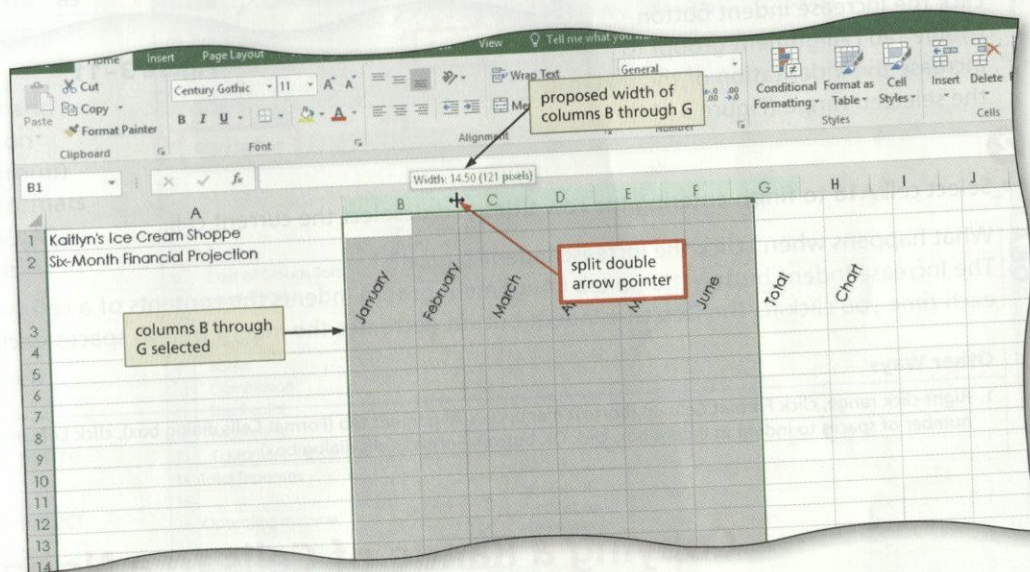


Figure 3-10

- 3 Release the mouse button to change the width of the selected columns.
- 4 If necessary, scroll the worksheet so that column H is visible and then use the technique described in Step 1 to increase the width of column H to 18.00 (149 pixels).

To Enter and Indent Row Titles

Excel allows you to indent text in cells. The following steps enter the row titles in column A and indent several of the row titles to create a visual hierarchy. *Why? You can create a hierarchy by indenting some of the row titles, like in an outline or table of contents.*

1

- If necessary, scroll the worksheet so that column A and row 4 are visible and then enter **Revenue** in cell A4, **Cost of Goods Sold** in cell A5, **Gross Margin** in cell A6, **Expenses** in cell A8, **Bonus** in cell A9, **Commission** in cell A10, **Site Rental** in cell A11, **Marketing** in cell A12, **Equipment Repair and Maintenance** in cell A13, **Total Expenses** in cell A14, and **Operating Income** in cell A16.
- Select cell A5 and then click the **Increase Indent** button (Home tab | Alignment group) to increase the indentation of the text in the selected cell.
- Select the range A9:A13 and then click the **Increase Indent** button (Home tab | Alignment group) to increase the indentation of the text in the selected range (Figure 3–11).

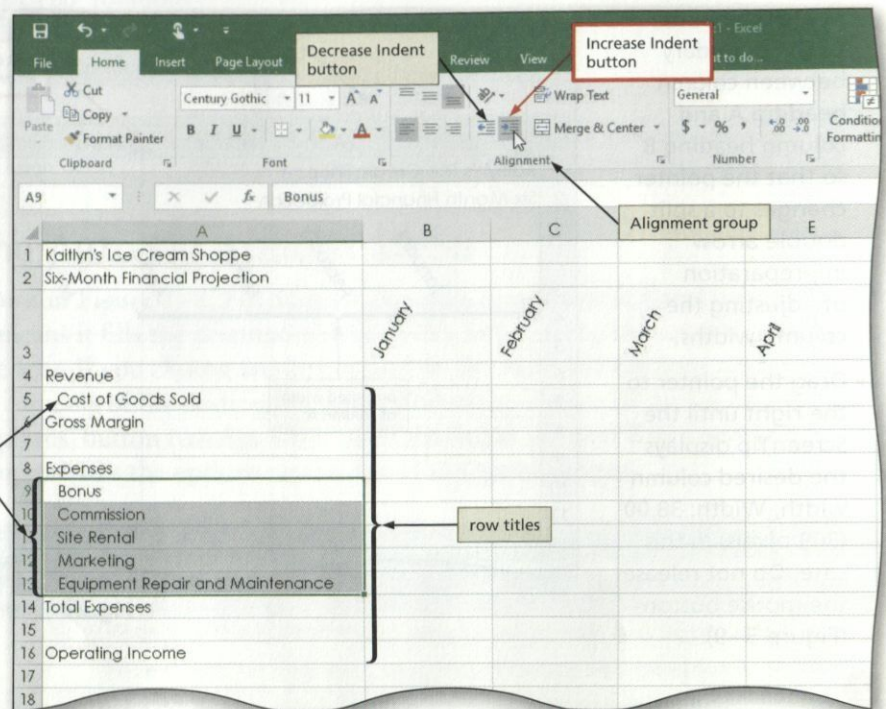


Figure 3–11

2

- Select cell A18 to finish entering the row titles and deselect the current cell.

Q&A What happens when I click the **Increase Indent** button?

The **Increase Indent** button (Home tab | Alignment group) indents the contents of a cell two spaces to the right each time you click it. The **Decrease Indent** button decreases the indent by two spaces each time you click it.

Other Ways

1. Right-click range, click **Format Cells** on shortcut menu, click **Alignment** tab (Format Cells dialog box), click **Left (Indent)** in Horizontal list, type number of spaces to indent in Indent box, click **OK** button (Format Cells dialog box)

Copying a Range of Cells to a Nonadjacent Destination Area

The What-If Assumptions section should be placed in an area of the worksheet that is accessible yet does not impair the view of the main section of the worksheet. As shown in Figure 3–3a, the What-If Assumptions will be placed below the calculations in the worksheet. This will allow the reader to see the main section of the worksheet when first opening the workbook. Additionally, the row titles in the Expenses area are the

same as the row titles in the What-If Assumptions table, with the exception of the two additional entries in cells A19 (Margin) and A21 (Sales Revenue for Bonus). Hence, the row titles in the What-If Assumptions table can be created by copying the range A9:A13 to the range A19:A23 and then inserting two rows for the additional entries in cells A19 and A21. You cannot use the fill handle to copy the range because the source area (range A9:A13) is not adjacent to the destination area (range A19:A23).

A more versatile method of copying a source area is to use the Copy button and Paste button (Home tab | Clipboard group). You can use these two buttons to copy a source area to an adjacent or nonadjacent destination area.

BTW

Fitting Entries in a Cell

An alternative to increasing column widths or row heights is to shrink the characters in a cell to fit the current width of the column. To shrink to fit, click Format Cells Alignment Dialog Box Button Launcher (Home tab | Alignment group) and then place a check mark in the 'Shrink to fit' check box in the Text control area (Format Cells dialog box).

To Copy a Range of Cells to a Nonadjacent Destination Area

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

The Copy button copies the contents and format of the source area to the **Office Clipboard**, a temporary storage area in the computer's memory that allows you to collect text and graphics from any Office document and then paste them into almost any other type of document. The Paste button pastes a copy of the contents of the Office Clipboard in the destination area. *Why? Copying the range of cells rather than reentering the content assures consistency within the worksheet.* The following steps enter the What-If Assumptions row heading and then use the Copy and Paste buttons to copy the range A9:A13 to the nonadjacent range A19:A23.

1

- With cell A18 selected, type **What-If Assumptions** as the new row title and then click the Enter button.
- Select the range A9:A13 and then click the Copy button (Home tab | Clipboard group) to copy the values and formats of the selected range, A9:A13 in this case, to the Office Clipboard.
- Select cell A19, the top cell in the destination area (Figure 3–12).

Q&A Why do I not select the entire destination area? You are not required to select the entire destination area (A19:A23) because Excel only needs to know the upper-left cell of the destination area. In the case of a single column range, such as A19:A23, the top cell of the destination area (cell A19) also is the upper-left cell of the destination area.

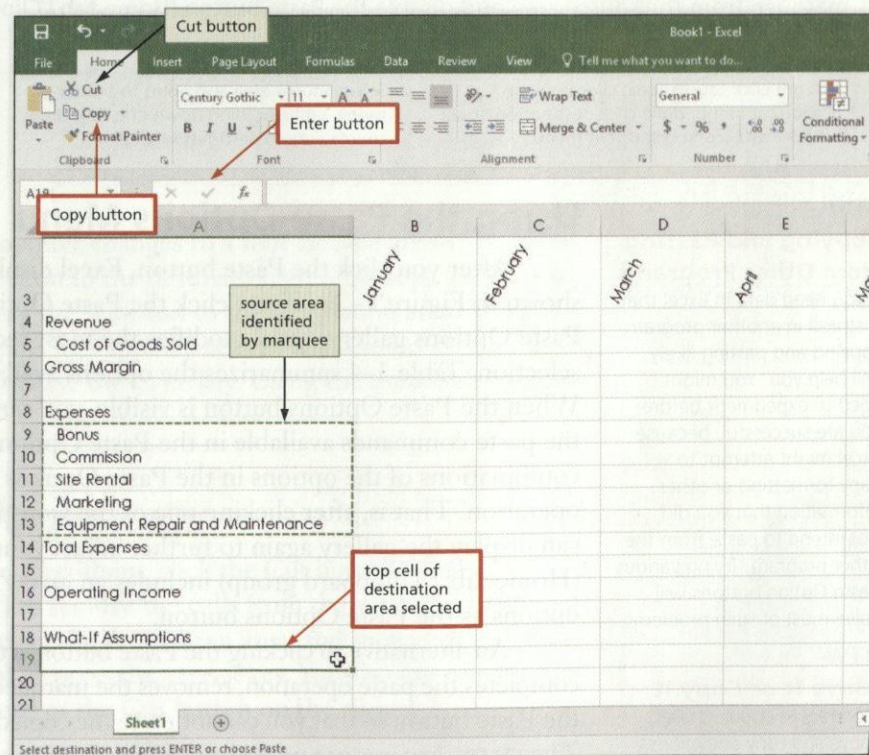


Figure 3–12

2

- Click the Paste button (Home tab | Clipboard group) to copy the values and formats of the last item placed on the Office Clipboard, range A9:A13, to the destination area, A19:A23. If necessary, scroll down to see the complete destination area (Figure 3–13).

Q&A

What if there was data in the destination area before I clicked the Paste button?

Any data contained in the destination area prior to the copy and paste is lost. When you complete a copy, the values and formats in the destination area are replaced with the values and formats of the source area. If you accidentally delete valuable data, click the Undo button on the Quick Access Toolbar or press CTRL+Z.

3

- Press the ESC key to remove the marquee from the source area and disable the Paste button (Home tab | Clipboard group).

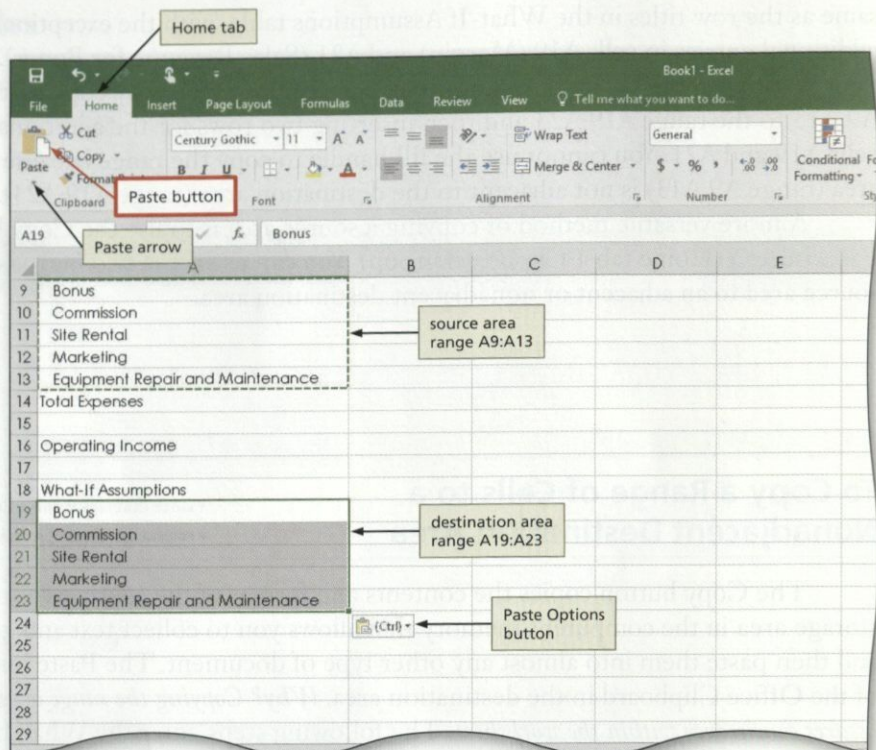


Figure 3–13

Other Ways

- Right-click source area, click Copy on shortcut menu, right-click destination area, click Paste icon on shortcut menu
- Select source area and point to border of range; while holding down CTRL key, drag source area to destination area
- Select source area, press CTRL+C, select destination area, press CTRL+V

BTW

Copying and Pasting from Other Programs

If you need data in Excel that is stored in another program, copying and pasting likely will help you. You might need to experiment before you are successful, because Excel might attempt to copy formatting or other information that you did not intend to paste from the other program. Trying various Paste Option buttons will solve most of such problems.

BTW

Move It or Copy It

Contrary to popular belief, move and copy operations are not the same. When you move a cell, the data in the original location is cleared and the format of the cell is reset to the default. When you copy a cell, the data and format of the copy area remains intact. In short, you should copy cells to duplicate entries and move cells to rearrange entries.

Using the Paste Options Menu

After you click the Paste button, Excel displays the Paste Options button, as shown in Figure 3–13. If you click the Paste Options arrow and select an option in the Paste Options gallery, Excel modifies the most recent paste operation based on your selection. Table 3–4 summarizes the options available in the Paste Options gallery. When the Paste Options button is visible, you can use keyboard shortcuts to access the paste commands available in the Paste Options gallery. Additionally, you can use combinations of the options in the Paste Options gallery to customize your paste operation. That is, after clicking one of the icons in the Paste Options gallery, you can display the gallery again to further adjust your paste operation. The Paste button (Home tab | Clipboard group) includes an arrow that, when clicked, displays the same options as the Paste Options button.

An alternative to clicking the Paste button is to press the ENTER key. The ENTER key completes the paste operation, removes the marquee from the source area, and disables the Paste button so that you cannot paste the copied source area to other destination areas. The ENTER key was not used in the previous set of steps so that the capabilities of the Paste Options button could be discussed. The Paste Options button does not appear on the screen when you use the ENTER key to complete the paste operation.

Using Drag and Drop to Move or Copy Cells

You also can use the mouse to move or copy cells. First, you select the source area and point to the border of the cell or range. You know you are pointing to the

Table 3-4 Paste Gallery Commands

Paste Option Icon	Paste Option	Description
	Paste	Copy contents and format of source area. This option is the default.
	Formulas	Copy formulas from the source area, but not the contents and format.
	Formulas & Number Formatting	Copy formulas and format for numbers and formulas of source area, but not the contents.
	Keep Source Formatting	Copy contents, format, and styles of source area.
	No Borders	Copy contents and format of source area, but not any borders.
	Keep Source Column Widths	Copy contents and format of source area. Change destination column widths to source column widths.
	Transpose	Copy the contents and format of the source area, but transpose, or swap, the rows and columns.
	Values	Copy contents of source area but not the formatting for formulas.
	Values & Number Formatting	Copy contents and format of source area for numbers or formulas, but use format of destination area for text.
	Values & Source Formatting	Copy contents and formatting of source area but not the formula.
	Formatting	Copy format of source area but not the contents.
	Paste Link	Copy contents and format and link cells so that a change to the cells in source area updates the corresponding cells in destination area.
	Picture	Copy an image of the source area as a picture.
	Linked Picture	Copy an image of the source area as a picture so that a change to the cells in source area updates the picture in destination area.

border of the cell or range when the pointer changes to a four-headed arrow. To move the selected cell or cells, drag the selection to the destination area. To copy a selection, hold down the **CTRL** key while dragging the selection to the destination area. You know Excel is in Copy mode when a small plus sign appears next to the pointer. Be sure to release the mouse button before you release the **CTRL** key. Using the mouse to move or copy cells is called **drag and drop**.

Using Cut and Paste to Move Cells

Another way to move cells is to select them, click the Cut button (Home tab | Clipboard group) (Figure 3-12) to remove the cells from the worksheet and copy them to the Office Clipboard, select the destination area, and then click the Paste button (Home tab | Clipboard group) or press the **ENTER** key. You also can use the Cut command on the shortcut menu, instead of the Cut button on the ribbon.

Inserting and Deleting Cells in a Worksheet

At any time while the worksheet is on the screen, you can insert cells to enter new data or delete cells to remove unwanted data. You can insert or delete individual cells; a range of cells, rows, or columns; or entire worksheets.

BTW

Cutting

When you cut a cell or range of cells using the Cut command on a shortcut menu or Cut button (Home tab | Clipboard group), Excel copies the cells to the Office Clipboard; it does not remove the cells from the source area until you paste the cells in the destination area by either clicking the Paste button (Home tab | Clipboard group) or pressing the **ENTER** key. When you complete the paste, Excel clears the cell's or range of cell's entries and their formats from the source area.

To Insert a Row

Why? According to the sketch of the worksheet in Figure 3–3a, two rows must be inserted in the What-If Assumptions table, one above Bonus for the Margin assumption and another between Bonus and Commission for the Sales Revenue for Bonus assumption. The following steps insert the new rows into the worksheet.

- 1 Right-click row heading 20, the row below where you want to insert a row, to display the shortcut menu and the mini toolbar (Figure 3–14).

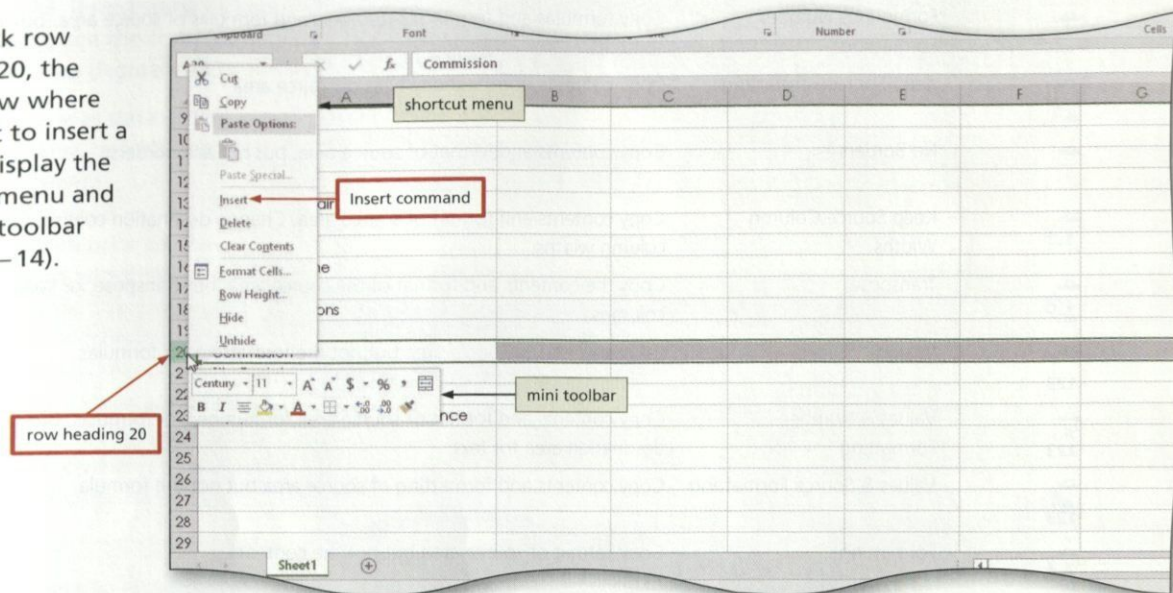


Figure 3–14

- 2 Click Insert on the shortcut menu to insert a new row in the worksheet by shifting the selected row and all rows below it down one row.
- Select cell A20 in the new row and then type **Sales Revenue for Bonus** to enter a new row title (Figure 3–15).

Q&A

What is the resulting format of the new row?

The cells in the new row inherit the formats of the cells in the row above them. You can change this behavior by clicking the Insert Options button that appears below the inserted row. Following the insertion of a row, the Insert Options button allows you to select from the following options: (1) 'Format Same As Above', (2) 'Format Same As Below', and (3) Clear Formatting. The 'Format Same as Above' option is the default. The Insert Options button remains active until you begin the next Excel operation. Excel does not display the Insert Options button if the initial row does not contain any formatted data.

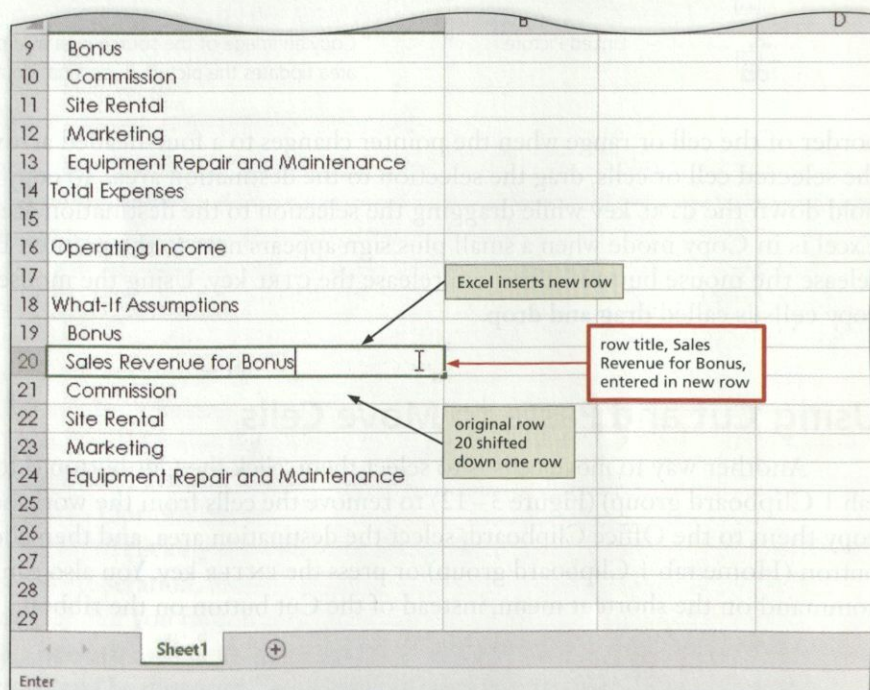
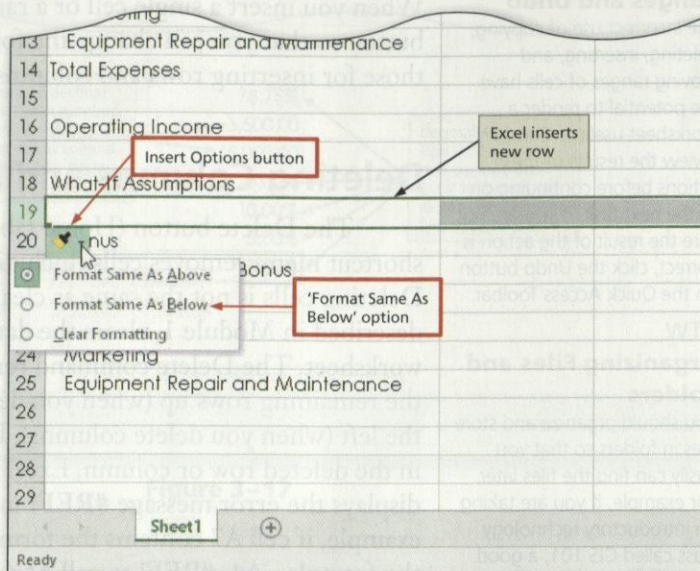


Figure 3–15

3

- Right-click row heading 19, the row below where you want to insert a row, to display the shortcut menu and the mini toolbar.
- Click Insert on the shortcut menu to insert a new row in the worksheet.
- Click the Insert Options button below row 19 (Figure 3-16).
- Click 'Format Same As Below' on the menu.
- Select cell A19 in the new row and then type **Margin** to enter a new row title.

**Figure 3-16****Q&A**

What would happen if cells in the shifted rows were included in formulas? If the rows that shift down included cell references in formulas located in the worksheet, Excel would automatically adjust the cell references in the formulas to their new locations. Thus, in Step 2, if a formula in the worksheet referenced a cell in row 19 before the insert, then Excel would adjust the cell reference in the formula to row 20 after the insert.

4

- Save the workbook on your hard drive, OneDrive, or other storage location using **Kaitlyn's Ice Cream Shoppe Financial Projection** as the file name.

Other Ways

1. Click Insert Cells arrow (Home tab | Cells group), click 'Insert Sheet Rows'
2. Press CTRL+SHIFT+PLUS SIGN, click Entire row (Insert dialog box), click OK button

Inserting Columns

You insert columns into a worksheet in the same way you insert rows. To insert columns, select one or more columns immediately to the right of where you want Excel to insert the new column or columns. Select the number of columns you want to insert, click the Insert arrow (Home tab | Cells group), and then click 'Insert Sheet Columns' in the Insert list; or right-click the selected column(s) and then click Insert on the shortcut menu. The Insert command on the shortcut menu requires that you select an entire column (or columns) to insert a column (or columns). Following the insertion of a column, Excel displays the Insert Options button, which allows you to modify the insertion in a fashion similar to that discussed earlier when inserting rows.

Inserting Single Cells or a Range of Cells

You can use the Insert command on the shortcut menu or the Insert Cells command on the Insert menu — produced by clicking the Insert button (Home tab | Cells group) — to insert a single cell or a range of cells. You should be aware that if you shift a single cell or a range of cells, however, it no longer lines up with its associated cells. To ensure that the values in the worksheet do not get out of order,

BTW

Inserting Multiple Rows

If you want to insert multiple rows, you have two choices. You can insert a single row by using the Insert command on the shortcut menu and then repeatedly press the F4 key to continue inserting rows. Alternatively, you can select a number of existing rows equal to the number of rows that you want to insert. For instance, if you want to insert five rows, select five existing rows in the worksheet, right-click the selected rows, and then click Insert on the shortcut menu.

BTW

Dragging Ranges

You can move and insert a selected cell or range between existing cells by holding down the SHIFT key while you drag the selection to the gridline where you want to insert the selected cell or range. You also can copy and insert by holding down the CTRL+SHIFT keys while you drag the selection to the desired gridline.

BTW

Ranges and Undo

The incorrect use of copying, deleting, inserting, and moving ranges of cells have the potential to render a worksheet useless. Carefully review the results of these actions before continuing on to the next task. If you are not sure the result of the action is correct, click the Undo button on the Quick Access Toolbar.

BTW

Organizing Files and Folders

You should organize and store files in folders so that you easily can find the files later. For example, if you are taking an introductory technology class called CIS 101, a good practice would be to save all Excel files in an Excel folder in a CIS 101 folder. For a discussion of folders and detailed examples of creating folders, refer to the Office and Windows module at the beginning of this book.

spreadsheet experts recommend that you insert only entire rows or entire columns. When you insert a single cell or a range of cells, Excel displays the Insert Options button so that you can change the format of the inserted cell, using options similar to those for inserting rows and columns.

Deleting Columns and Rows

The Delete button (Home tab | Cells group) or the Delete command on the shortcut menu removes cells (including the data and format) from the worksheet. Deleting cells is not the same as clearing cells. The Clear Contents command, described in Module 1, clears the data from the cells, but the cells remain in the worksheet. The Delete command removes the cells from the worksheet and shifts the remaining rows up (when you delete rows) or shifts the remaining columns to the left (when you delete columns). If formulas located in other cells reference cells in the deleted row or column, Excel does not adjust these cell references. Excel displays the error message **#REF!** in those cells to indicate a cell reference error. For example, if cell A7 contains the formula `=A4+A5` and you delete row 5, Excel assigns the formula `=A4+#REF!` to cell A6 (originally cell A7) and displays the error message, **#REF!**, in cell A6. Excel also displays an Error Options button when you select the cell containing the error message, **#REF!**, which allows you to select options to determine the nature of the problem.

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS

4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

To Enter Numbers with Format Symbols

The next step in creating the Financial Projection worksheet is to enter the what-if assumptions values in the range B19:B25. The numbers in the table can be entered and then formatted using techniques from Modules 1 and 2, or each number can be entered with **format symbols**, which assign a format to numbers as they are entered. When a number is entered with a format symbol, Excel displays it with the assigned format. Valid format symbols include the dollar sign (\$), comma (,), and percent sign (%).

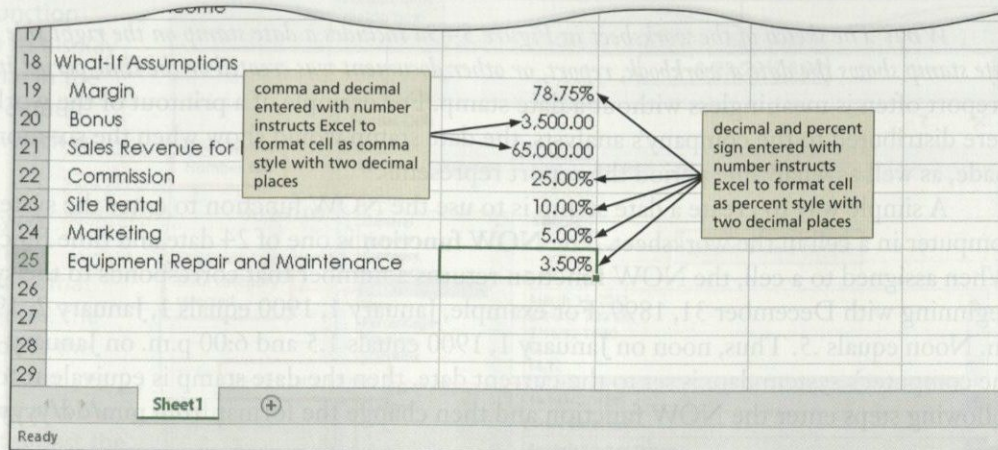
If you enter a whole number, it appears without any decimal places. If you enter a number with one or more decimal places and a format symbol, Excel displays the number with two decimal places. Table 3–5 illustrates several examples of numbers entered with format symbols. The number in parentheses in column 4 indicates the number of decimal places.

Table 3–5 Numbers Entered with Format Symbols

Format Symbol	Typed in Formula Bar	Displays in Cell	Comparable Format
,	374,149	374,149	Comma(0)
	5,833.6	5,833.60	Comma(2)
\$	\$58917	\$58,917	Currency(0)
	\$842.51	\$842.51	Currency(2)
	\$63,574.9	\$63,574.90	Currency(2)
%	85%	85%	Percent(0)
	12.80%	12.80%	Percent(2)
	68.2242%	68.2242%	Percent(4)

Why? In some cases, using a format symbol is the most efficient method for entering and formatting data. The following step enters the numbers in the What-If Assumptions table with format symbols.

- 1** Enter the following values, using format symbols to apply number formatting: 78.75% in cell B19, 3,500.00 in cell B20, 65,000.00 in cell B21, 25.00% in cell B22, 10.00% in cell B23, 5.00% in cell B24, and 3.50% in cell B25 (Figure 3-17).

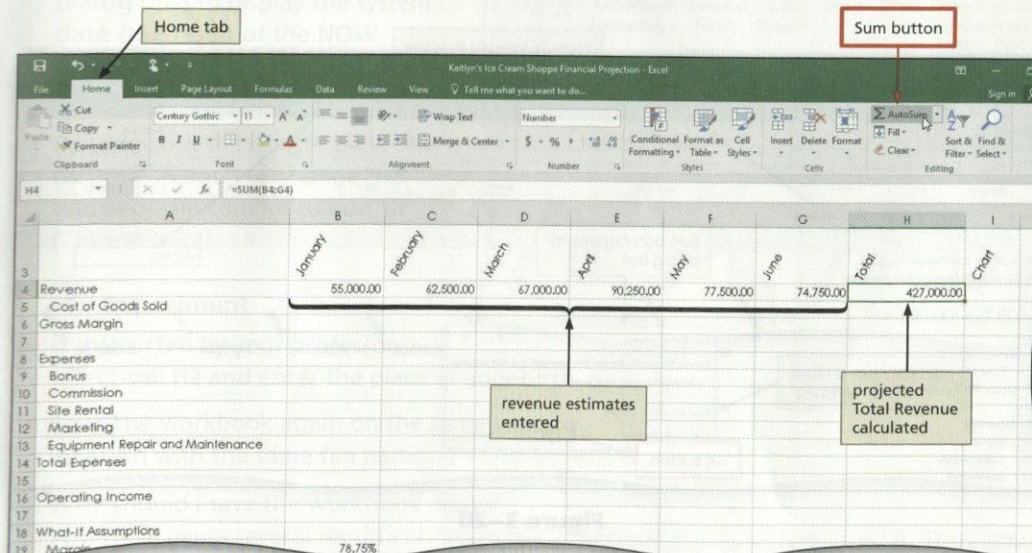
**Figure 3-17****Other Ways**

1. Right-click range, click Format Cells on shortcut menu, click Number tab (Format Cells dialog box), click category in Category list, select desired format, click OK button
2. Press CTRL+1, click Number tab (Format Cells dialog box), click category in Category list, select desired format, click OK button

To Enter the Projected Monthly Sales

The following steps enter the projected revenue, listed previously in Table 3-1, in row 4 and compute the projected six-month revenue in cell H4.

- 1** If necessary, display the Home tab.
- 2** Enter 55,000.00 in cell B4, 62,500.00 in cell C4, 67,000.00 in cell D4, 90,250.00 in cell E4, 77,500.00 in cell F4, and 74,750.00 in cell G4.
- 3** Select cell H4 and then click the Sum button (Home tab | Editing group) twice to create a sum in the selected cell (Figure 3-18).

**Figure 3-18**

To Enter and Format the System Date

Why? The sketch of the worksheet in Figure 3–3a includes a date stamp on the right side of the heading section. A date stamp shows the date a workbook, report, or other document was created or the time period it represents. In business, a report often is meaningless without a date stamp. For example, if a printout of the worksheet in this module were distributed to the company's analysts, the date stamp would show when the six-month projections were made, as well as what time period the report represents.

A simple way to create a date stamp is to use the NOW function to enter the system date tracked by your computer in a cell in the worksheet. The **NOW function** is one of 24 date and time functions available in Excel. When assigned to a cell, the NOW function returns a number that corresponds to the system date and time beginning with December 31, 1899. For example, January 1, 1900 equals 1, January 2, 1900 equals 2, and so on. Noon equals .5. Thus, noon on January 1, 1900 equals 1.5 and 6:00 p.m. on January 1, 1900 equals 1.75. If the computer's system date is set to the current date, then the date stamp is equivalent to the current date. The following steps enter the NOW function and then change the format from mm/dd/yyyy hh:mm to mm/dd/yyyy.

1

- Select cell H1 and then click the Insert Function button in the formula bar to display the Insert Function dialog box.

- Click the 'Or select a category' arrow (Insert Function dialog box) and then select 'Date & Time' to populate the 'Select a function' list with data and time functions.

- Scroll down in the 'Select a function' list and then click NOW to select the required function (Figure 3–19).

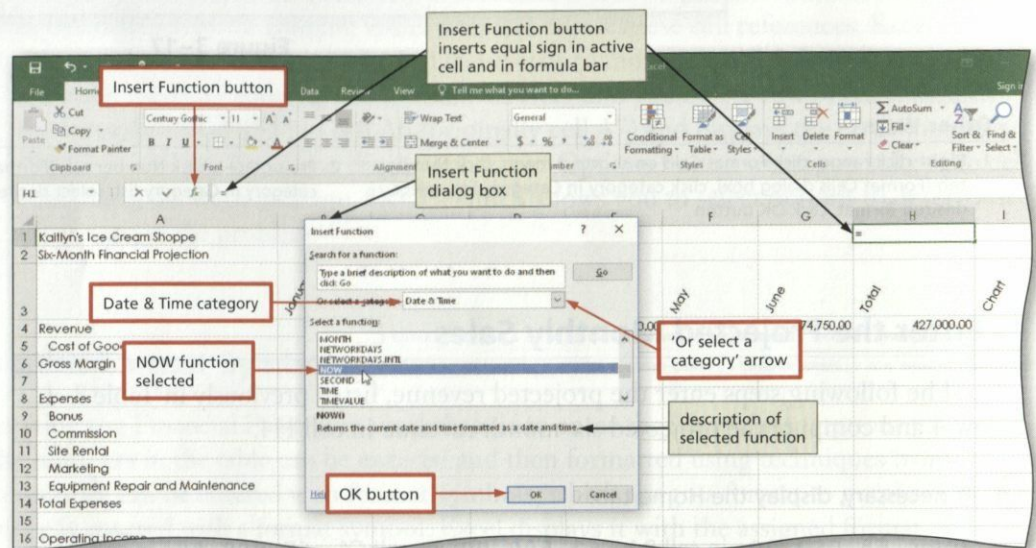


Figure 3–19

2

- Click the OK button (Insert Function dialog box) to close the Insert Function dialog box and display the Function Arguments dialog box (Figure 3–20).

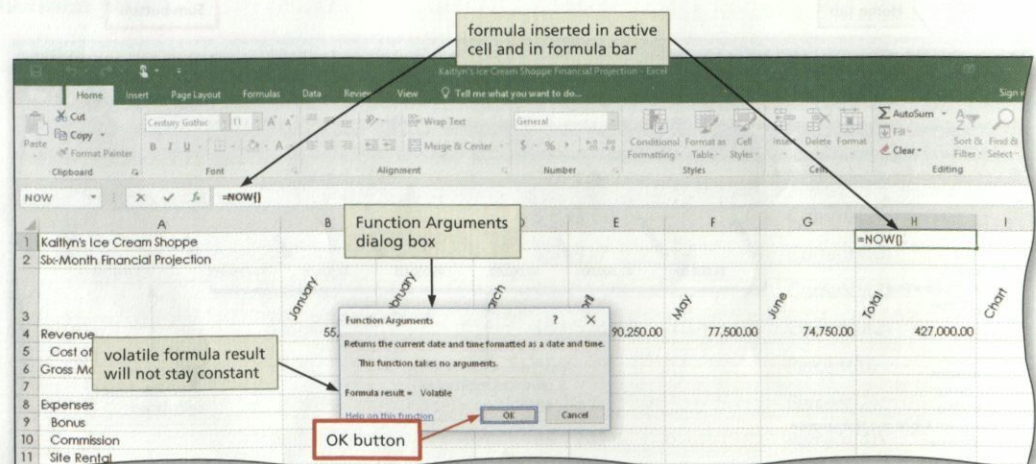


Figure 3–20

Q&A

What is meant by 'Formula result = Volatile' in the Function Arguments dialog box?

The NOW function is an example of a

volatile function. A **volatile function** is one where the number that the function returns is not constant but changes each time the worksheet is opened. As a result, any formula using the NOW function will have a variable result.

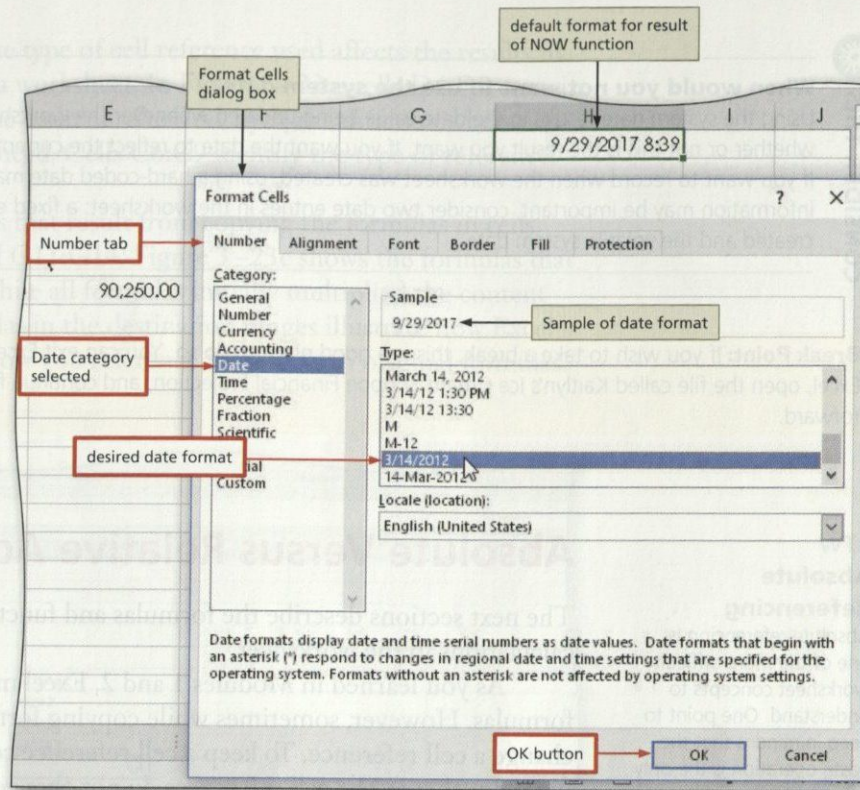
3

- Click the OK button (Function Arguments dialog box) to display the system date and time in the selected cell, using the default date and time format, which is mm/dd/yyyy hh:mm.

Q&A What does the mm/dd/yyyy hh:mm format represent?

The mm/dd/yyyy hh:mm format can be explained as follows: the first mm is the month, dd is the day of the month, yyyy is the year, hh is the hour of the day, and the second mm is the minutes past the hour. Excel applies this date and time format to the result of the NOW function.

- Right-click cell H1 to display a shortcut menu and mini toolbar.
- Click Format Cells on the shortcut menu to display the Format Cells dialog box.
- If necessary, click the Number tab (Format Cells dialog box) to display the Number sheet.
- Click Date in the Category list (Format Cells dialog box) to display the date format options in the Type list. Scroll down in the Type list and then click 3/14/2012 to display a sample of the data in the Sample area in the dialog box (Figure 3-21).

**Figure 3-21**

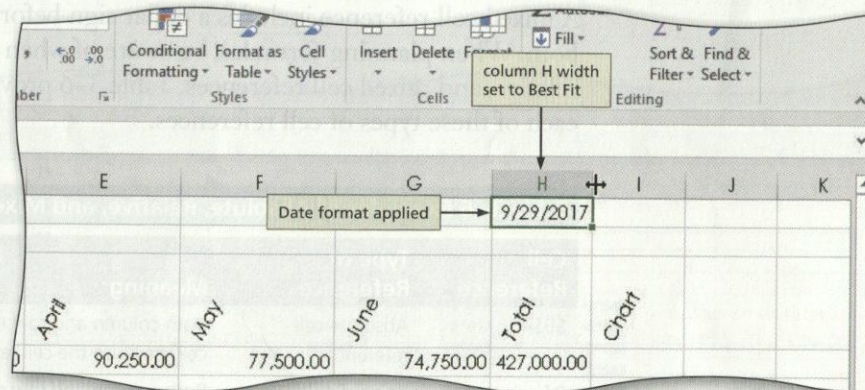
Q&A Why do the dates in the Type box show March 14, 2012 instead of the current date?
March 14, 2012 is just used as a sample date in this version of Office.

4

- Click the OK button (Format Cells dialog box) to display the system date (the result of the NOW function) in the format mm/dd/yyyy.
- Double-click the border between columns H and I to change the width of the column to best fit (Figure 3-22).

**Experiment**

- If instructed by your professor, select cell H2 and enter the place of your birth.
- Save the workbook again on the same storage location with the same file name.

**Figure 3-22**

Q&A Why should I save the workbook again?
You have made several modifications to the workbook since you last saved it. Thus, you should save it again.

Other Ways

- Click 'Date & Time' button (Formulas tab | Function Library group), click NOW
- Press CTRL+SEMICOLON (this enters the date as a static value, meaning the date will not change when the workbook is opened at a later date)
- Press CTRL+SHIFT+# to format date as day-month-year



CONSIDER THIS

When would you not want to use the system date?

Using the system date results in the date value being updated whenever the worksheet is opened. Think carefully about whether or not this is the result you want. If you want the date to reflect the current date, using the system date is appropriate. If you want to record when the worksheet was created, using a hard-coded date makes more sense. If both pieces of information may be important, consider two date entries in the worksheet: a fixed entry identifying the date the worksheet was created and the volatile system date.

Break Point: If you wish to take a break, this is a good place to do so. You can exit Excel now. To resume at a later time, run Excel, open the file called Kaitlyn's Ice Cream Shoppe Financial Projection, and continue following the steps from this location forward.

BTW

Absolute Referencing

Absolute referencing is one of the more difficult worksheet concepts to understand. One point to keep in mind is that the paste operation is the only operation affected by an absolute cell reference. An absolute cell reference instructs the paste operation to use the same cell reference as it copies a formula from one cell to another.

Absolute Versus Relative Addressing

The next sections describe the formulas and functions needed to complete the calculations in the worksheet.

As you learned in Modules 1 and 2, Excel modifies cell references when copying formulas. However, sometimes while copying formulas you do not want Excel to change a cell reference. To keep a cell reference constant when copying a formula or function (that is, the cell references do not change relative to where you are copying the formula), Excel uses a technique called **absolute cell referencing**. To specify an absolute cell reference in a formula, enter a dollar sign (\$) before any column letters or row numbers you want to keep constant in formulas you plan to copy. For example, \$B\$4 is an absolute cell reference, whereas B4 is a relative cell reference. Both reference the same cell. The difference becomes apparent when they are copied to a destination area. A formula using the absolute cell reference \$B\$4 instructs Excel to keep the cell reference B4 constant (absolute) in the formula as it is copied to the destination area. A formula using the **relative cell reference** B4 instructs Excel to adjust the cell reference as it is copied to the destination area. A cell reference where one factor remains constant and the other one varies is called a **mixed cell reference**. A mixed cell reference includes a dollar sign before the column or the row, not before both. When planning formulas, be aware of when you might need to use absolute, relative, and mixed cell references. Table 3–6 provides some additional examples of each of these types of cell references.

Table 3–6 Examples of Absolute, Relative, and Mixed Cell References

Cell Reference	Type of Reference	Meaning
\$B\$4	Absolute cell reference	Both column and row references remain the same when you copy this cell, because the cell references are absolute.
B4	Relative cell reference	Both column and row references are relative. When copied to another cell, both the column and row in the cell reference are adjusted to reflect the new location.
B\$4	Mixed reference	This cell reference is mixed. The column reference changes when you copy this cell to another column because it is relative. The row reference does not change because it is absolute.
\$B4	Mixed reference	This cell reference is mixed. The column reference does not change because it is absolute. The row reference changes when you copy this cell reference to another row because it is relative.

Figure 3–23 illustrates how the type of cell reference used affects the results of copying a formula to a new place in a worksheet. In Figure 3–23a, cells D6:D9 contain formulas. Each formula multiplies the content of cell A2 by 2; the difference between formulas lies in how cell A2 is referenced. Cells C6:C9 identify the type of reference: absolute, relative, or mixed.

Figure 3–23b shows the values that result from copying the formulas in cells D6:D9 to ranges E6:E9, F7:F10, and G11:G14. Figure 3–23c shows the formulas that result from copying the formulas. While all formulas initially multiplied the content of cell A2 by 2, the values and formulas in the destination ranges illustrate how Excel adjusts cell references according to how you reference those cells in original formulas.

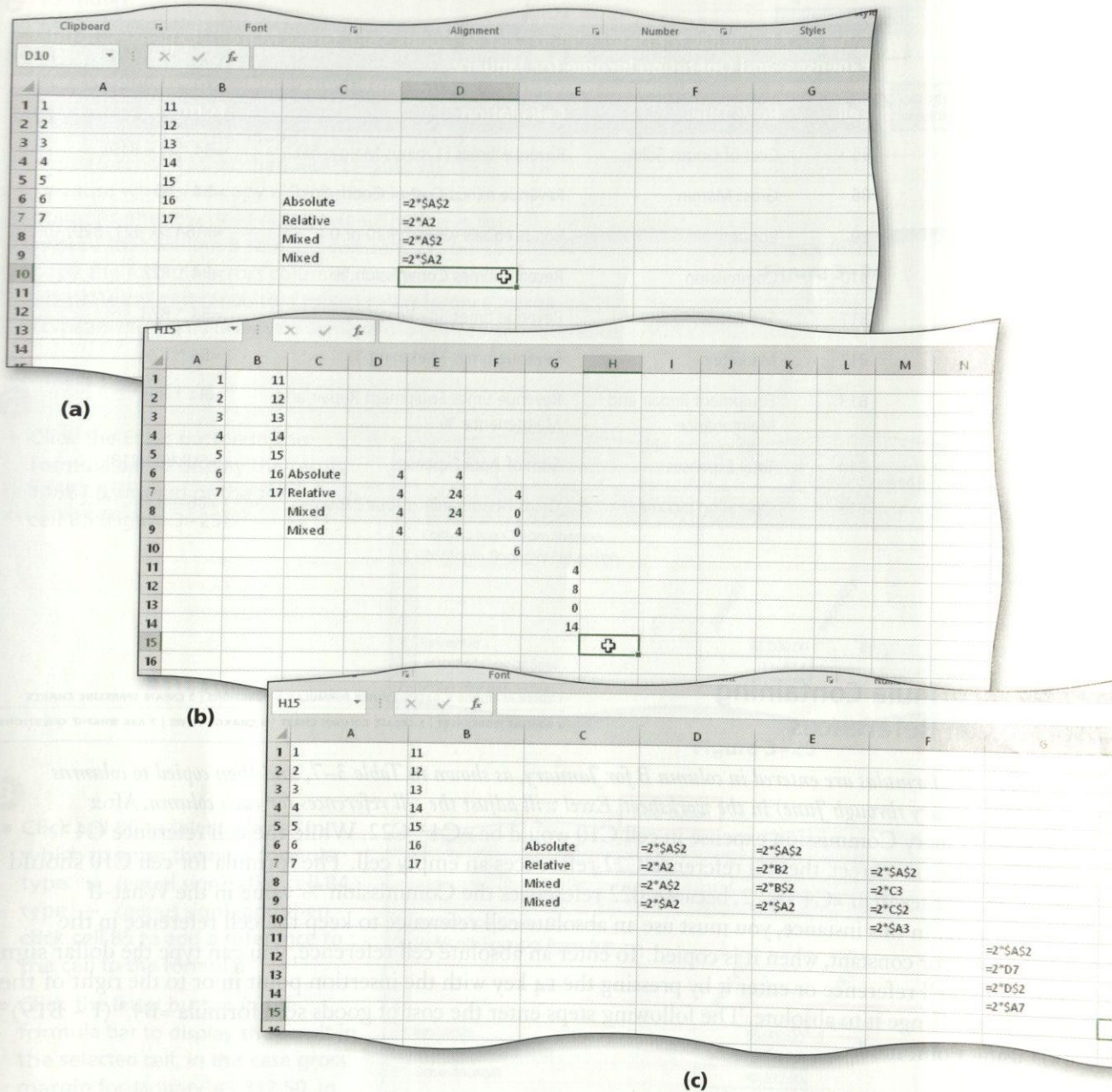


Figure 3–23

In the worksheet, you need to enter formulas that calculate the following values for January: cost of goods sold (cell B5), gross margin (cell B6), expenses (range B9:B13), total expenses (cell B14), and operating income (cell B16). The formulas are based on the projected monthly revenue in cell B4 and the assumptions in the range B19:B25.

The calculations for each column (month) are the same, except for the reference to the projected monthly revenue in row 4, which varies according to the month (B4 for January, C4 for February, and so on). Thus, the formulas for January can be entered in column B and then copied to columns C through G. Table 3–7 shows the formulas for determining the January cost of goods sold, gross margin, expenses, total expenses, and operating income in column B.

Table 3–7 Formulas for Determining Cost of Goods Sold, Gross Margin, Expenses, Total Expenses, and Operating Income for January

Cell	Row Title	Calculation	Formula
B5	Cost of Goods Sold	Revenue times (1 minus Margin %)	=B4 * (1 - B19)
B6	Gross Margin	Revenue minus Cost of Goods Sold	=B4 - B5
B9	Bonus	Bonus equals value in B20 or 0	=IF(B4 >= B21, B20, 0)
B10	Commission	Revenue times Commission %	=B4 * B22
B11	Site Rental	Revenue times Site Rental %	=B4 * B23
B12	Marketing	Revenue times Marketing %	=B4 * B24
B13	Equipment Repair and Maintenance	Revenue times Equipment Repair and Maintenance %	=B4 * B25
B14	Total Expenses	Sum of April Expenses	=SUM(B9:B13)
B16	Operating Income	Gross Margin minus Total Expenses	=B6 - B14

To Enter a Formula Containing Absolute Cell References

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS

4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? As the formulas are entered in column B for January, as shown in Table 3–7, and then copied to columns C through G (February through June) in the worksheet, Excel will adjust the cell references for each column. After the copy, the February Commission expense in cell C10 would be =C4 * C22. While the cell reference C4 (February Revenue) is correct, the cell reference C22 references an empty cell. The formula for cell C10 should read =C4 * B22, rather than =C4 * C22, because B22 references the Commission % value in the What-If Assumptions table. In this instance, you must use an absolute cell reference to keep the cell reference in the formula the same, or constant, when it is copied. To enter an absolute cell reference, you can type the dollar sign (\$) as part of the cell reference or enter it by pressing the F4 key with the insertion point in or to the right of the cell reference to change it to absolute. The following steps enter the cost of goods sold formula =B4 * (1 - B19) in cell B5 using Point mode.

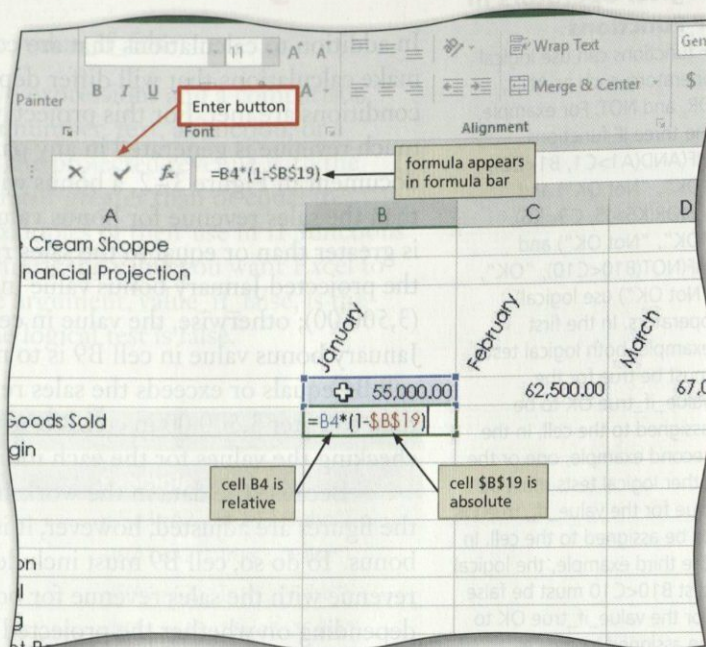
1

- Click cell B5 to select the cell in which to enter the first formula.
- Type **=** (equal sign), select cell B4, type ***** (1–B19 to continue entering the formula, and then press the F4 key to change the cell reference from a relative cell reference to an absolute cell reference. Type **)** (closing parenthesis) to complete the formula (Figure 3–24).

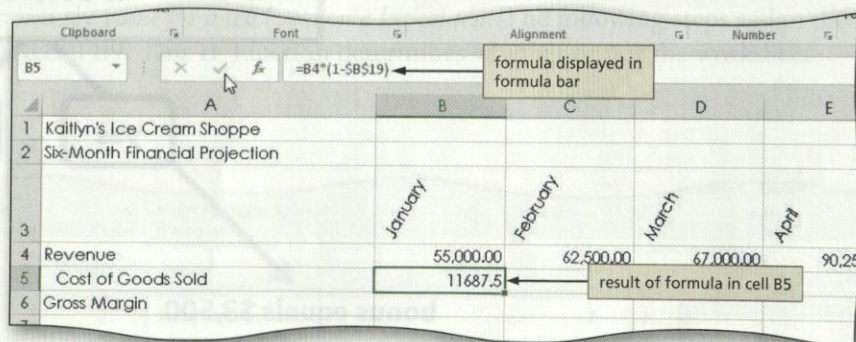
Q&A

Is an absolute reference required in this formula?

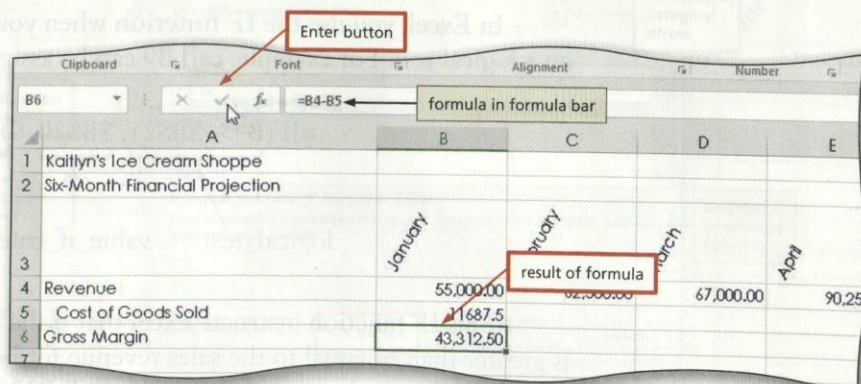
No, a mixed cell reference also could have been used. The formula in cell B5 will be copied across columns, rather than down rows. So, the formula entered in cell B5 in Step 1 could have been entered as $=B4*(1-\$B\$19)$ using a mixed cell reference, rather than $=B4*(1-\$B\$19)$, because when you copy a formula across columns, the row does not change. The key is to ensure that column B remains constant as you copy the formula across columns. To change the absolute cell reference to a mixed cell reference, continue to press the F4 key until you achieve the desired cell reference.

**Figure 3–24****2**

- Click the Enter button in the formula bar to display the result, 11687.5, instead of the formula in cell B5 (Figure 3–25).

**Figure 3–25****3**

- Click cell B6 to select the cell in which to enter the next formula, type **=** (equal sign), click cell B4, type **-** (minus sign), and then click cell B5 to add a reference to the cell to the formula.
- Click the Enter button in the formula bar to display the result in the selected cell, in this case gross margin for January, 43,312.50, in cell B6 (Figure 3–26).

**Figure 3–26**

BTW

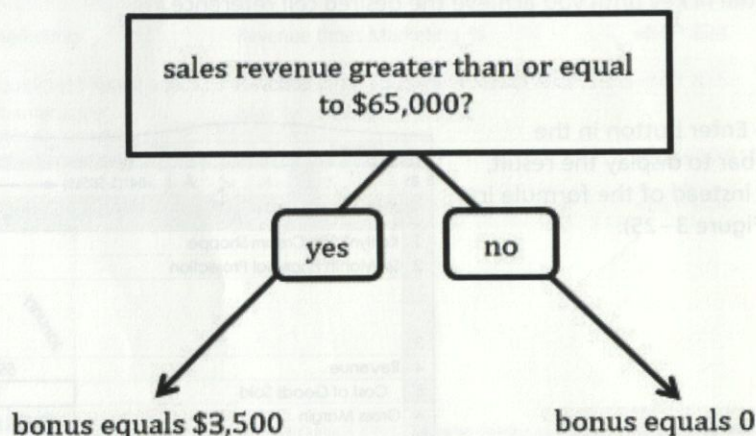
Logical Operators in IF Functions

IF functions can use logical operators, such as AND, OR, and NOT. For example, the three IF functions =IF(AND(A1>C1, B1<C2), "OK", "Not OK") and =IF(OR(K5>J5, C3<K6), "OK", "Not OK") and =IF(NOT(B10<C10), "OK", "Not OK") use logical operators. In the first example, both logical tests must be true for the value_if_true OK to be assigned to the cell. In the second example, one or the other logical tests must be true for the value_if_true OK to be assigned to the cell. In the third example, the logical test B10<C10 must be false for the value_if_true OK to be assigned to the cell.

Making Decisions — The IF Function

In addition to calculations that are constant across all categories, you may need to make calculations that will differ depending on whether a particular condition or set of conditions are met. For this project, you need to vary compensation according to how much revenue is generated in any particular month. According to the requirements document in Figure 3-2, a bonus will be paid in any month where revenue is greater than the sales revenue for bonus value. If the projected January revenue in cell B4 is greater than or equal to the sales revenue for bonus in cell B21 (65,000.00), then the projected January bonus value in cell B9 is equal to the bonus value in cell B20 (3,500.00); otherwise, the value in cell B9 is equal to 0. One way to assign the projected January bonus value in cell B9 is to manually check to see if the projected revenue in cell B4 equals or exceeds the sales revenue for the bonus amount in cell B21 and, if so, then to enter 3,500.00 in cell B9. You can use this manual process for all six months by checking the values for the each month.

Because the data in the worksheet changes each time a report is prepared or the figures are adjusted, however, it is preferable to have Excel calculate the monthly bonus. To do so, cell B9 must include a formula or function that compares the projected revenue with the sales revenue for bonus value, and displays 3,500.00 or 0.00 (zero), depending on whether the projected January revenue in cell B4 is greater than, equal to, or less than the sales revenue for bonus value in cell B21. This decision-making process is a **logical test**. It can be represented in diagram form, as shown in Figure 3-27.

**Figure 3-27**

In Excel, you use the **IF function** when you want to assign a value to a cell based on a logical test. For example, cell B9 can be assigned the following IF function:

=IF(B4>=\$B\$21, \$B\$20, 0)

logical_test value_if_true value_if_false

This IF function instructs Excel that if the projected January revenue in cell B4 is greater than or equal to the sales revenue for bonus value in cell B21, then Excel should display the bonus value found in cell B20 in cell B9. If the projected January revenue in cell B4 is not greater than or equal to the sales revenue for bonus value in cell B21, then Excel should display a 0 (zero) in cell B9.

The general form of the IF function is:

`=IF(logical_test, value_if_true, value_if_false)`

The argument, `logical_test`, is made up of two expressions and a comparison operator. Each expression can be a cell reference, a number, text, a function, or a formula. In this example, the logical test compares the projected revenue with the sales revenue for bonus, using the comparison operator greater than or equal to. Valid comparison operators, their meanings, and examples of their use in IF functions are shown in Table 3–8. The argument, `value_if_true`, is the value you want Excel to display in the cell when the logical test is true. The argument, `value_if_false`, is the value you want Excel to display in the cell when the logical test is false.

Table 3–8 Comparison Operators

Comparison Operator	Meaning	Example
=	Equal to	=IF(A1=A2, "True", "False")
<	Less than	=IF(A1<A2, "True", "False")
>	Greater than	=IF(A1>A2, "True", "False")
>=	Greater than or equal to	=IF(A1>=A2, "True", "False")
<=	Less than or equal to	=IF(A1<=A2, "True", "False")
<>	Not equal to	=IF(A1<>A2, "True", "False")

To Enter an IF Function

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS

4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? Use an IF function to determine the value for a cell based on a logical test. The following steps assign the IF function `=IF(B4>=$B$21,$B$20,0)` to cell B9. This IF function determines whether or not the worksheet assigns a bonus for January.

1

- Click cell B9 to select the cell for the next formula.
- Click the Insert Function button in the formula bar to display the Insert Function dialog box.
- Click the 'Or select a category' arrow (Insert Function dialog box) and then select Logical in the list to populate the 'Select a function' list with logic functions.
- Click IF in the 'Select a function' list to select the required function (Figure 3–28).

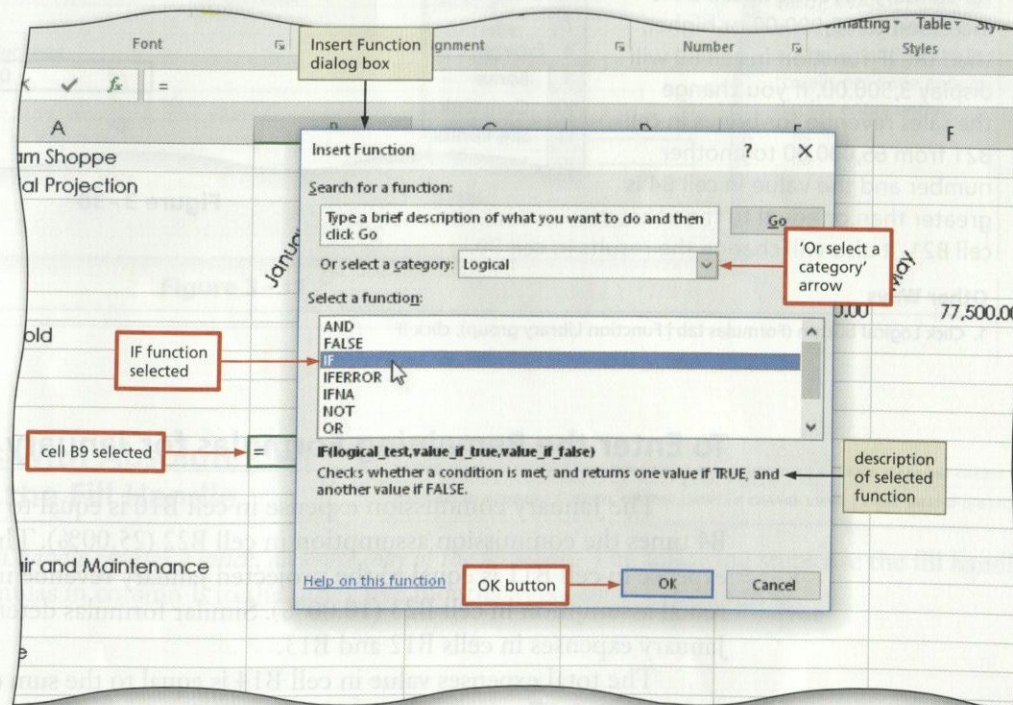


Figure 3–28

2

- Click the OK button (Insert Function dialog box) to display the Function Arguments dialog box.
- Type **b4>=b\$21** in the Logical_test box to enter a logical test for the IF function.
- Type **\$b\$20** in the Value_if_true box to enter the result of the IF function if the logical test is true.
- Type **0** (zero) in the Value_if_false box to enter the result of the IF function if the logical test is false (Figure 3–29).

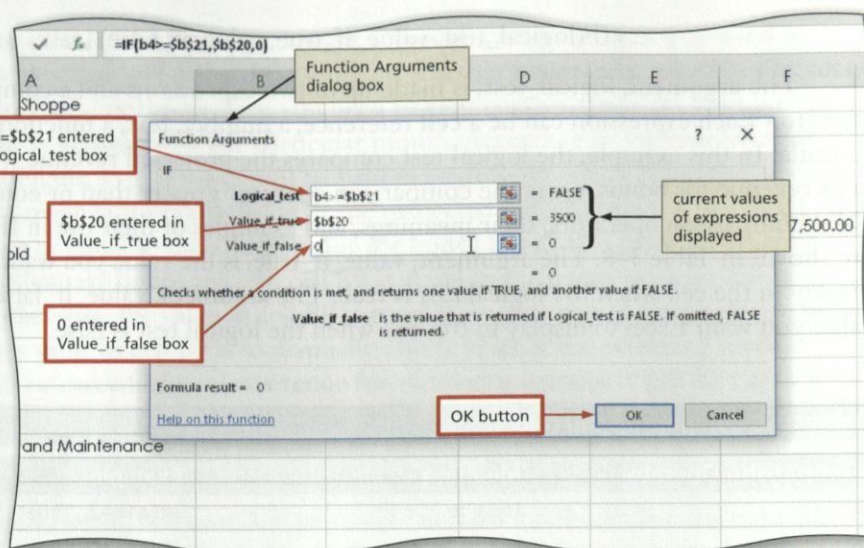


Figure 3–29

3

- Click the OK button (Function Arguments dialog box) to insert the IF function in the selected cell (Figure 3–30).

Q&A

Why does cell B9 contain the value 0 (zero)?

The value that Excel displays in cell B9 depends on the values assigned to cells B4, B20, and B21. For example, if the value for January revenue in cell B4 is increased to 65,000.00 or higher, then the IF function in cell B9 will display 3,500.00. If you change the sales revenue for bonus in cell B21 from 65,000.00 to another number and the value in cell B4 is greater than or equal to the value in cell B21, it also will change the results in cell B9.

	A	B	C	D
1	Kaitlyn's Ice Cream Shoppe			
2	Six-Month Financial Projection			
3		January	February	March
4	Revenue	55,000.00	62,500.00	67,000.00
5	Cost of Goods Sold	11,687.5		
6	Gross Margin	43,312.50		
7				
8	Expenses			
9	Bonus	0		
10	Commission			
11	Site Rental			
12				

Figure 3–30

Other Ways

- Click Logical button (Formulas tab | Function Library group), click IF

To Enter the Remaining Formulas for January

The January commission expense in cell B10 is equal to the revenue in cell B4 times the commission assumption in cell B22 (25.00%). The January site rental expense in cell B11 is equal to the projected January revenue in cell B4 times the site rental assumption in cell B23 (10.00%). Similar formulas determine the remaining January expenses in cells B12 and B13.

The total expenses value in cell B14 is equal to the sum of the expenses in the range B9:B13. The operating income in cell B16 is equal to the gross margin in cell B6

minus the total expenses in cell B14. Because the formulas are short, they are typed in the following steps, rather than entered using Point mode.

- 1 Select cell B10. Type `=b4*$b$22` and then press the DOWN ARROW key to enter the formula in the selected cell. Type `=b4*$b$23` and then press the DOWN ARROW key to enter the formula in cell B11. Type `=b4*$b$24`, press the DOWN ARROW key, type `=b4*$b$25`, and then press the DOWN ARROW key again.
- 2 With cell B14 selected, click the Sum button (Home tab | Editing group) twice to insert a SUM function in the selected cell. Select cell B16 to prepare to enter the next formula. Type `=b6-b14` and then press the ENTER key to enter the formula in the selected cell.
- 3 Press CTRL+ACCENT MARK (') to display the formulas version of the worksheet (Figure 3-31).
- 4 When you are finished viewing the formulas version, press CTRL+ACCENT MARK (') again to return to the values version of the worksheet.

Q&A Why should I view the formulas version of the worksheet?
Viewing the formulas version (Figure 3-31) of the worksheet allows you to check the formulas you entered in the range B5:B16. Recall that formulas were entered in lowercase. You can see that Excel converts all the formulas from lowercase to uppercase.

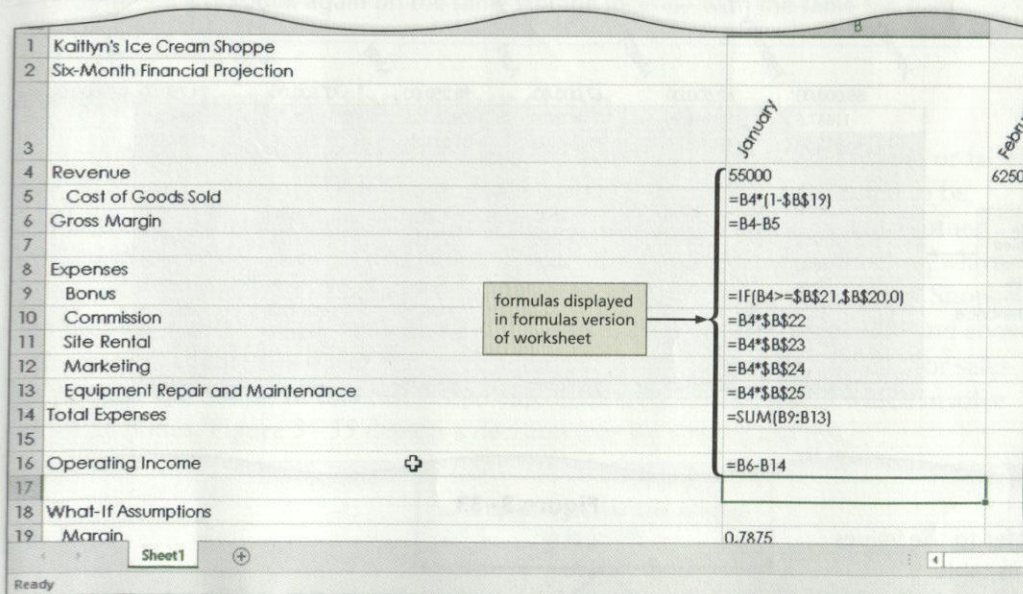


Figure 3-31

BTW

Replacing a Formula with a Constant

Using the following steps, you can replace a formula with its result so that the cell value remains constant: (1) click the cell with the formula; (2) press the F2 key or click in the formula bar; (3) press the F9 key to display the value in the formula bar; and (4) press the ENTER key.

BTW

Error Messages

When Excel cannot calculate a formula, it displays an error message in a cell. These error messages always begin with a number sign (#). The more commonly occurring error messages are as follows: #DIV/0! (tries to divide by zero); #NAME? (uses a name Excel does not recognize); #N/A (refers to a value not available); #NULL! (specifies an invalid intersection of two areas); #NUM! (uses a number incorrectly); #REF! (refers to a cell that is not valid); #VALUE! (uses an incorrect argument or operand); and ##### (refers to cells not wide enough to display entire entry).

To Copy Formulas with Absolute Cell References Using the Fill Handle

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS

4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? Using the fill handle ensures a quick, accurate copy of the formulas. The following steps use the fill handle to copy the January formulas in column B to the other five months in columns C through G.

1

- Select the range B5:B16 and then point to the fill handle in the lower-right corner of the selected cell, B16 in this case, to display the crosshair pointer (Figure 3–32).

	Jan	Feb	Mar	Apr	May	Jun
4 Revenue	55,000.00	62,500.00	67,000.00	90,250.00	77,500.00	
5 Cost of Goods Sold	11,687.5					
6 Gross Margin	43,312.50					
7						
8 Expenses						
9 Bonus	0					
10 Commission	13,750					
11 Site Rental	5,500					
12 Marketing	2,750					
13 Equipment Repair and Maintenance	1,925					
14 Total Expenses	23,925					
15						
16 Operating Income	19,387.50					
17						
18 What-If Assumptions						
19 Margin	78.75%					

Figure 3–32

2

- Drag the fill handle to the right to copy the formulas from the source area, B5:B16 in this case, to the destination area, C5:G16 in this case, and display the calculated amounts (Figure 3–33).

Q&A

What happens to the formulas after performing the copy operation? Because the formulas in the range B5:B16 use absolute cell references, when they are copied to the range C5:G16, they still refer to the values in the What-If Assumptions table.

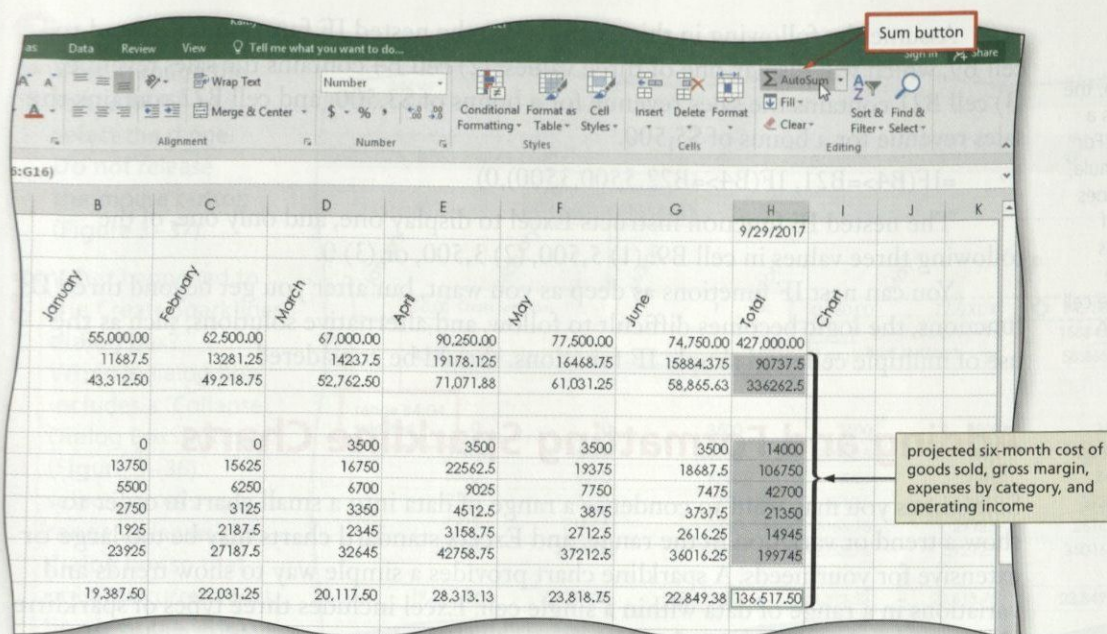
	B	C	D	E	F	G	H
							9/29/2017
	January	February	March	April	May	June	Total
	55,000.00	62,500.00	67,000.00	90,250.00	77,500.00	74,750.00	427,000.00
	11,687.5	13,281.25	14,237.5	19,178.125	16,468.75	15,884.375	
	43,312.50	49,218.75	52,762.50	71,071.88	61,031.25	58,865.63	
	0	0	3,500	3,500	3,500	3,500	
	13,750	15,625	16,750	22,562.5	19,375	18,687.5	
	5,500	6,250	6,700	9,025	7,750	7,475	
	2,750	3,125	3,350	4,512.5	3,875	3,737.5	
	1,925	2,187.5	2,345	3,158.75	2,712.5	2,616.25	
	23,925	27,187.5	32,645	42,758.75	37,212.5	36,016.25	
	19,387.50	22,031.25	20,117.50	28,313.13	23,818.75	22,849.38	
	78.75%						

Figure 3–33

To Determine Row Totals in Nonadjacent Cells

The following steps determine the row totals in column H. To determine the row totals using the Sum button, select only the cells in column H containing numbers in adjacent cells to the left. If, for example, you select the range H5:H16, Excel will display 0s as the sum of empty rows in cells H7, H8, and H15.

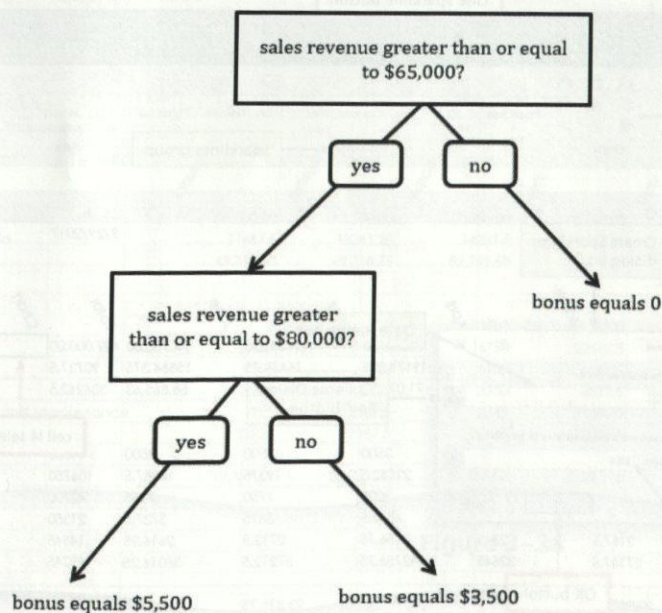
- Select the range H5:H6. While holding down the CTRL key, select the range H9:H14 and cell H16, as shown in Figure 3–34.
- Click the Sum button (Home tab | Editing group) to display the row totals in the selected ranges (Figure 3–34).

**Figure 3-34**

- 3** Save the workbook again on the same storage location with the same file name.

Nested Forms of the IF Function

A **nested IF function** is one in which the action to be taken for the true or false case includes yet another IF function. The second IF function is considered to be nested, or layered, within the first. You can use a nested IF function to add another condition to the decision-making process. Study the nested IF function below, which would add another level of bonus to the compensation at Kaitlyn's Ice Cream Shoppe. In this case, Kaitlyn's Ice Cream Shoppe assigns a bonus for sales of \$65,000 and above. For months where sales make that level, additional bonus money is available for sales of \$80,000 and above. In this case, three outcomes are possible, two of which involve paying a bonus. Figure 3-35 depicts a decision tree for this logical test.

**Figure 3-35**

BTW

Using IFERROR

Similar to the IF function, the IFERROR function checks a formula for correctness. For example, =IFERROR(formula, "Error Message") examines the formula argument. If an error appears (such as #N/A), Excel displays the Error Message text in the cell instead of the Excel #N/A error.

Assume the following in this example: (1) the nested IF function is assigned to cell B9, which will display one of three values; (2) cell B4 contains the sales revenue; (3) cell B21 contains the sales revenue for a bonus of \$3,500; and cell B22 contains the sales revenue for a bonus of \$5,500.

=IF(B4>=B21, IF(B4>=B22,5500,3500),0)

The nested IF function instructs Excel to display one, and only one, of the following three values in cell B9: (1) 5,500, (2) 3,500, or (3) 0.

You can nest IF functions as deep as you want, but after you get beyond three IF functions, the logic becomes difficult to follow, and alternative solutions, such as the use of multiple cells and simple IF functions, should be considered.

Adding and Formatting Sparkline Charts

Sometimes you may want to condense a range of data into a small chart in order to show a trend or variation in the range, and Excel's standard charts may be too large or extensive for your needs. A sparkline chart provides a simple way to show trends and variations in a range of data within a single cell. Excel includes three types of sparkline charts: line, column, and win/loss. Because sparkline charts appear in a single cell, you can use them to convey succinct, eye-catching summaries of the data they represent.

To Add a Sparkline Chart to the Worksheet

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Each row of monthly data, including those containing formulas, provides useful information that can be summarized by a line sparkline chart. *Why? A line sparkline chart is a good choice because it shows trends over the six-month period for each row of data.* The following steps add a line sparkline chart to cell I4 and then use the fill handle to create line sparkline charts in the range I5:I16 to represent the monthly data shown in rows 4 through 16.

- 1
- If necessary, scroll the worksheet so that both columns B and I and row 3 are visible on the screen.
- Select cell I4 to prepare to insert a sparkline chart in the cell.
- Display the Insert tab and then click the Line Sparkline button (Insert tab | Sparklines group) to display the Create Sparklines dialog box (Figure 3–36).

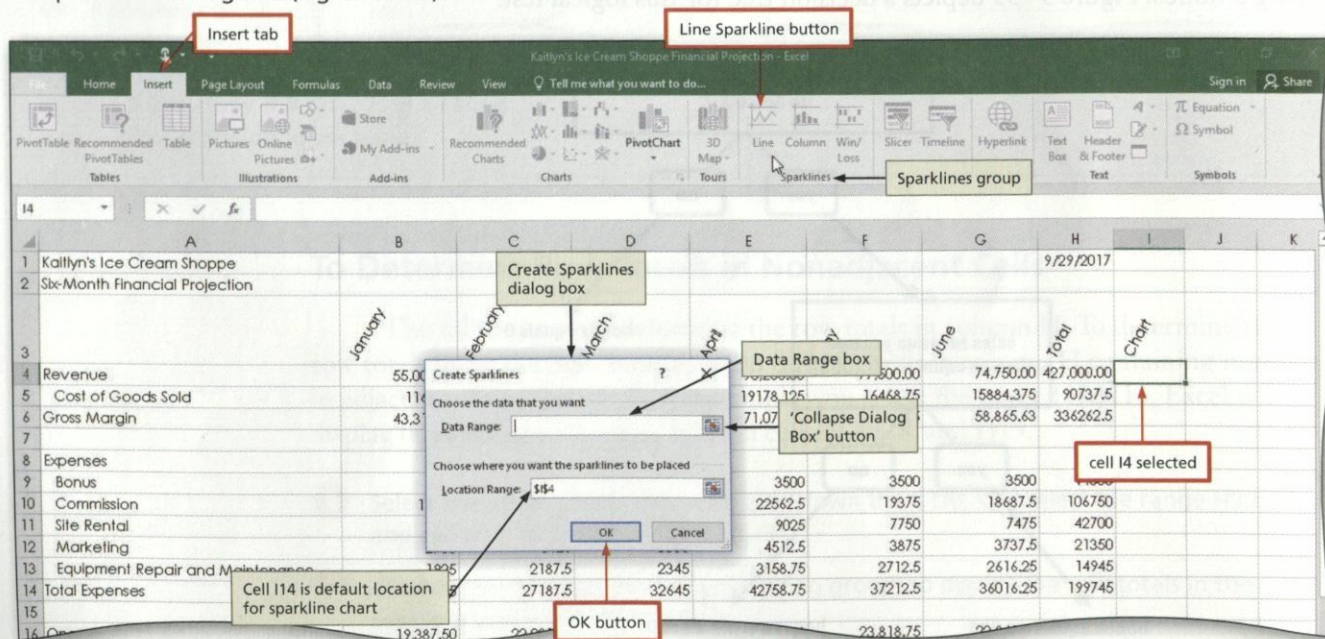


Figure 3–36

2

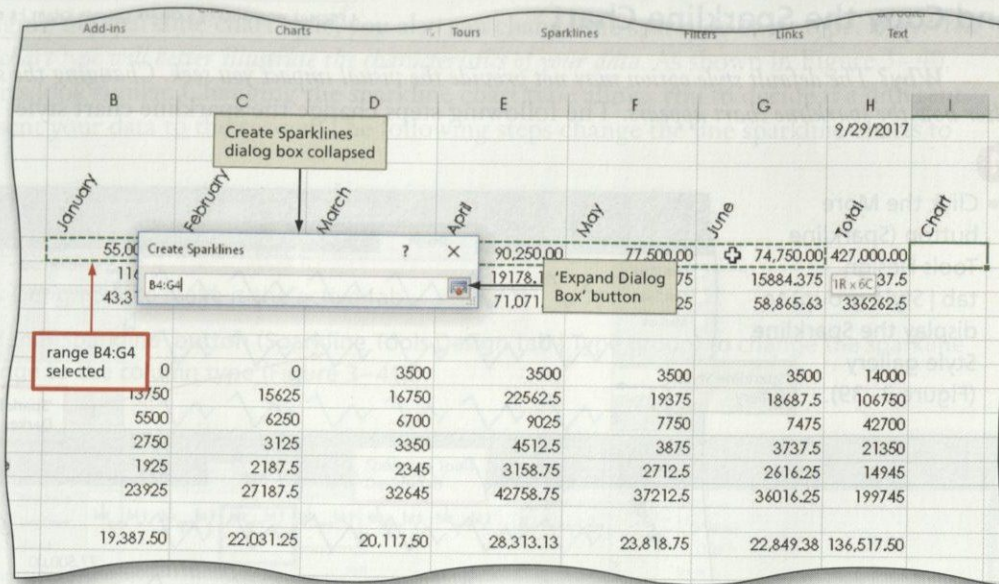
- Drag through the range B4:G4 to select the range. Do not release the mouse button (Figure 3-37).

Q&A

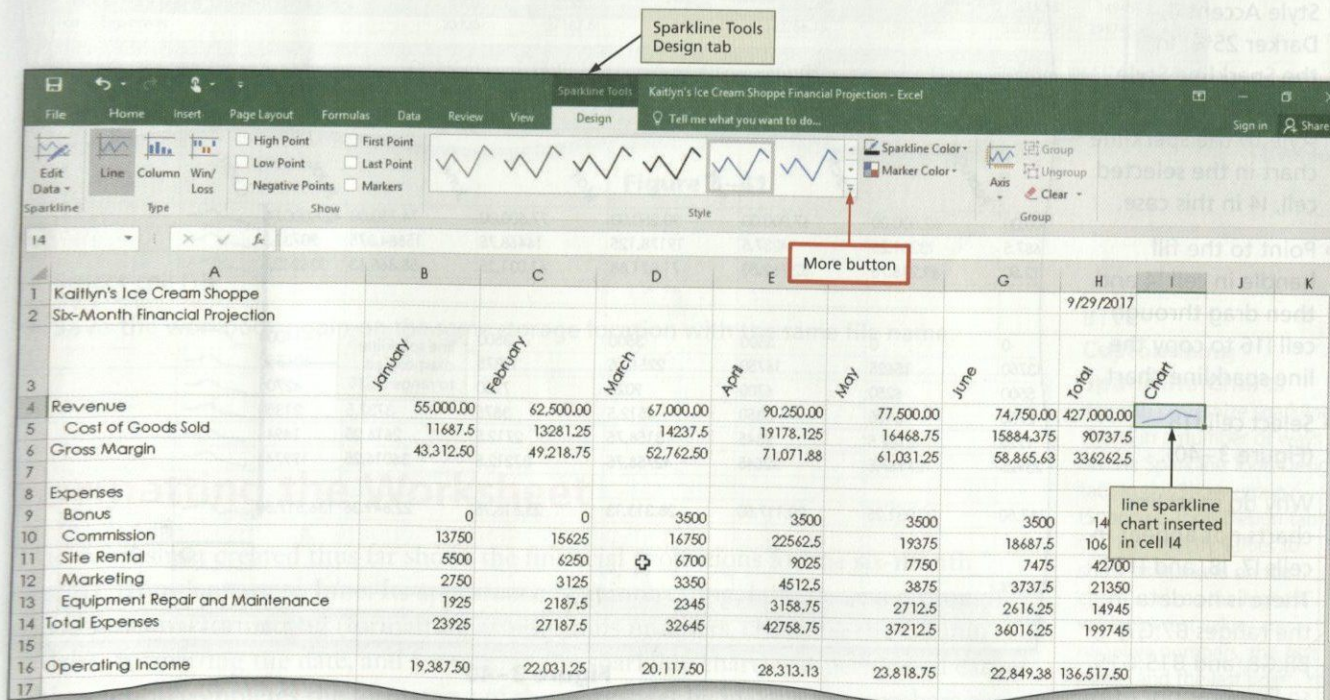
What happened to the Create Sparklines dialog box?

When a dialog box includes a 'Collapse Dialog Box' button (Figure 3-36), selecting cells or a range collapses the dialog box so that only the current text box is visible. This allows you to select your desired range

without the dialog box getting in the way. Once the selection is made, the dialog box expands back to its original size. You also can click the 'Collapse Dialog Box' button to make your selection and then click the 'Expand Dialog Box' button (Figure 3-37) to expand the dialog box.

**Figure 3-37****3**

- Release the mouse button to insert the selected range, B4:G4 in this case, in the Data Range box.
- Click the OK button shown in Figure 3-36 (Create Sparklines dialog box) to insert a line sparkline chart in the selected cell and display the Sparkline Tools Design tab (Figure 3-38).

**Figure 3-38**

To Change the Sparkline Style and Copy the Sparkline Chart

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? The default style option may not provide the visual impact you seek. Changing the sparkline style allows you to alter how the sparkline chart appears. The following steps change the sparkline chart style.

1

- Click the More button (Sparkline Tools Design tab | Style group) to display the Sparkline Style gallery (Figure 3-39).

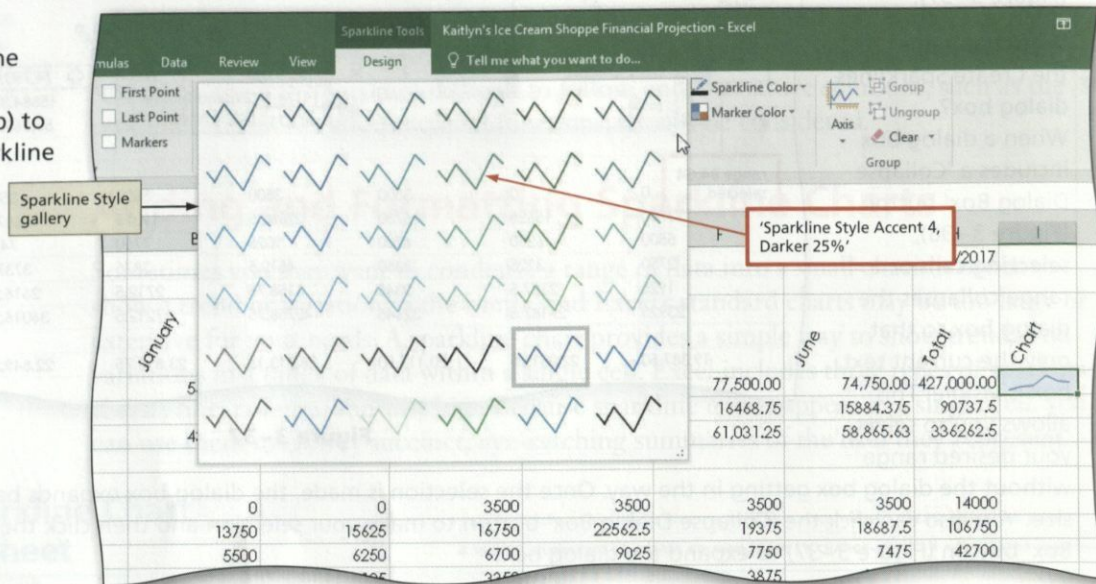


Figure 3-39

2

- Click 'Sparkline Style Accent 4, Darker 25%' in the Sparkline Style gallery to apply the style to the sparkline chart in the selected cell, I4 in this case.
- Point to the fill handle in cell I4 and then drag through cell I16 to copy the line sparkline chart.
- Select cell I18 (Figure 3-40).

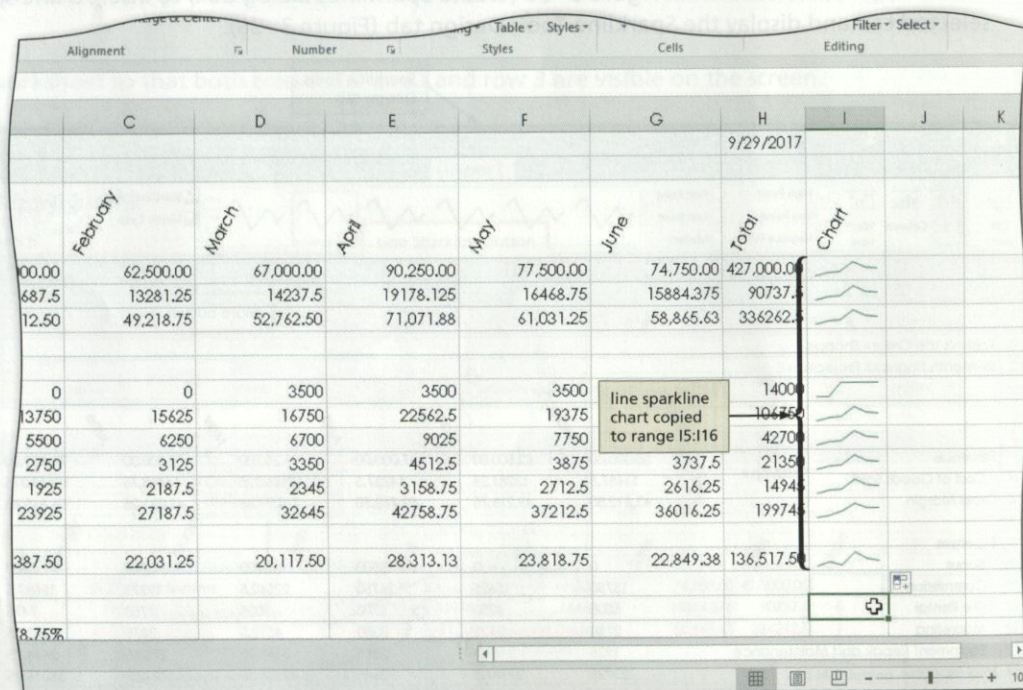


Figure 3-40

Q&A

Why do sparkline charts not appear in cells I7, I8, and I15? There is no data in the ranges B7:G7, B8:G8, and B15:G15, so Excel cannot draw

sparkline charts. If you added data to cells in those ranges, Excel would then generate line sparkline charts for those rows, because the drag operation defined sparkline charts for cells I7, I8, and I15.

To Change the Sparkline Type

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS

4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

In addition to changing the sparkline chart style, you also can change the sparkline chart type. *Why? You may decide that a different chart type will better illustrate the characteristics of your data.* As shown in Figure 3-40, most of the sparkline charts look similar. Changing the sparkline chart type allows you to decide if a different chart type will better present your data to the reader. The following steps change the line sparkline charts to column sparkline charts.

1

- Select the range I4:I16 to select the sparkline charts.
- Click the Sparkline Tools Design tab to make it the active tab.
- Click the 'Convert to Column Sparkline' button (Sparkline Tools Design tab | Type group) to change the sparkline charts in the selected range to the column type (Figure 3-41).

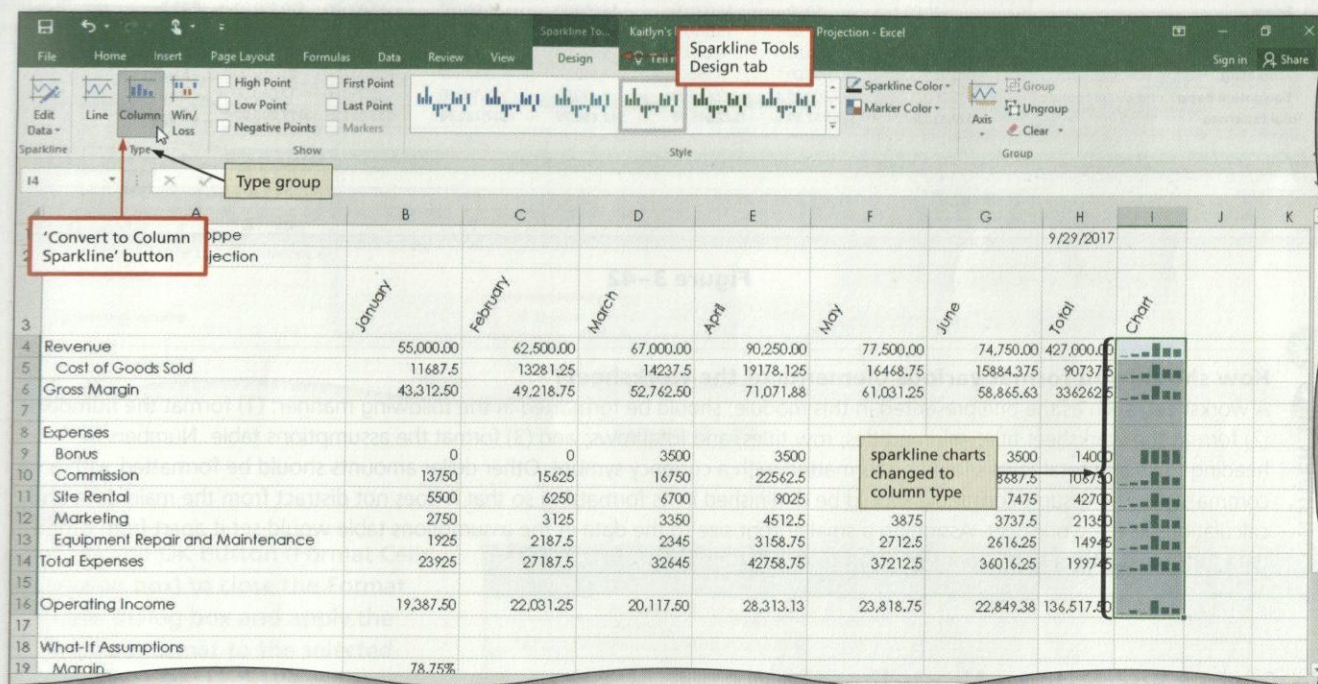


Figure 3-41

2

- Select cell I18.
- Save the workbook again on the same storage location with the same file name.

BTW

Customizing Sparkline Charts

You can customize sparkline charts in a number of ways on the Sparkline Tools Design tab. In the Show group (Sparkline Tools Design tab), you can specify values to show as markers on the chart, such as the highest value, lowest value, any negative numbers, the first point, and the last point. You can change the color of the sparkline and markers in the Style group (Sparkline Tools Design tab).

Formatting the Worksheet

The worksheet created thus far shows the financial projections for the six-month period, from January to June. Its appearance is uninteresting, however, even though some minimal formatting (formatting assumptions numbers, changing the column widths, formatting the date, and formatting the sparkline chart) was performed earlier. This section completes the formatting of the worksheet by making the numbers easier to read and emphasizing the titles, assumptions, categories, and totals, as shown in Figure 3-42.

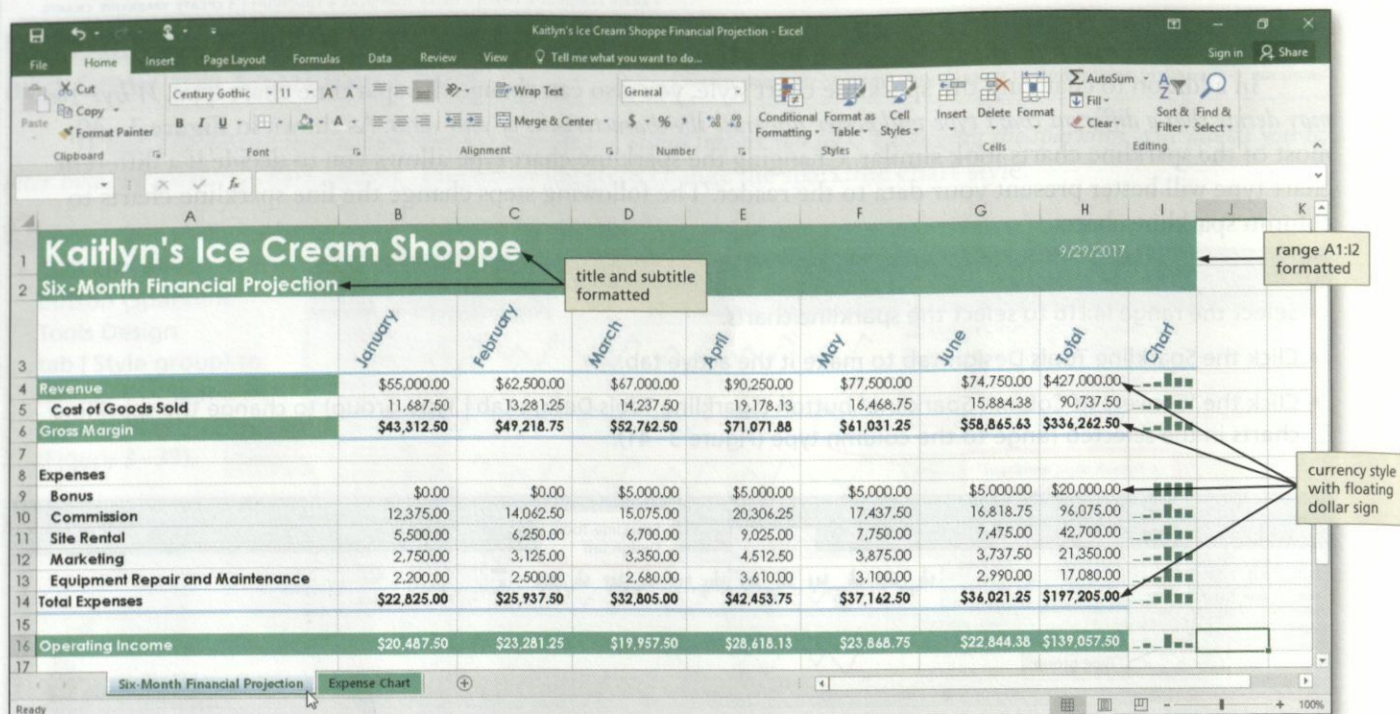


Figure 3-42



CONSIDER THIS

How should you format various elements of the worksheet?

A worksheet, such as the one presented in this module, should be formatted in the following manner: (1) format the numbers; (2) format the worksheet title, column titles, row titles, and total rows; and (3) format the assumptions table. Numbers in heading rows and total rows should be formatted with a currency symbol. Other dollar amounts should be formatted with a comma style. The assumptions table should be diminished in its formatting so that it does not distract from the main data and calculations in the worksheet. Assigning a smaller font size to the data in the assumptions table would set it apart from other data formatted with a larger font size.

To Assign Formats to Nonadjacent Ranges

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS

4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

The following steps assign formats to the numbers in rows 4 through 16. *Why? These formats increase the readability of the data.*

1

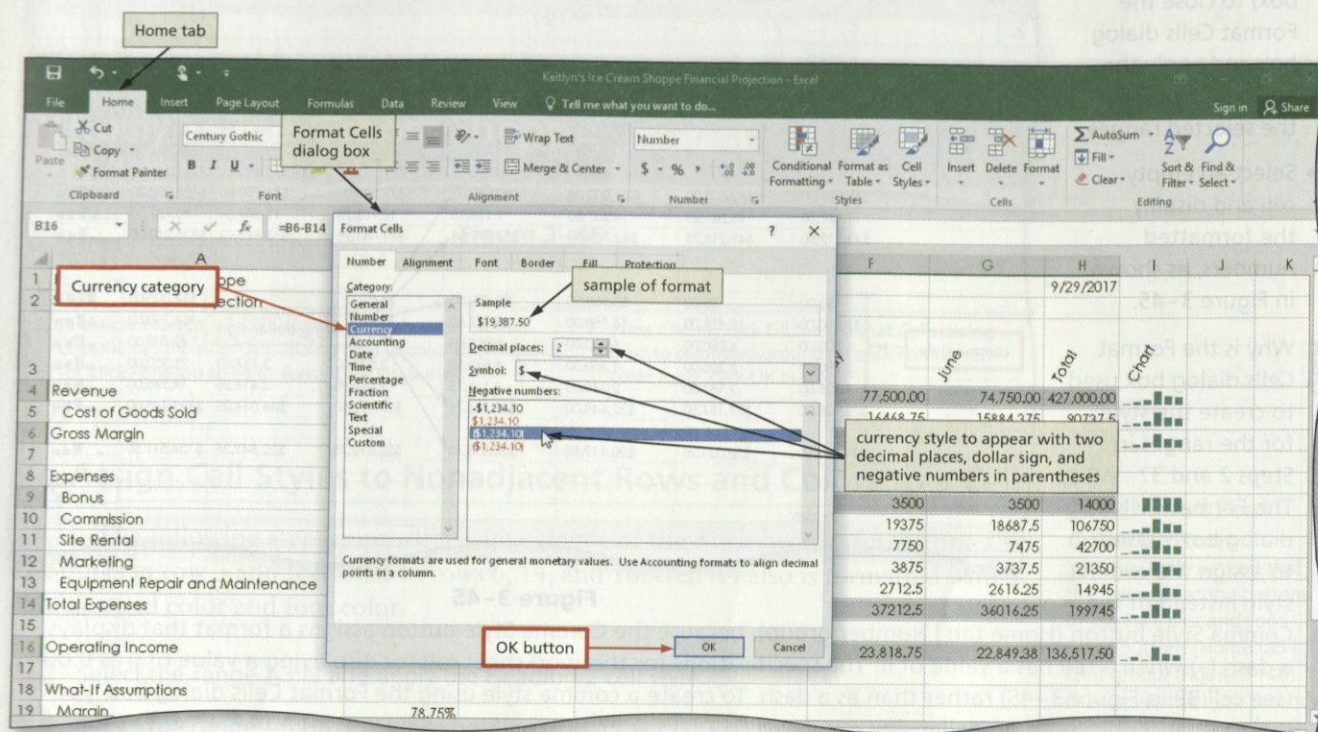
- Select the range B4:H4 as the first range to format.
- While holding down the CTRL key, select the nonadjacent ranges B6:H6, B9:H9, B14:H14, and B16:H16, and then release the CTRL key to select nonadjacent ranges.
- Click the Number Format Dialog Box Launcher (Home tab | Number group) to display the Format Cells dialog box.
- Click Currency in the Category list (Format Cells dialog box), if necessary select 2 in the Decimal places box and then select \$ in the Symbol list to ensure a dollar sign shows in the cells to be formatted, and select the black font color (\$1,234.10) in the Negative numbers list to specify the desired currency style for the selected ranges (Figure 3-43).

Q&A

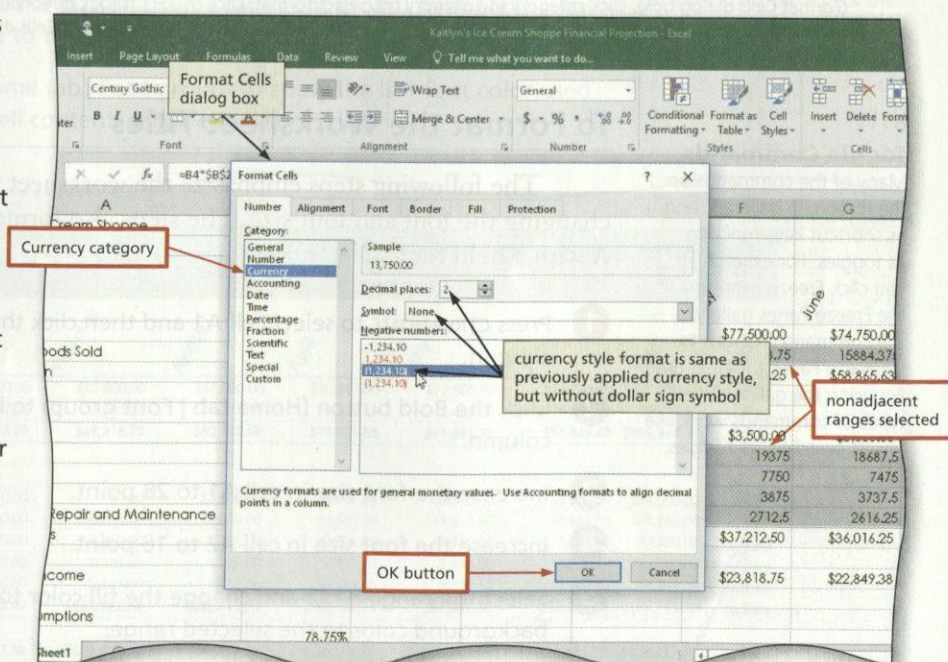
Why was this particular style chosen for the negative numbers?

In accounting, negative numbers often are shown with parentheses surrounding the value rather than with a negative sign preceding the value. Although the data being used in this module contains no negative numbers, you still must select a negative number format. It is important to be consistent when selecting negative number formats if you are applying different formats in a column; otherwise, the decimal points may not line up.

Q&A Why is the Format Cells dialog box used to create the format for the ranges in this step? The requirements for this worksheet call for a floating dollar sign. You can use the Format Cells dialog box to assign a currency style with a floating dollar sign, instead of using the 'Accounting Number Format' button (Home tab | Number group), which assigns a fixed dollar sign.

**Figure 3-43****2**

- Click the OK button (Format Cells dialog box) to close the Format Cells dialog box and apply the desired format to the selected ranges.
- Select the range B5:H5 as the next range to format.
- While holding down the CTRL key, select the range B10:H13, and then release the CTRL key to select nonadjacent ranges.
- Click the Number Format Dialog Box Launcher (Home tab | Number group) to display the Format Cells dialog box.
- Click Currency in the Category list (Format Cells dialog box), if necessary select 2 in the Decimal places box, select None in the Symbol list so that a dollar sign does not show in the cells to be formatted, and select the black font color (1,234.10) in the Negative numbers list (Figure 3-44).

**Figure 3-44**

3

- Click the OK button (Format Cells dialog box) to close the Format Cells dialog box and apply the desired format to the selected ranges.
- Select an empty cell and display the formatted numbers, as shown in Figure 3–45.

Q&A

Why is the Format Cells dialog box used to create the style for the ranges in Steps 2 and 3?

The Format Cells dialog box is used to assign the comma style instead of the

Comma Style button (Home tab | Number group), because the Comma Style button assigns a format that displays a dash (–) when a cell has a value of 0. The specifications for this worksheet call for displaying a value of 0 as 0.00 (see cell B9 in Figure 3–45) rather than as a dash. To create a comma style using the Format Cells dialog box, you use a currency style with no dollar sign.

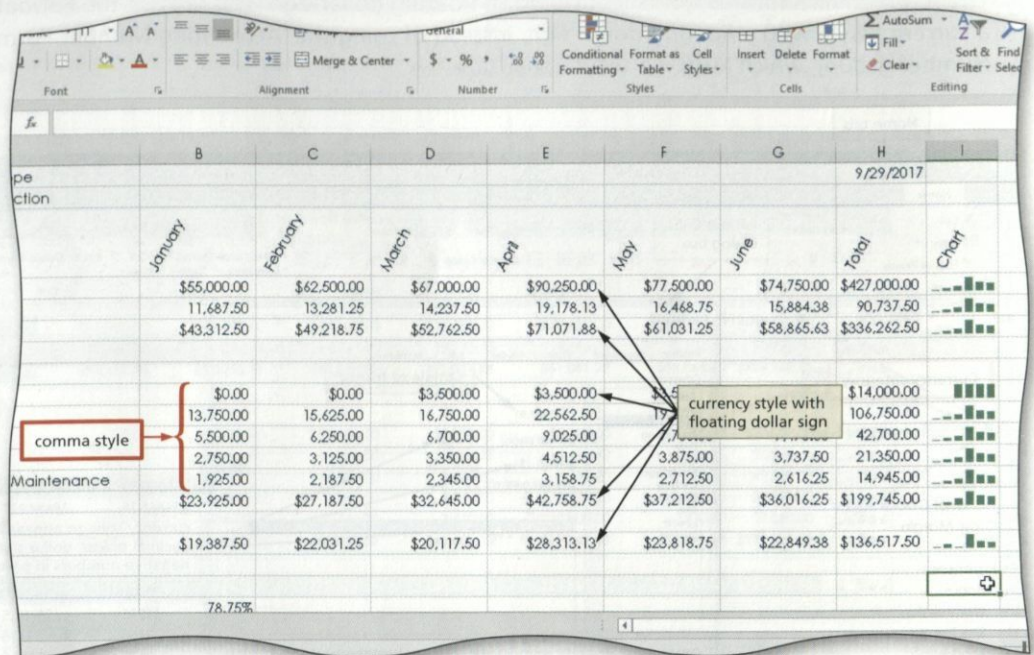


Figure 3–45

Other Ways

- Right-click range, click Format Cells on shortcut menu, click Number tab (Format Cells dialog box), click category in Category list, select format, click OK button (Format Cells dialog box)
- Press CTRL+1, click Number tab (Format Cells dialog box), click category in Category list, select format, click OK button (Format Cells dialog box)

BTW

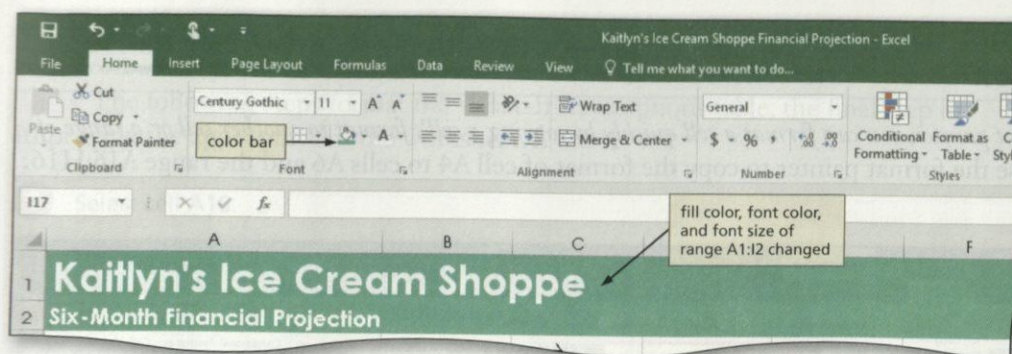
Toggle Commands

Many of the commands on the ribbon, in galleries, and as shortcut keys function as toggles. For example, if you click Freeze Panes in the Freeze Panes gallery, the command changes to Unfreeze Panes the next time you view the gallery. These types of commands work like on-off switches, or toggles.

To Format the Worksheet Titles

The following steps emphasize the worksheet titles in cells A1 and A2 by changing the font and font size. The steps also format all of the row headers in column A with a bold font style.

- Press CTRL+HOME to select cell A1 and then click the column A heading to select the column.
- Click the Bold button (Home tab | Font group) to bold all of the data in the selected column.
- Increase the font size in cell A1 to 28 point.
- Increase the font size in cell A2 to 16 point.
- Select the range A1:I2 and change the fill color to Green, Accent 4 to add a background color to the selected range.
- With A1:I2 selected, change the font color to White, Background 1.
- Click an empty cell to deselect the range (Figure 3–46).

**Figure 3-46****Other Ways**

1. Right-click range, click Format Cells on shortcut menu, click Fill tab (Format Cells dialog box) to color background (or click Font tab to color font), click OK button
2. Press CTRL+1, click Fill tab (Format Cells dialog box) to color background (or click Font tab to color font), click OK button

To Assign Cell Styles to Nonadjacent Rows and Colors to a Cell

The following steps improve the appearance of the worksheet by formatting the headings in row 3 and the totals in rows 6, 14, and 16. Cell A4 also is formatted with a background color and font color.

- 1 Select the range A3:I3 and apply the Heading 2 cell style.
- 2 Select the range A6:H6 and while holding down the CTRL key, select the ranges A14:H14 and A16:H16.
- 3 Apply the Total cell style to the selected nonadjacent ranges.
- 4 Select cell A4 and click the Fill Color button (Home tab | Font group) to apply the last fill color used (Green, Accent 4) to the cell contents.
- 5 Click the Font Color button (Home tab | Font group) to apply the last font color used (White, Background 1) to the cell contents (Figure 3-47).

BTW

The Fill and Font Color Buttons

You may have noticed that the color bar at the bottom of the Fill Color and Font Color buttons (Home tab | Font group) (Figure 3-46) changes to the most recently selected color. To apply this same color to a cell background or text, select a cell and then click the Fill Color button to use the color as a background or click the Font Color button to use the color as a font color.

	January	February	March	April	May	June	Total	Chart
Revenue	\$55,000.00	\$62,500.00	\$67,000.00	\$90,250.00	\$77,500.00	\$74,750.00	\$427,000.00	
Cost of Goods Sold	11,687.50	13,281.25	14,237.50	19,178.13	16,468.75	15,884.38	90,737.50	
Gross Margin	\$43,312.50	\$49,218.75	\$52,762.50	\$71,071.88	\$61,031.25	\$58,865.63	\$336,262.50	
Expenses								
Bonus	\$0.00	\$0.00	\$3,500.00	\$3,500.00	\$3,500.00	\$3,500.00	\$14,000.00	
Commission	13,750.00	15,625.00	16,750.00	22,562.50	19,375.00	18,687.50	106,750.00	
Site Rental	5,500.00	6,250.00	6,700.00	9,025.00	7,750.00	7,475.00	42,700.00	
Marketing	2,750.00	3,125.00	3,350.00	4,512.50	3,875.00	3,737.50	21,350.00	
Equipment Repair and Maintenance	1,925.00	2,187.50	2,345.00	3,158.75	2,712.50	2,616.25	14,945.00	
Total Expenses	\$23,925.00	\$27,187.50	\$32,645.00	\$42,758.75	\$37,212.50	\$36,016.25	\$199,745.00	
Operating Income	\$19,387.50	\$22,031.25	\$20,117.50	\$28,313.13	\$23,818.75	\$22,849.38	\$136,517.50	

Figure 3-47

To Copy a Cell's Format Using the Format Painter Button

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? Using the format painter, you can format a cell quickly by copying a cell's format to another cell or a range of cells. The following steps use the format painter to copy the format of cell A4 to cells A6 and the range A16:H16.

1

- If necessary, click cell A4 to select a source cell for the format to paint.
- Double-click the Format Painter button (Home tab | Clipboard group) and then move the pointer onto the worksheet to cause the pointer to change to a block plus sign with a paintbrush (Figure 3-48).

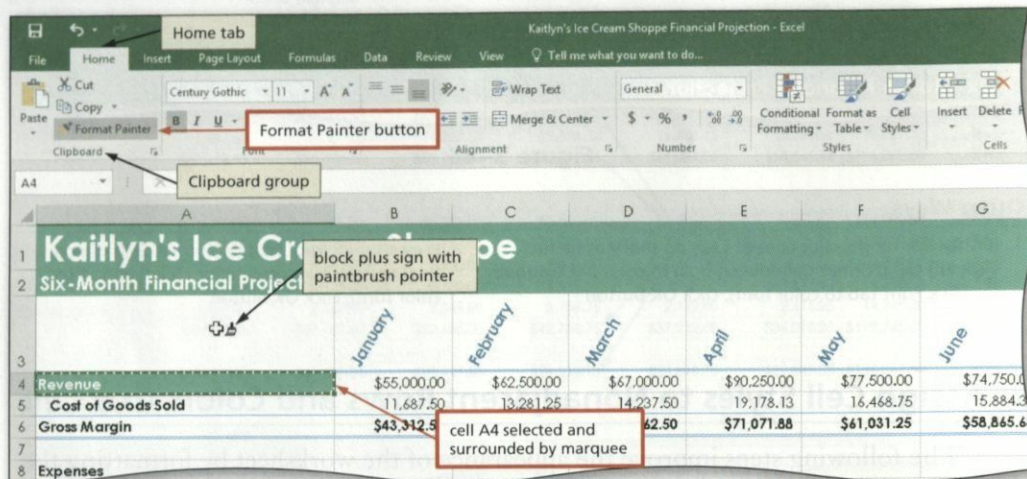


Figure 3-48

2

- Click cell A6 to assign the format of the source cell, A4 in this case, to the destination cell, A6 in this case.
- With the pointer still a block plus sign with a paintbrush, drag through the range A16:H16 to assign the format of the source cell, A4 in this case, to the destination range, A16:H16 in this case.
- Click the Format Painter button or press the ESC key to turn off the format painter.
- Apply the currency style to the range B16:H16 to cause the cells in the range to appear with a floating dollar sign and two decimal places (Figure 3-49).

Q&A Why does the currency style need to be reapplied to the range B16:H16? Sometimes, the use of the format painter results in unintended outcomes. In this case, changing the background fill color and font color for the range B16:H16 resulted in the loss of the currency style because the format being copied did not include the currency style. Reapplying the currency style to the range results in the proper number style, fill color, and font color.

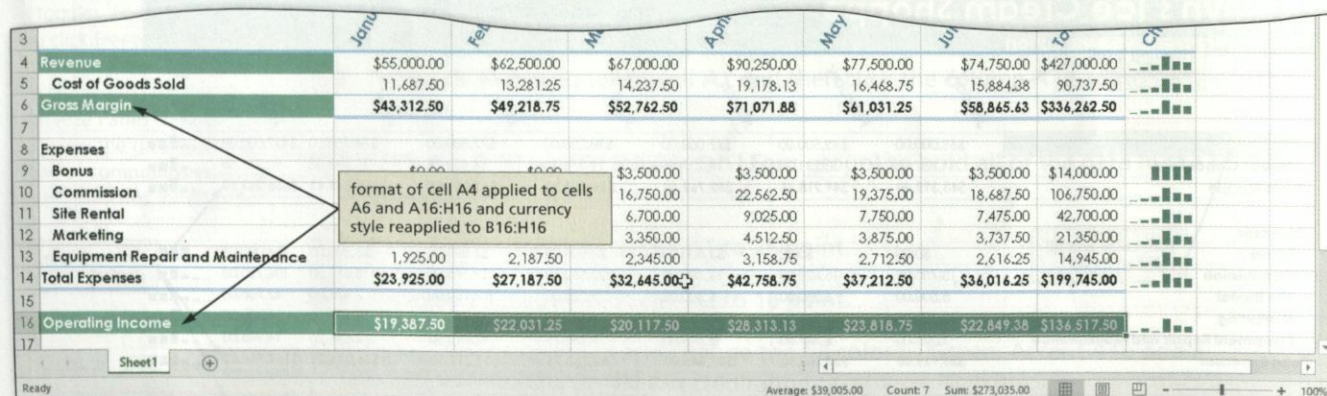


Figure 3-49

Other Ways

1. Click Copy button (Home tab | Clipboard group), select cell, click Paste arrow (Home tab | Clipboard group), click Formatting button in Paste gallery
2. Right-click cell, click Copy on shortcut menu, right-click cell, click Formatting icon on shortcut menu

To Format the What-If Assumptions Table

The following steps format the What-If Assumptions table, the final step in improving the appearance of the worksheet.

- 1** Select cell A18.
- 2** Change the font size to 8 pt.
- 3** Italicize and underline the text in cell A18.
- 4** Select the range A19:B25, and change the font size to 8 pt.
- 5** Select the range A18:B25 and then click the Fill Color button (Home tab | Font group) to apply the most recently used background color to the selected range.
- 6** Click the Font Color button (Home tab | Font group) to apply the most recently used font color to the selected range.
- 7** Deselect the range A18:B25 and display the What-If Assumptions table, as shown in Figure 3–50.
- 8** Save the workbook on the same storage location with the same file name.

Q&A What happens when I click the Italic and Underline buttons?
When you assign the italic font style to a cell, Excel slants the characters slightly to the right, as shown in cell A18 in Figure 3–50. The underline format underlines only the characters in the cell, rather than the entire cell, as is the case when you assign a cell a bottom border.

16	Operating Income		\$22,031.25	\$20,117.50	\$28,313.13	\$23,818.75	\$22,849.3
17							
18	<i><u>What-If Assumptions</u></i>						
19	Margin	76.75%					
20	Bonus	3,500.00					
21	Sales Revenue for Bonus	65,000.00					
22	Commission	25.00%					
23	Site Rental	10.00%					
24	Marketing	5.00%					
25	Equipment Repair and Maintenance	3.50%					
26							

Figure 3–50

Break Point: If you wish to take a break, this is a good place to do so. You can exit Excel now. To resume at a later time, run Excel, open the file called Kaitlyn's Ice Cream Shoppe Financial Projection, and continue following the steps from this location forward.

Adding a Clustered Column Chart to the Workbook

The next step in the module is to create a clustered column chart on a separate sheet in the workbook, as shown in Figure 3–51. Use a clustered column chart to compare values side by side, broken down by category. Each column shows the value for a particular category, by month in this case.

The clustered column chart in Figure 3–51 shows the projected expense amounts, by category, for each of the six months. The clustered column chart allows the user to see how the various expense categories compare with each other each month, and across months.

Recall that charts can either be embedded in a worksheet or placed on a separate chart sheet. The clustered column chart will reside on its own sheet, because if placed on the worksheet, it would not be visible when the worksheet first opens and could be missed.

BTW

Painting a Format to Nonadjacent Ranges

Double-click the Format Painter button (Home tab | Clipboard group) and then drag through the nonadjacent ranges to paint the formats to the ranges. Click the Format Painter button again to deactivate it.

BTW

Selecting Nonadjacent Ranges

One of the more difficult tasks to learn is selecting nonadjacent ranges. To complete this task, do not hold down the CTRL key when you select the first range because Excel will consider the current active cell to be the first selection, and you may not want the current active cell in the selection. Once the first range is selected, hold down the CTRL key and drag through the nonadjacent ranges. If a desired range is not visible in the window, use the scroll arrows to view the range. You need not hold down the CTRL key while you scroll.

BTW

Charts

When you change a value on which a chart is dependent, Excel immediately redraws the chart based on the new value. With bar charts, you can drag the bar in the chart in one direction or another to change the corresponding value in the worksheet.

BTW

Chart Items

When you rest the pointer over a chart item, such as a legend, bar, or axis, Excel displays a chart tip containing the name of the item.

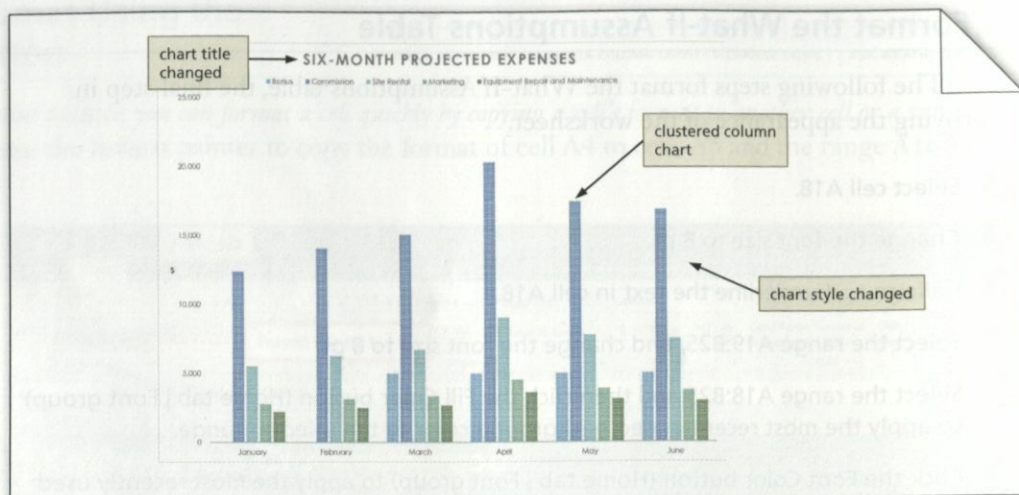


Figure 3-51

In this worksheet, the ranges to chart are the nonadjacent ranges B3:G3 (month names) and A9:G13 (monthly projected expenses, by category). The month names in the range B3:G3 will identify the major groups for the chart; these entries are called **category names**. The range A9:G13 contains the data that determines the individual columns in each month cluster, along with the names that identify each column; these entries are called the **data series**. Because six months of five expense categories are being charted, the chart will contain six clusters of five columns each, unless a category has the value of zero for a given month.

To Draw a Clustered Column Chart on a Separate Chart Sheet Using the Recommended Charts Feature

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? This Excel feature evaluates the selected data and makes suggestions regarding which chart types will provide the most suitable representation. The following steps use the Recommended Charts feature to draw the clustered column chart on a separate chart sheet.

1

- Select the range A3:G3 to identify the range of the categories.
- Hold down the CTRL key and select the data range A9:G13.
- Display the Insert tab.
- Click the Recommended Charts button (Insert tab | Charts group) to display the Insert Chart dialog box with the Recommended Charts tab active (Figure 3-52).

**Experiment**

- Click the various recommended chart types, reading the description for each of its best use and examining the chart preview.

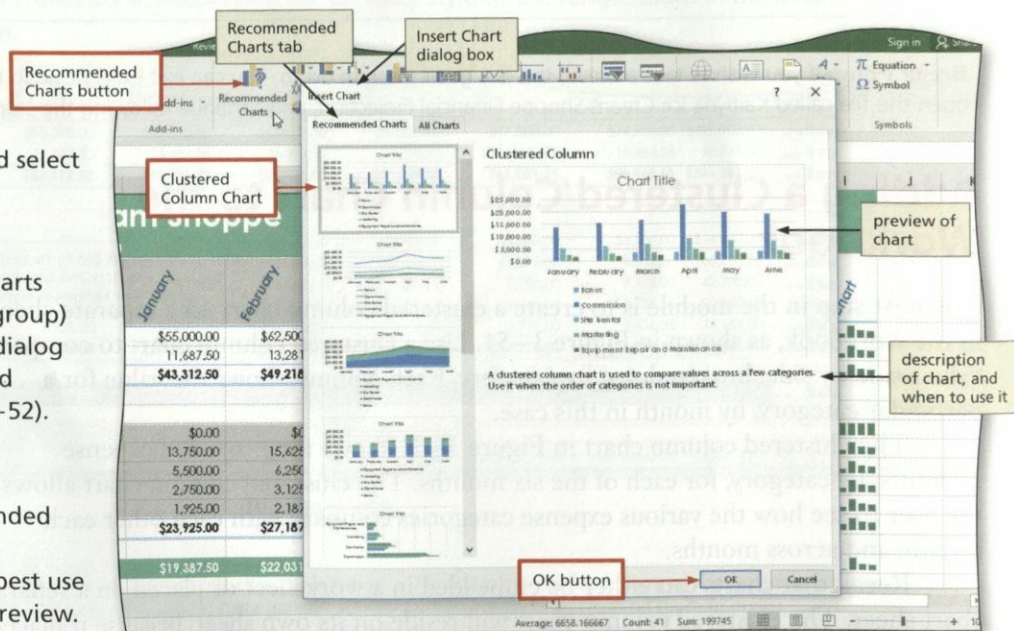
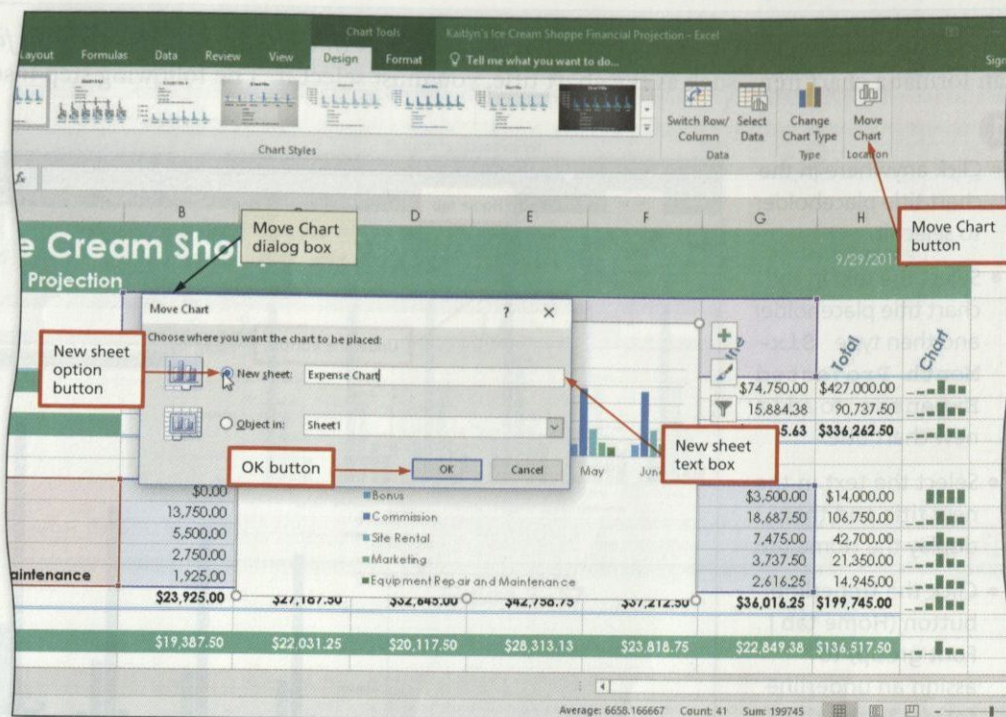


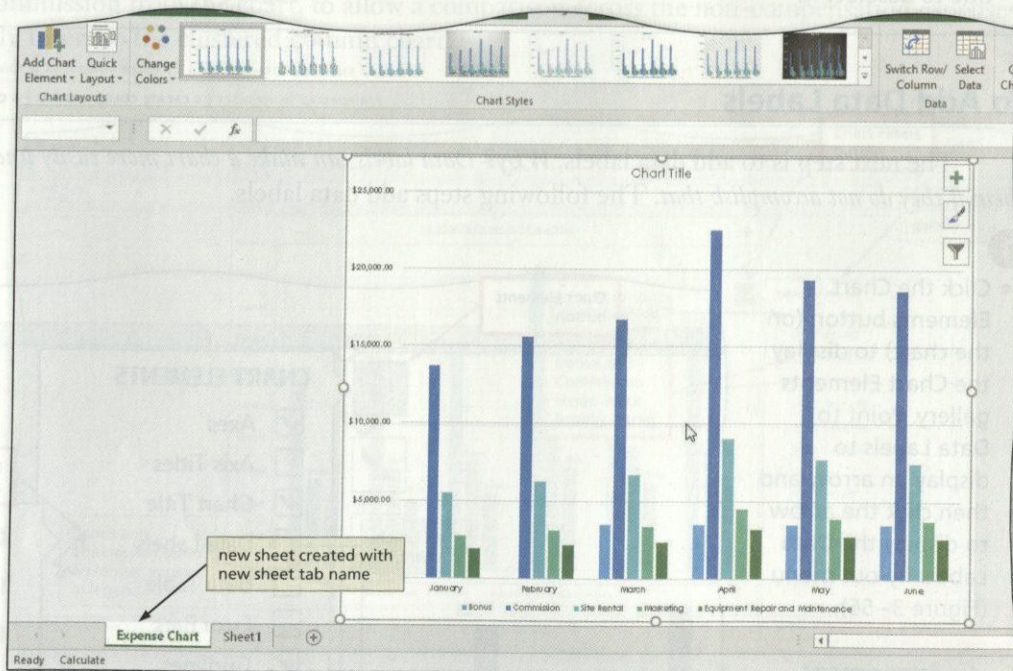
Figure 3-52

2

- Click the first Clustered Column recommended chart to select it and then click the OK button (Insert Chart dialog box).
- When Excel draws the chart, click the Move Chart button (Chart Tools Design tab | Location group) to display the Move Chart dialog box.
- Click New sheet (Move Chart dialog box) and then type **Expense Chart** in the New sheet text box to enter a sheet tab name for the chart sheet (Figure 3-53).

**Figure 3-53****3**

- Click the OK button (Move Chart dialog box) to move the chart to a new chart sheet with a new sheet tab name, **Expense Chart** (Figure 3-54).

**Figure 3-54****Q&A**

Why do January and February have only four columns charted? Both January and February have a value of \$0 for the Bonus category. Values of zero are not charted in a column chart, so these two months have one fewer column than the other months.

Other Ways

- Select range to chart, PRESS F11

To Insert a Chart Title

The next step is to insert a chart title. *Why?* A chart title identifies the chart content for the viewer. Before you can format a chart item, such as the chart title, you must select it. The following step inserts a chart title.

1

- Click anywhere in the chart title placeholder to select it.
- Select the text in the chart title placeholder and then type **Six-Month Projected Expenses** to add a new chart title.
- Select the text in the new title and then display the Home tab.
- Click the Underline button (Home tab | Font group) to assign an underline format to the chart title (Figure 3-55).
- Click anywhere outside of the chart title to deselect it.

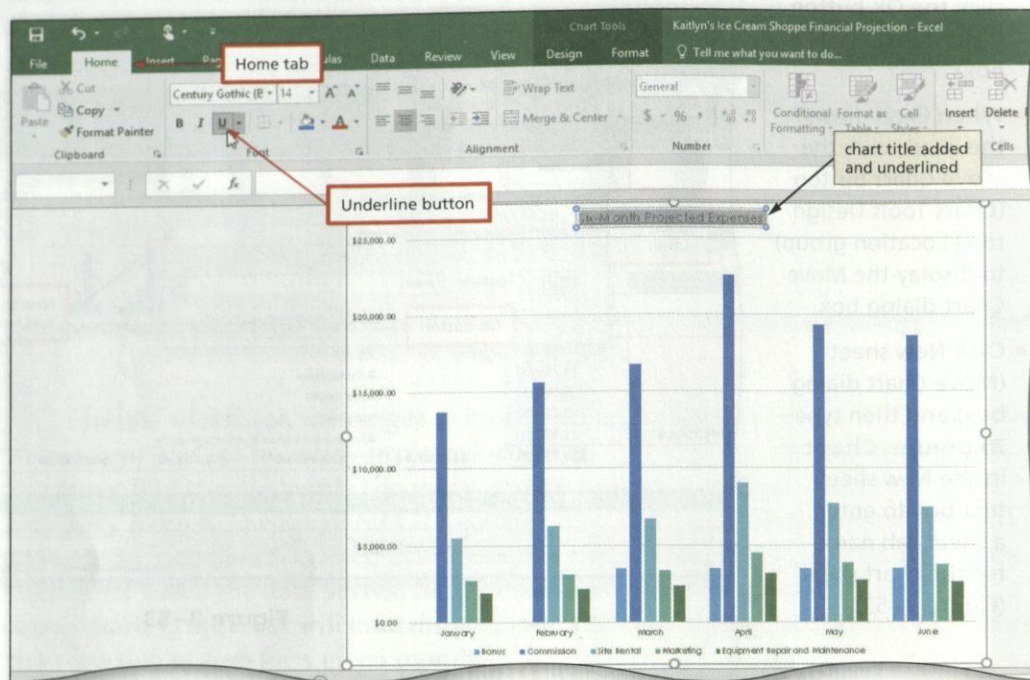


Figure 3-55

To Add Data Labels

The next step is to add data labels. *Why?* Data labels can make a chart more easily understood. You can remove them if they do not accomplish that. The following steps add data labels.

1

- Click the Chart Elements button (on the chart) to display the Chart Elements gallery. Point to Data Labels to display an arrow and then click the arrow to display the Data Labels fly-out menu (Figure 3-56).



Experiment

- If you are using a mouse, point to each option on the Data Labels fly-out menu to see a live preview of the data labels.

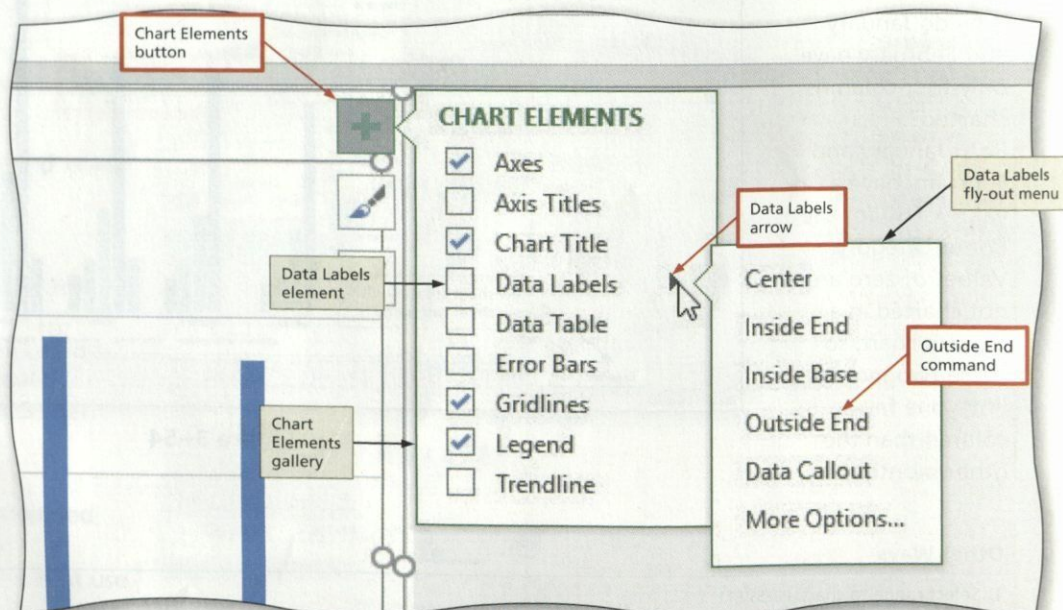
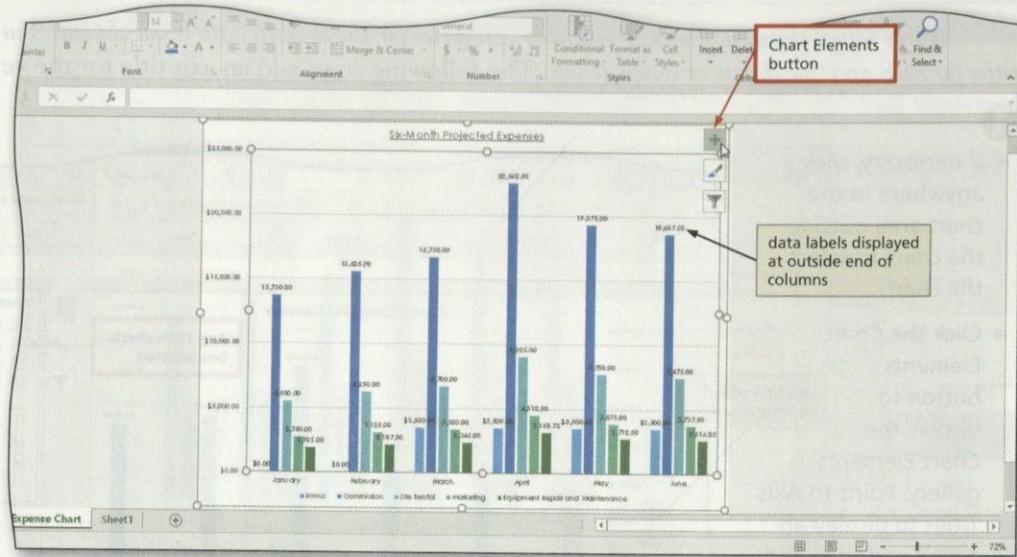


Figure 3-56

2

- Click Outside End on the Data Labels fly-out menu so that data labels are displayed outside the chart at the end of each column.
- Click the Chart Elements button to close the gallery (Figure 3-57).

**Figure 3-57**

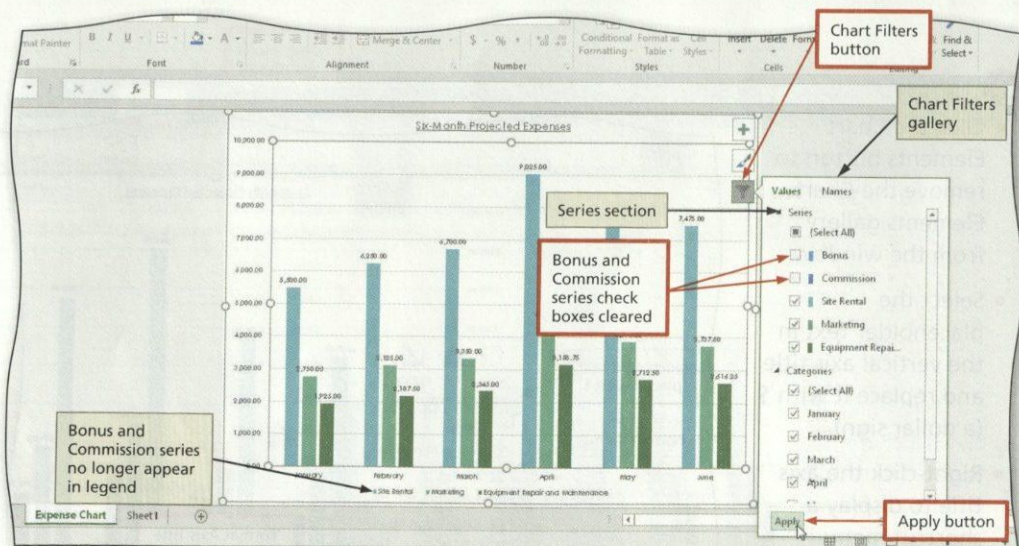
To Apply Chart Filters

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? With some data, you may find that certain data series or categories make it difficult to examine differences and patterns between other series or categories. Excel allows you to easily filter data series and categories to allow more in-depth examinations of subsets of data. In this case, filters can be used to temporarily remove the compensation categories Bonus and Commission from the chart, to allow a comparison across the non-compensation expenses. The following steps apply filters to the clustered column chart.

1

- Click the Chart Filters button (on the chart) to display the Chart Filters gallery.
- In the Series section, click the Bonus and Commission check boxes to remove their check marks and then click the Apply button to filter these series from the chart (Figure 3-58).

**Figure 3-58**

Q&A What happens when I remove the check marks from Bonus and Commission?

When you remove the check marks from Bonus and Commission, Excel filters the Bonus and Commission series out and redraws the chart without them.

2

- Click the Chart Filters button to close the gallery.

To Add an Axis Title to the Chart

Why? Often the unit of measurement or categories for the charted data is not obvious. You can add an axis title, or titles for both axes, for clarity or completeness. The following steps add an axis title for the vertical axis.

1

- If necessary, click anywhere in the chart area outside the chart to select the chart.
- Click the Chart Elements button to display the Chart Elements gallery. Point to Axis Titles to display an arrow and then click the arrow to display the Axis Titles fly-out menu.

axis title added to vertical axis

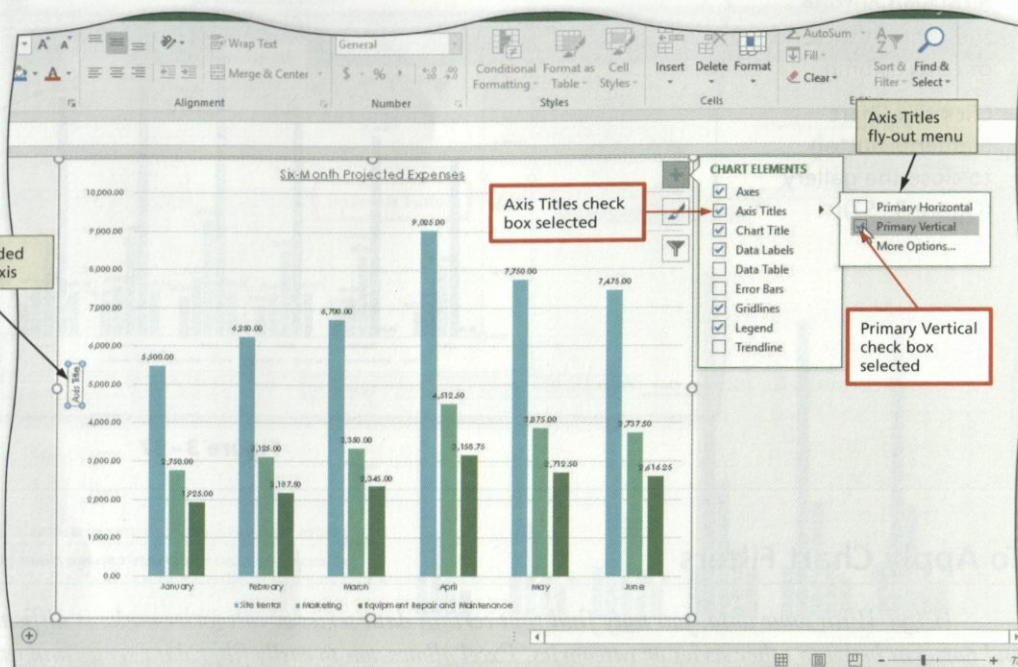


Figure 3-59

Experiment

- Point to each option on the fly-out menu to see a live preview of the axes' titles.
- Click Primary Vertical on the Axis Titles fly-out menu to add an axis title to the vertical axis (Figure 3-59).

2

- Click the Chart Elements button to remove the Chart Elements gallery from the window.
- Select the placeholder text in the vertical axis title and replace it with \$ (a dollar sign).
- Right-click the axis title to display a shortcut menu (Figure 3-60).

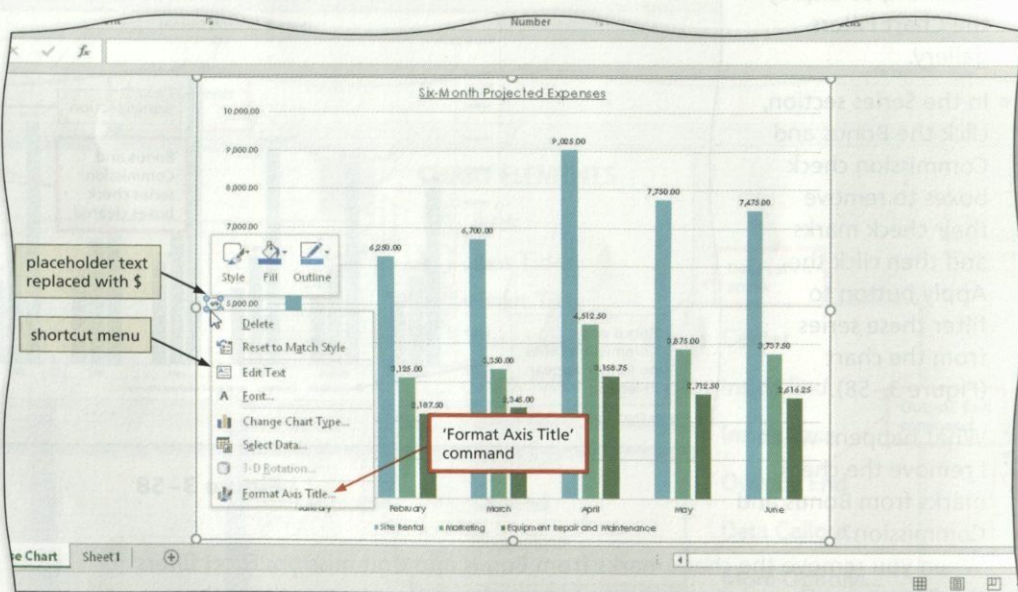
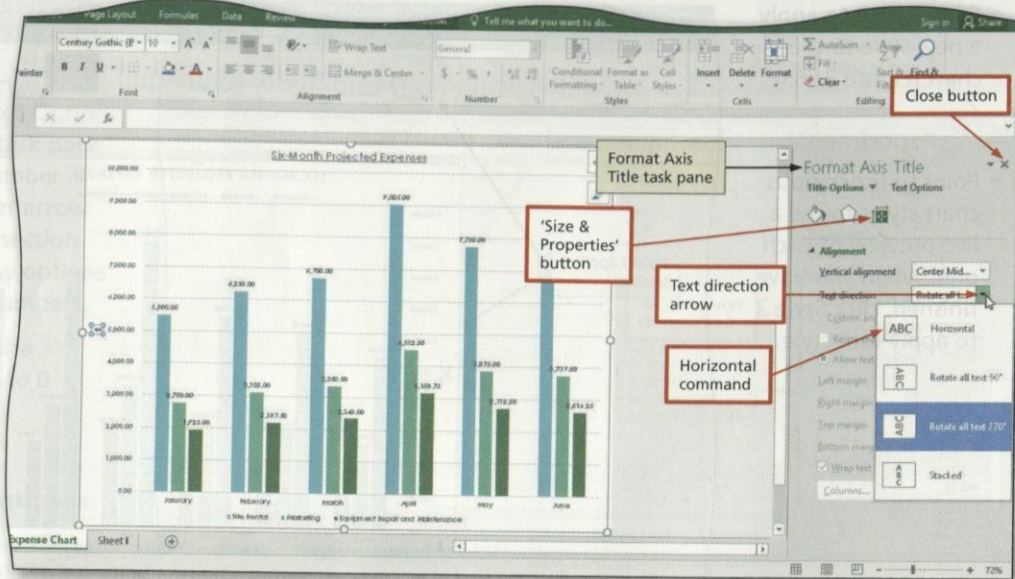


Figure 3-60

3

- Click 'Format Axis Title' on the shortcut menu to open the Format Axis Title task pane.
- If necessary, click the Title Options tab, click the 'Size & Properties' button, and then, if necessary, click the Alignment arrow to expand the Alignment section.
- Click the Text direction arrow to display the Text direction list (Figure 3-61).

**Figure 3-61**

- Click Horizontal in the Text direction list to change the orientation of the vertical axis title.
- Click the Close button (shown in Figure 3-61) on the task pane to close the Format Axis Title task pane.

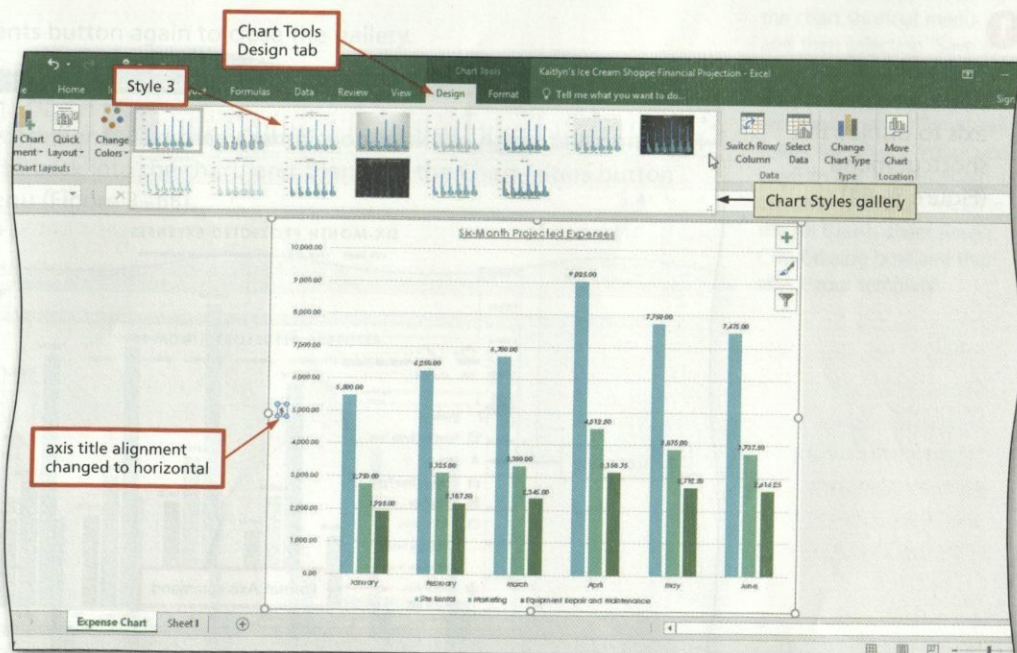
To Change the Chart Style

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? You decide that a chart with a different look would better convey meaning to viewers. The following steps change the chart style.

1

- Click the More button (Chart Tools Design tab | Chart Styles group) (shown in Figure 3-61) to display the Chart Styles gallery (Figure 3-62).

**Figure 3-62**

2

- Click Style 3 to apply a new style to the chart (Figure 3–63).

**Experiment**

- Point to the various chart styles to see a live preview of each one. When you have finished, click Style 3 to apply that style.

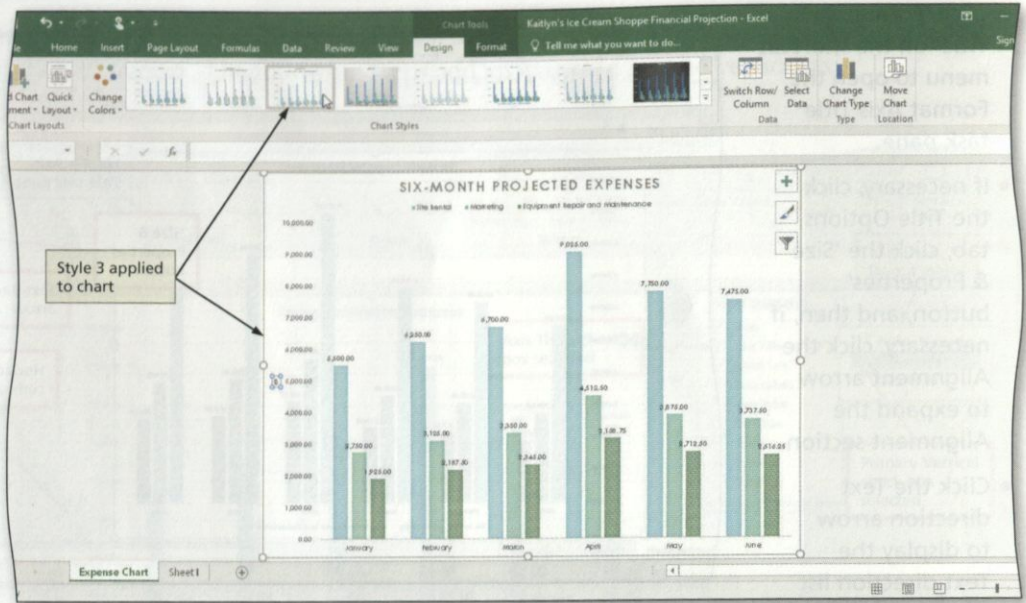


Figure 3–63

To Modify the Chart Axis Number Format

1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

Why? The two decimal places in the vertical chart axis numbers are not necessary and make the axis appear cluttered. The following steps format the numbers in the chart axis to contain no decimal places.

1

- Right-click any value on the vertical axis to display the shortcut menu (Figure 3–64).

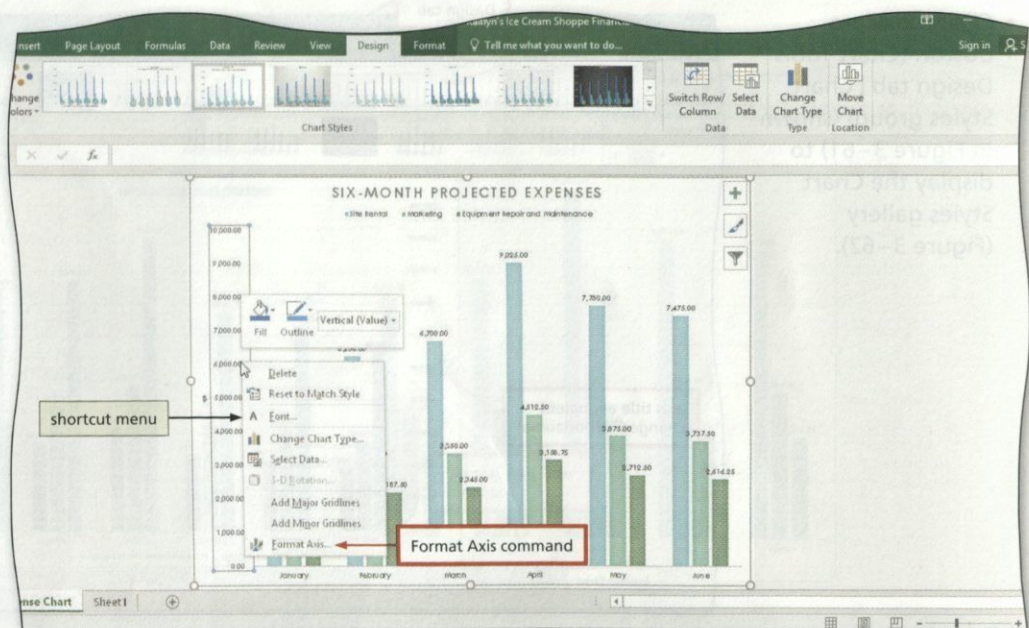
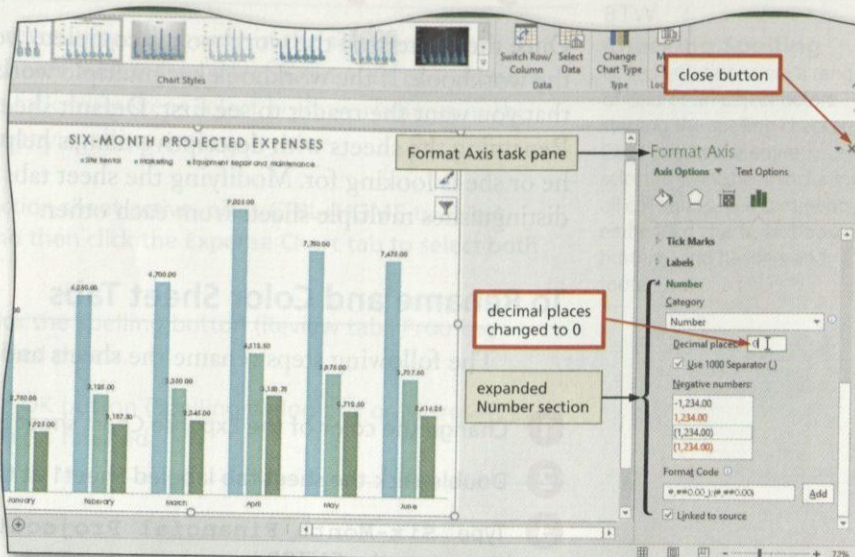


Figure 3–64

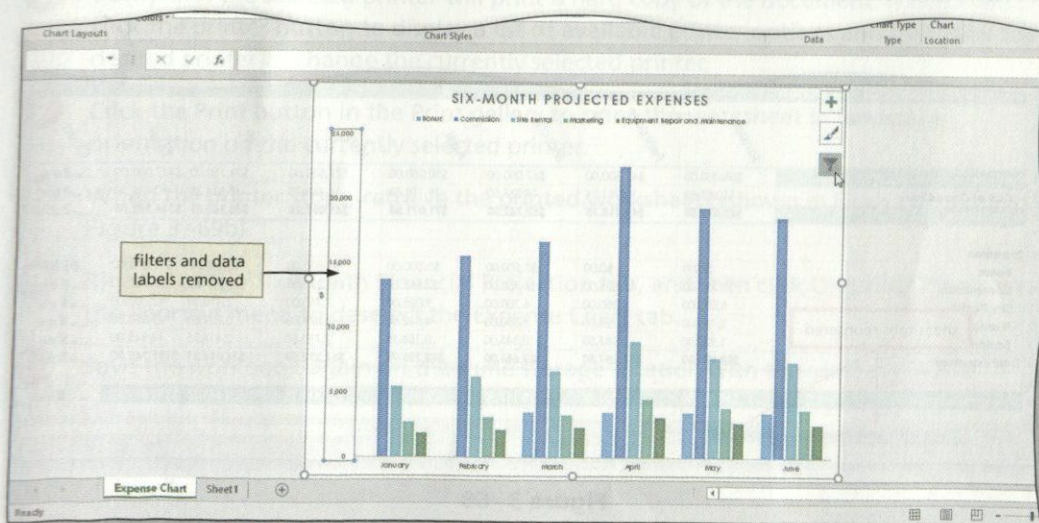
- 2
 - Click Format Axis on the shortcut menu to open the Format Axis task pane.
 - If necessary, click the Axis Options tab in the Format Axis task pane and then scroll until Number is visible. Click the Number arrow to expand the Number section and then scroll to review options related to formatting numbers.
 - Change the number in the Decimal places text box to 0 (Figure 3–65).
- 3
 - Close the Format Axis task pane.

**Figure 3–65**

To Remove Filters and Data Labels

You decide that the data labels on the bars are distracting and add no value to the chart. You decide to remove the data labels and filters so that all expense data is once again visible. The following steps remove the data labels and the filters.

- 1 Click the Chart Elements button to display the Chart Elements gallery.
- 2 Click the Data Labels check box to remove the check mark for the data labels.
- 3 Click the Chart Elements button again to close the gallery.
- 4 Click the Chart Filters button to display the Chart Filters fly-out menu.
- 5 In the Series section, click Bonus and then Commission, click the Apply button to add the compensation data back into the chart, and then click the Chart Filters button again to close the menu (Figure 3–66).

**Figure 3–66**

BTW

Chart Templates

Once you create and format a chart to your liking, consider saving the chart as a template so that you can use it to format additional charts. Save your chart as a chart template by accessing the chart shortcut menu and then selecting 'Save as Template' from that shortcut menu. The chart template will appear in the Templates folder for Charts. When you want to use the template, click the Templates folder in the All Charts sheet (Insert Chart dialog box) and then select your template.

Organizing the Workbook

Once the content of the workbook is complete, you can address the organization of the workbook. If the workbook has multiple worksheets, place the worksheet on top that you want the reader to see first. Default sheet names in Excel are not descriptive. Renaming the sheets with descriptive names helps the reader find information that he or she is looking for. Modifying the sheet tabs through the use of color further distinguishes multiple sheets from each other.

To Rename and Color Sheet Tabs

The following steps rename the sheets and color the sheet tabs.

- 1 Change the color of the Expense Chart sheet tab to Green, Accent 4 (column 8, row 1).
- 2 Double-click the sheet tab labeled Sheet1 at the bottom of the screen.
- 3 Type **Six-Month Financial Projection** as the new sheet tab name and then press the ENTER key.
- 4 Change the sheet tab color of the Six-Month Financial Projection sheet to Blue, Accent 2 (column 6, row 1) and then select an empty cell (Figure 3–67).

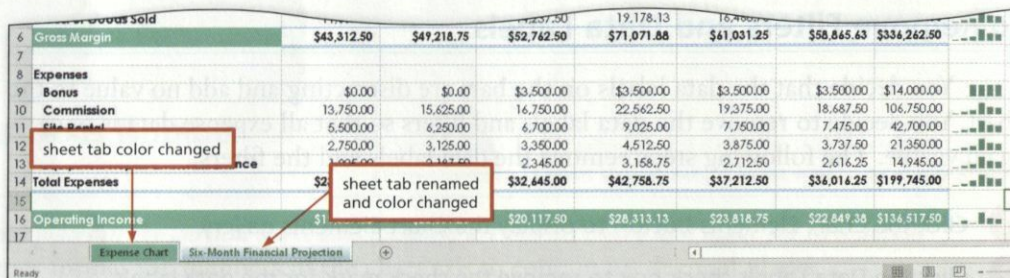


Figure 3–67

To Reorder the Sheet Tabs

Why? You want the most important worksheets to appear first in a workbook, so you need to change the order of sheets. The following step reorders the sheets so that the worksheet precedes the chart sheet in the workbook.

- 1 Drag the Six-Month Financial Projection tab to the left so that it precedes the Expense Chart sheet tab to rearrange the sequence of the sheets (Figure 3–68).

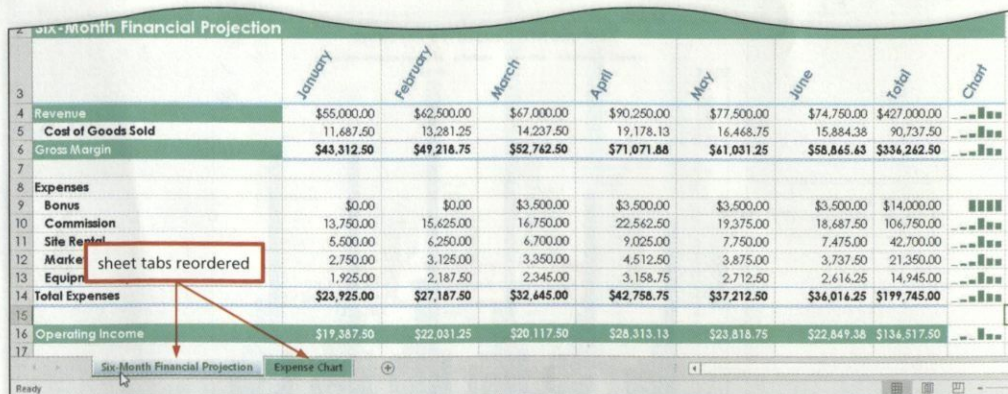


Figure 3–68

Other Ways

1. To move sheet, right-click sheet tab, click Move or Copy on shortcut menu, click OK button

To Check Spelling in Multiple Sheets

By default, the spelling checker reviews spelling only in the selected sheets. It will check all the cells in the selected sheets, unless you select a range of two or more cells. Before checking the spelling, the following steps select both worksheets in the workbook so that both are checked for any spelling errors.

- 1 With the Six-Month Financial Projection sheet active, press CTRL+HOME to select cell A1. Hold down the CTRL key and then click the Expense Chart tab to select both sheets.
- 2 Display the Review tab and then click the Spelling button (Review tab | Proofing group) to check spelling in the selected sheets.
- 3 Correct any errors and then click the OK button (Spelling dialog box or Microsoft Excel dialog box) when the spelling checker is finished.

BTW

Checking Spelling

Unless you first select a range of cells or an object before starting the spelling checker, Excel checks the entire selected worksheet, including all cell values, cell comments, embedded charts, text boxes, buttons, and headers and footers.

To Preview and Print the Worksheet

After checking the spelling, the next step is to preview and print the worksheets. As with spelling, Excel previews and prints only the selected sheets. In addition, because the worksheet is too wide to print in portrait orientation, the orientation must be changed to landscape. The following steps adjust the orientation and scale, preview the worksheets, and then print the worksheets.

- 1 If both sheets are not selected, hold down the CTRL key and then click the tab of the inactive sheet.
- 2 Click File on the ribbon to open the Backstage view.
- 3 Click the Print tab in the Backstage view to display the Print gallery.
- 4 Click the Portrait Orientation button in the Settings area and then select Landscape Orientation to select the desired orientation.
- 5 Click the No Scaling button in the Settings area and then select 'Fit Sheet on One Page' to cause the worksheets to print on one page.
- 6 Verify that the selected printer will print a hard copy of the document. If necessary, click the printer button to display a list of available printer options and then click the desired printer to change the currently selected printer.
- 7 Click the Print button in the Print gallery to print the worksheet in landscape orientation on the currently selected printer.
- 8 When the printer stops, retrieve the printed worksheets (shown in Figure 3-69a and Figure 3-69b).
- 9 Right-click the Six-Month Financial Projection tab, and then click Ungroup Sheets on the shortcut menu to deselect the Expense Chart tab.
- 10 Save the workbook again on the same storage location with the same file name.

BTW

Distributing a Workbook

Instead of printing and distributing a hard copy of a workbook, you can distribute the workbook electronically. Options include sending the workbook via email; posting it on cloud storage (such as OneDrive) and sharing the file with others; posting it on social media, a blog, or other website; and sharing a link associated with an online location of the workbook. You also can create and share a PDF or XPS image of the workbook, so that users can view the file in Acrobat Reader or XPS Viewer instead of in Excel.

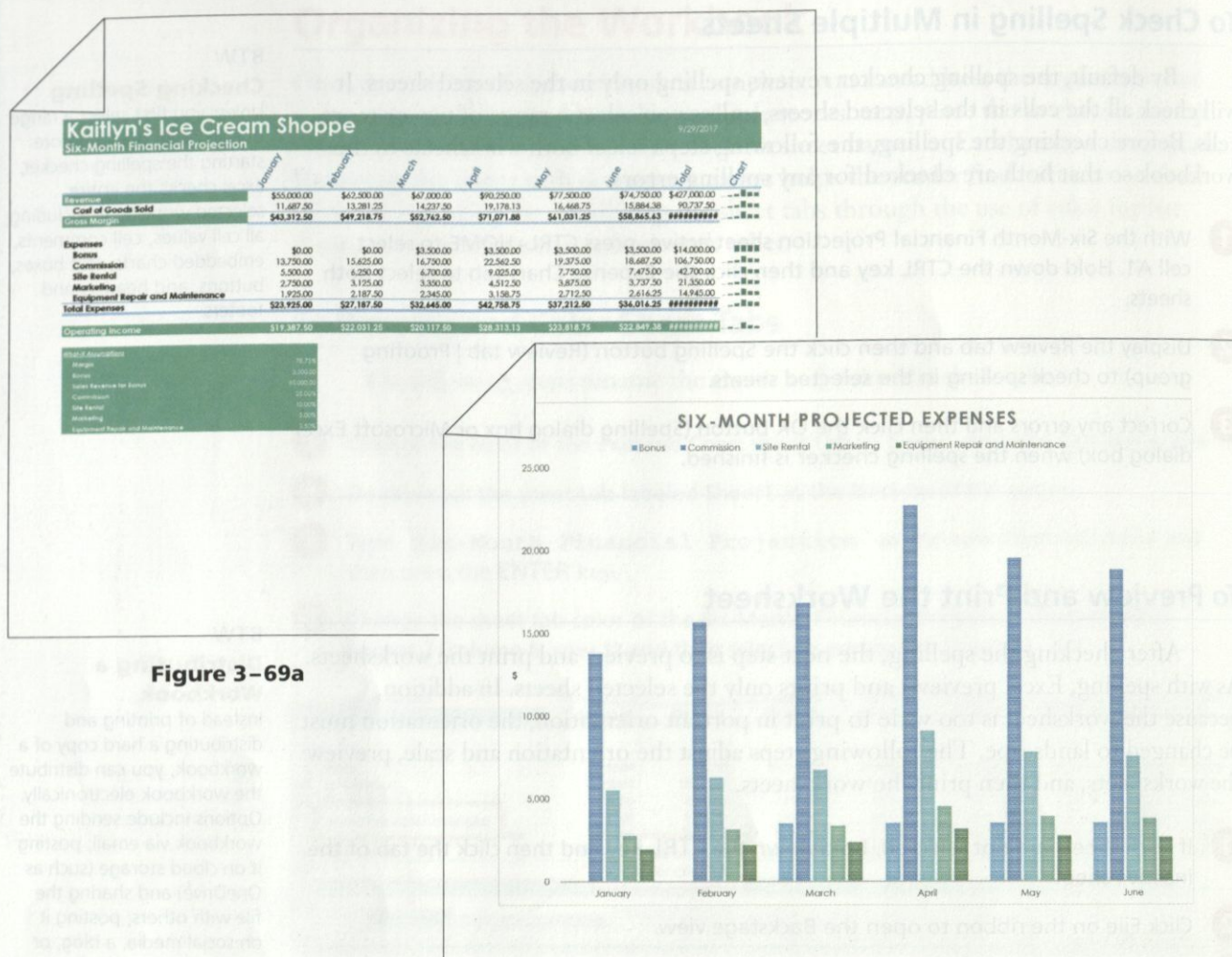


Figure 3-69a

Figure 3-69b

Changing the View of the Worksheet

With Excel, you easily can change the view of the worksheet. For example, you can magnify or shrink the worksheet on the screen. You also can view different parts of the worksheet at the same time by using panes.

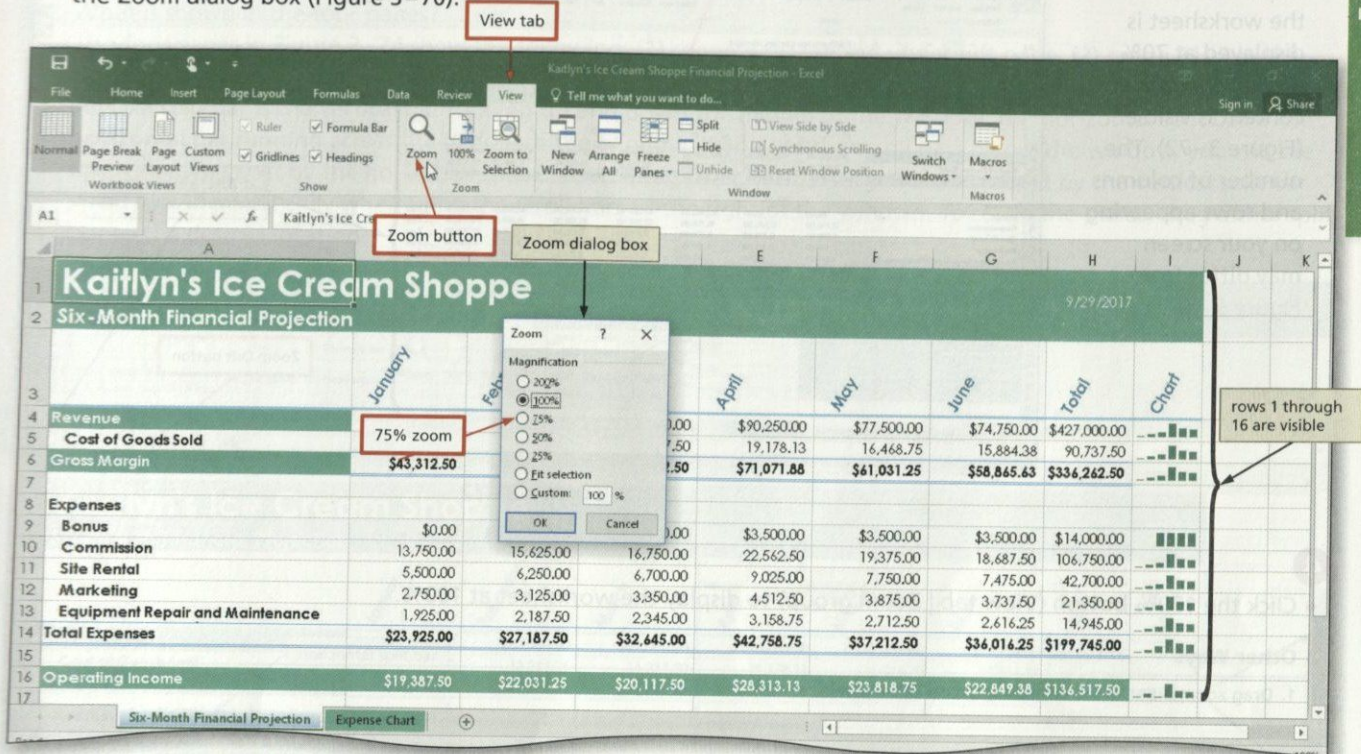
To Shrink and Magnify the View of a Worksheet or Chart

You can magnify (zoom in) or shrink (zoom out) the appearance of a worksheet or chart by using the Zoom button (View tab | Zoom group). *Why? When you magnify a worksheet, Excel enlarges the view of the characters on the screen, but shows fewer columns and rows. Alternatively, when you shrink a worksheet, Excel is able to display more columns and rows.* Magnifying or shrinking a worksheet affects only the view; it does not change the window size or the size of the printout of the worksheet or chart. The following steps shrink and magnify the view of the worksheet.

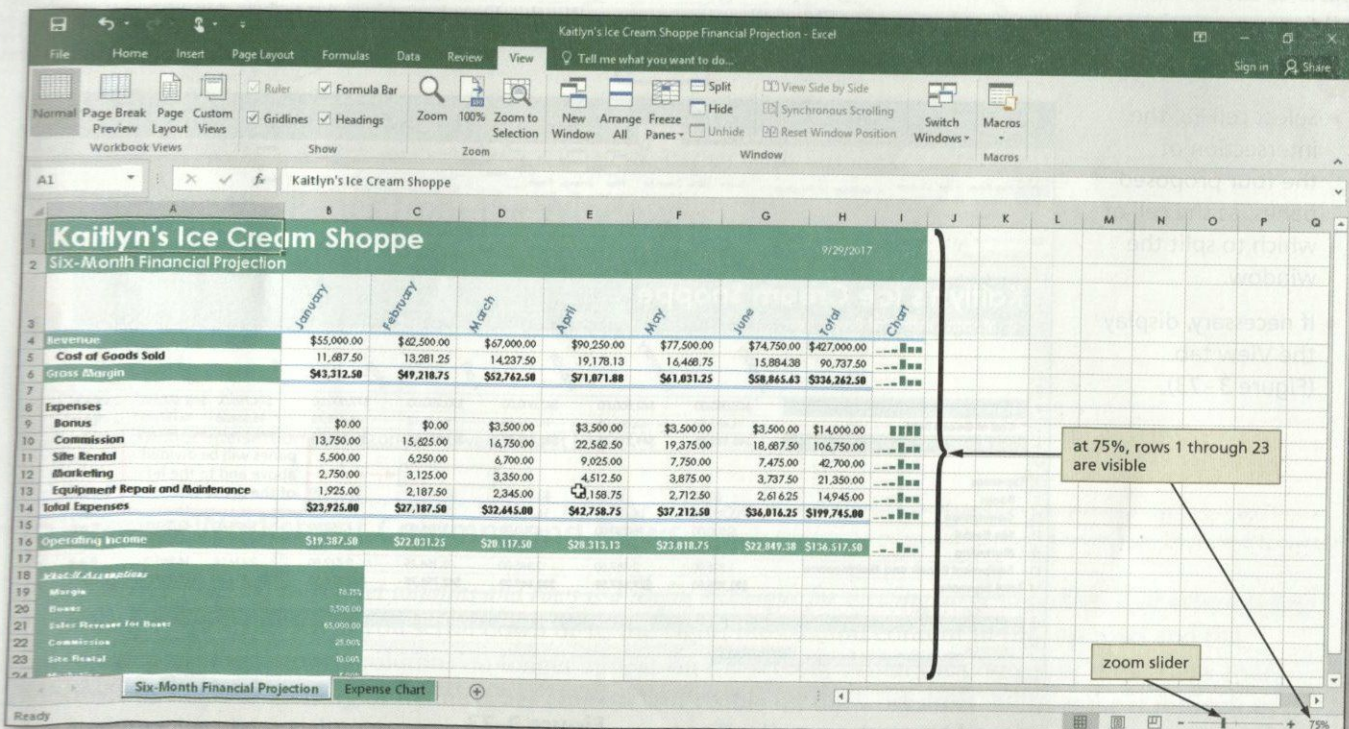
1 ENTER HEADINGS & DATA | 2 ENTER FORMULAS & FUNCTIONS | 3 CREATE SPARKLINE CHARTS
4 FORMAT WORKSHEET | 5 CREATE COLUMN CHART | 6 CHANGE VIEWS | 7 ASK WHAT-IF QUESTIONS

1

- If cell A1 is not active, press CTRL+HOME.
- Display the View tab and then click the Zoom button (View tab | Zoom group) to display a list of magnifications in the Zoom dialog box (Figure 3-70).

**Figure 3-70****2**

- Click 75% and then click the OK button (Zoom dialog box) to shrink the display of the worksheet (Figure 3-71). The number of columns and rows appearing on your screen may differ from Figure 3-71.

**Figure 3-71**

3

- Click the Zoom Out button on the status bar until the worksheet is displayed at 70% and all worksheet content is visible (Figure 3-72). The number of columns and rows appearing on your screen may differ from Figure 3-72.

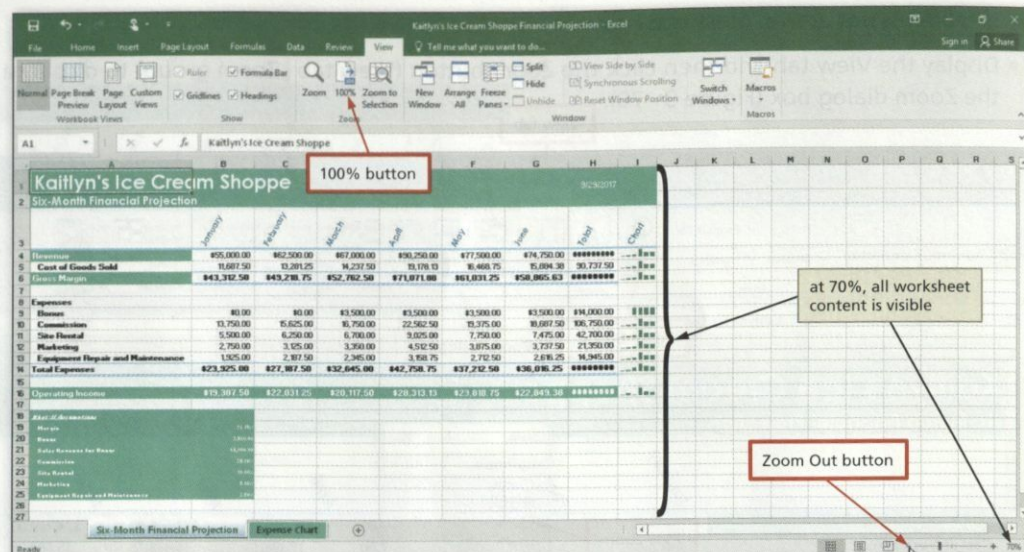


Figure 3-72

4

- Click the 100% button (View tab | Zoom group) to display the worksheet at 100%.

Other Ways

- Drag zoom slider to increase or decrease zoom level

To Split a Window into Panes

When working with a large worksheet, you can split the window into two or four panes to view different parts of the worksheet at the same time. *Why?* Splitting the Excel window into four panes at cell E8 allows you to view all four corners of the worksheet simultaneously. The following steps split the Excel window into four panes.

1

- Select cell E8, the intersection of the four proposed panes, as the cell at which to split the window.
- If necessary, display the View tab (Figure 3-73).

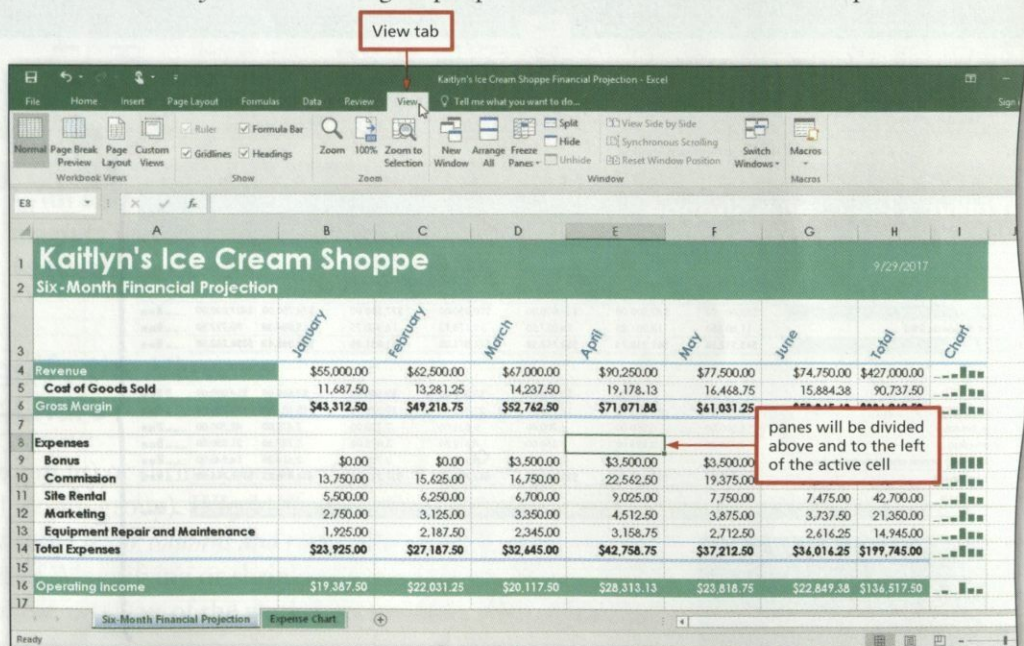


Figure 3-73

2

- Click the Split button (View tab | Window group) to divide the window into four panes.
- Use the scroll arrows to show the four corners of the worksheet at the same time (Figure 3–74).

Q&A

What is shown in the four panes?

The four panes in Figure 3–74 show the following: (1) range A1:D7 in the upper-left pane; (2) range E1:J7 in the upper-right pane; (3) range A17:D25 in the lower-left pane; and (4) range E17:J25 in the lower-right pane. The vertical split bar is the vertical bar running up and down the middle of the window. The horizontal split bar is the horizontal bar running across the middle of the window. If you use the scroll bars below the window, you will see that the panes split by the horizontal split bar scroll together horizontally. The panes split by the vertical split bar scroll together vertically when using the scroll bars to the right of the window. To resize the panes, drag either split bar to the desired location.

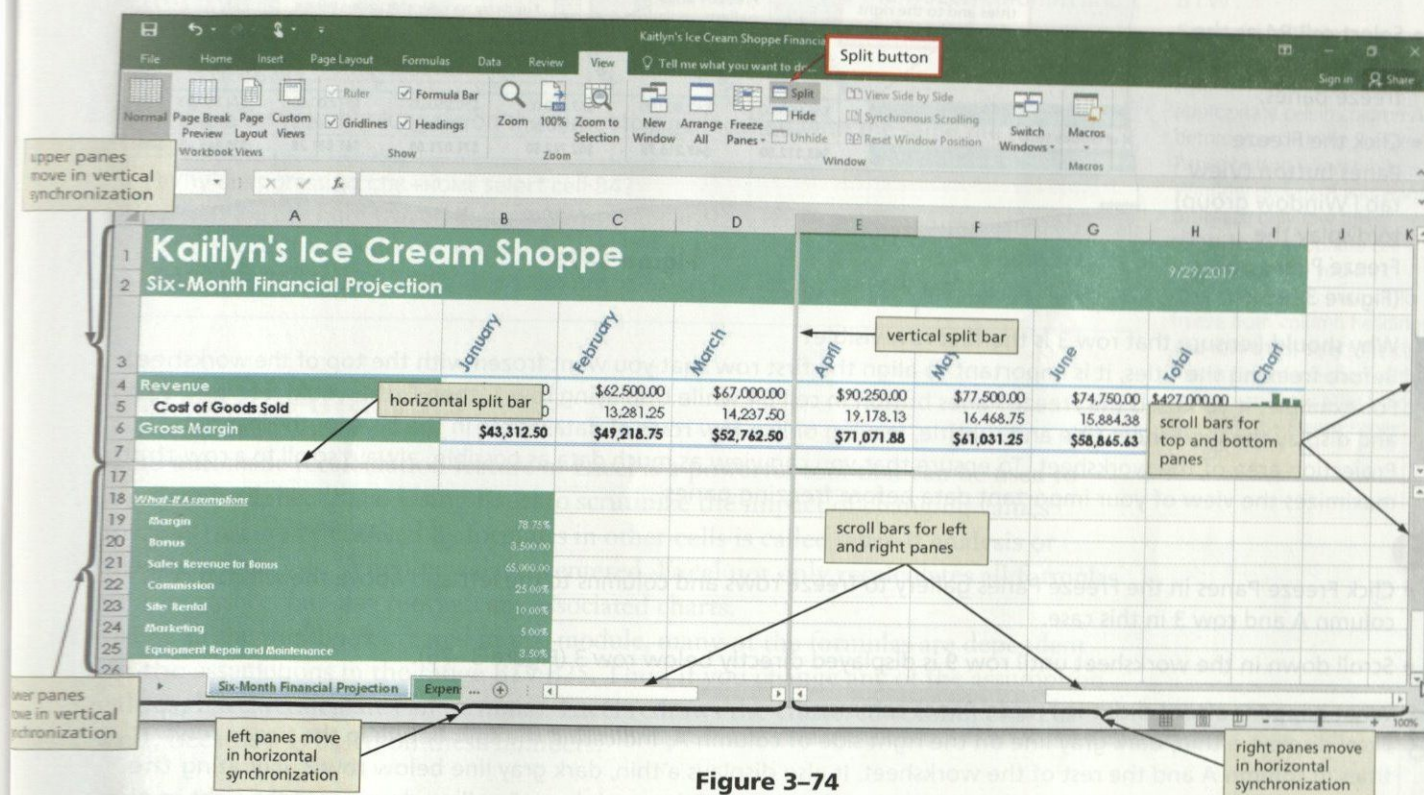


Figure 3–74

To Remove the Panes from the Window

The following step removes the panes from the window.

- Click the Split button (View tab | Window group) to remove the four panes from the window.

Other Ways

- Double-click intersection of horizontal and vertical split bars

To Freeze Worksheet Columns and Rows

Why? Freezing worksheet columns and rows is a useful technique for viewing large worksheets that extend beyond the window. Normally, when you scroll down or to the right, the column content in the top rows and the row content in the leftmost columns no longer appear on the screen. When the content of these rows and/or columns helps to identify or define other content still visible on the worksheet, it can make it difficult to remember what the numbers in the visible cells represent. To alleviate this problem, Excel allows you to freeze columns and rows, so that their content, typically column or row titles, remains on the screen, no matter how

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far down or to the right you scroll. You also may wish to keep numbers visible that you need to see when making changes to content in another part of the worksheet, such as the revenue, cost of goods sold, and gross margin information in rows 4 through 6. The following steps use the Freeze Panes button (View tab | Window group) to freeze the worksheet title and column titles in row 3, and the row titles in column A.

- 1
 - Scroll the worksheet until Excel displays row 3 as the first row and column A as the first column on the screen.
 - Select cell B4 as the cell on which to freeze panes.
 - Click the Freeze Panes button (View tab | Window group) to display the Freeze Panes gallery (Figure 3–75).

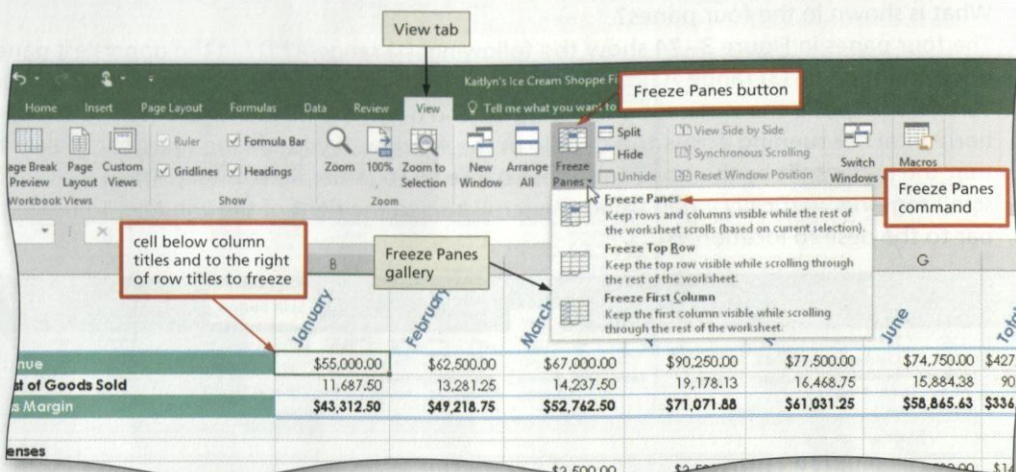


Figure 3–75

Q&A Why should I ensure that row 3 is the first row visible?

Before freezing the titles, it is important to align the first row that you want frozen with the top of the worksheet. For example, if you used the Freeze Panes button in cell B4 while displaying row 1, then Excel would freeze and display the worksheet title and subtitle, leaving only a few rows of data visible in the Six-Month Financial Projection area of the worksheet. To ensure that you can view as much data as possible, always scroll to a row that maximizes the view of your important data before freezing panes.

- 2
 - Click Freeze Panes in the Freeze Panes gallery to freeze rows and columns to the left and above the selected cell, column A and row 3 in this case.
 - Scroll down in the worksheet until row 9 is displayed directly below row 3 (Figure 3–76).

Q&A What happens after I click the Freeze Panes command?

Excel displays a thin, dark gray line on the right side of column A, indicating the split between the frozen row titles in column A and the rest of the worksheet. It also displays a thin, dark gray line below row 3, indicating the split between the frozen column titles in row 3 and the rest of the worksheet. Scrolling down or to the right in the worksheet will not scroll the content of row 3 or column A off the screen (Figure 3–76).

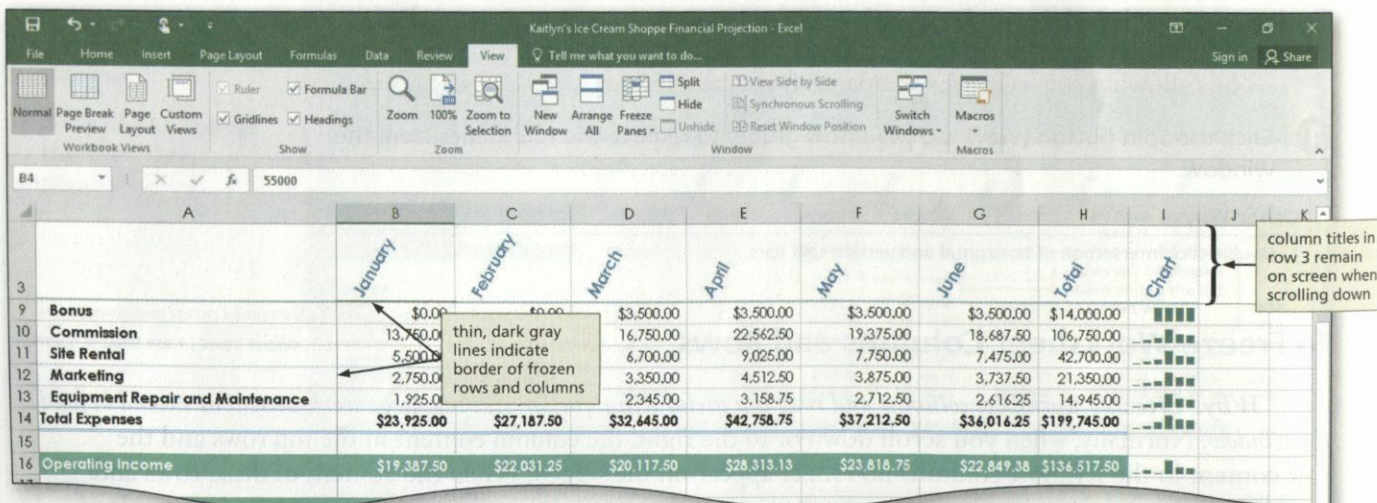


Figure 3–76

To Unfreeze the Worksheet Columns and Rows

Why? Keep columns and rows frozen only as long as you need to view the worksheet in that configuration. The following steps unfreeze the titles in column A and row 3 to allow you to work with the worksheet without frozen rows and columns, or to freeze the worksheet at a different location.

- 1 Press CTRL+HOME to select cell B4 and view the upper-left corner of the screen.
- 2 Click the Freeze Panes button (View tab | Window group) to display the Freeze Panes gallery.
- 3 Click Unfreeze Panes in the Freeze Panes gallery to unfreeze the frozen columns and rows.
- 4 Display the Home tab.
- 5 Save the workbook again on the same storage location with the same file name.

Q&A Why does pressing CTRL+HOME select cell B4?
When the titles are frozen and you press CTRL+HOME, Excel selects the upper-leftmost cell of the unfrozen section of the worksheet. For example, in Step 1 of the previous steps, Excel selected cell B4. When the titles are unfrozen, pressing CTRL+HOME selects cell A1.

BTW

Freezing Titles

If you want to freeze only column headings, select the appropriate cell in column A before you click the Freeze Panes button (View tab | Window group). If you want to freeze only row titles, select the appropriate cell in row 1 before you click the Freeze Panes button. To freeze both column headings and row titles, select the cell that is the intersection of the column and row titles before you click the Freeze Panes button.

What-If Analysis

The automatic recalculation feature of Excel is a powerful tool that can be used to analyze worksheet data. Using Excel to scrutinize the impact of changing values in cells that are referenced by formulas in other cells is called **what-if analysis** or sensitivity analysis. When new data is entered, Excel not only recalculates all formulas in a worksheet but also redraws any associated charts.

In the workbook created in this module, many of the formulas are dependent on the assumptions in the range B19:B25. Thus, if you change any of the assumption values, Excel recalculates all formulas. Excel redraws the clustered column chart as well, because it is based on these numbers.

To Analyze Data in a Worksheet by Changing Values

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Why? The effect of changing one or more values in the What-If Assumptions table — essentially posing what-if questions — allows you to review the results of different scenarios. In this case, you are going to examine what would happen to the six-month operating income (cell H16) if the following changes were made in the What-If Assumptions table: Bonus \$3,500.00 to \$5,000.00; Commission 25.00% to 22.50%; Equipment Repair and Maintenance 3.50% to 4.00%. To answer a question like this, you need to change only the second, fourth, and seventh values in the What-If Assumptions table. The following step splits the screen, which allows you to view income and expense figures simultaneously, and then changes values in the worksheet to answer a what-if question. When a new value is entered, Excel recalculates the formulas in the worksheet and redraws the clustered column chart to reflect the new data.

1

- Scroll the worksheet so that row 4 is the first row visible on the worksheet.
- Click in cell A7 to select the row above which to split the window.
- Click the Split button (View tab | Window group) to split the window after row 6.
- Use the scroll arrows in the lower-right pane to scroll the window content until row 9 is the first row visible in the lower part of the screen, as shown in Figure 3–77.
- Enter 5,000 in cell B20, 22.50% in cell B22, and 4.00% in cell B25 (Figure 3–77), which causes the six-month operating income in cell H16 to increase from \$136,517.50 to \$139,057.50.
- Save the workbook again on the same storage location with the same file name.

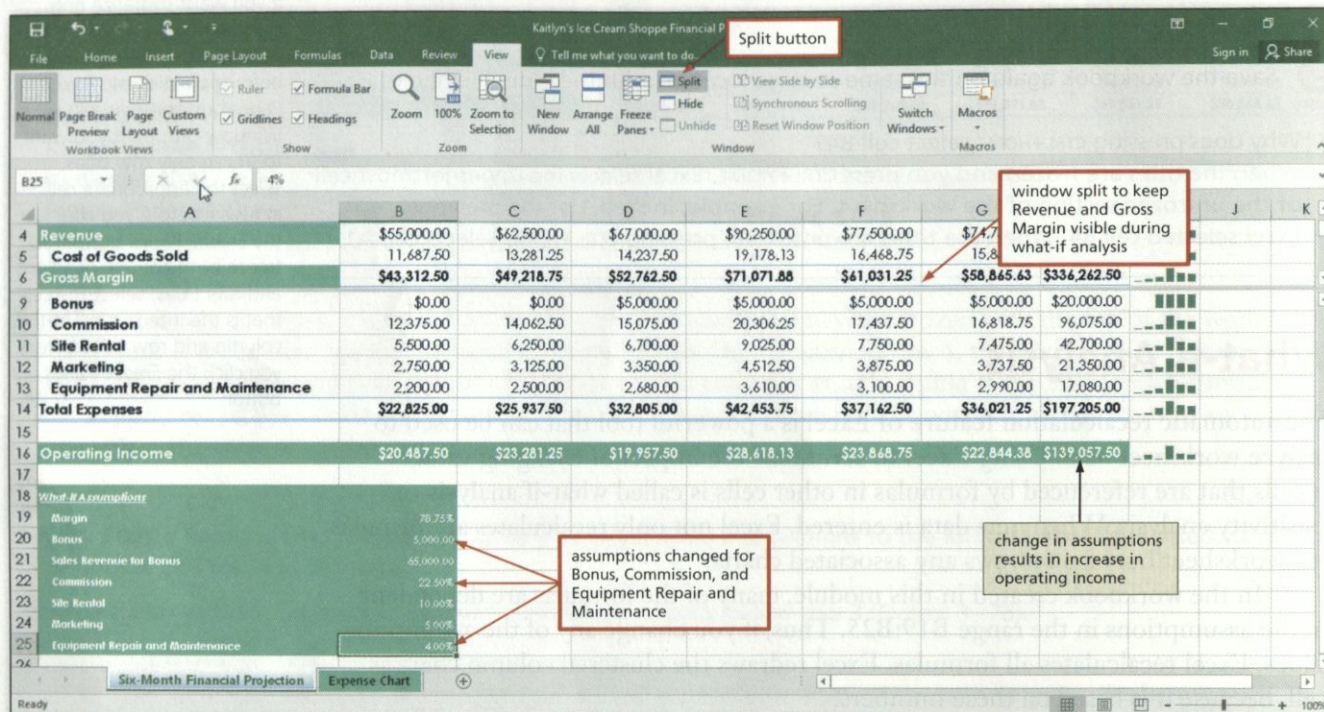


Figure 3–77

To Goal Seek

Why? If you know the result you want a formula to produce, you can use goal seeking to determine the value of a cell on which the formula depends. The previous step, which made changes to the What-If Assumptions table, resulted in an operating income that approaches but does not reach \$145,000.00. The following steps use the Goal Seek command (Data tab | Forecast group) to determine what Site Rental percentage (cell B23), in conjunction with the earlier changes in assumptions, will yield a six-month operating income of \$145,000 in cell H16, rather than the \$139,057.50 calculated in the previous set of steps.

1

- If necessary, use the scroll arrows in the lower pane to ensure that you can view all of the What-If Assumptions table and the Operating Income figures.
- Select cell H16, the cell that contains the six-month operating income.
- Display the Data tab and then click the 'What-If Analysis' button (Data tab | Forecast group) to display the What-If Analysis menu (Figure 3-78).

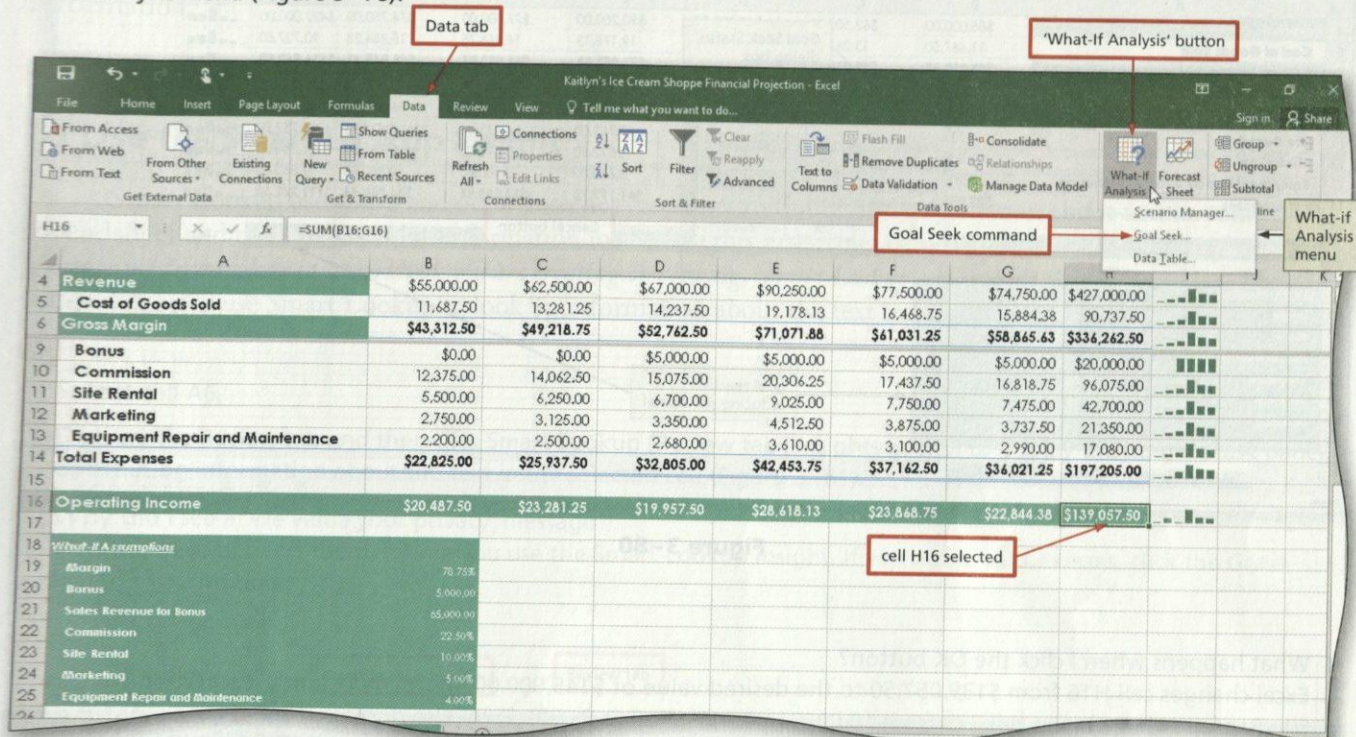


Figure 3-78

2

- Click Goal Seek to display the Goal Seek dialog box with the Set cell box set to the selected cell, H16 in this case.
- Click the To value text box, type **145,000** and then click the 'By changing cell' box to select the 'By changing cell' box.
- Click cell B23 on the worksheet to assign the current cell, B23 in this case, to the 'By changing cell' box (Figure 3-79).

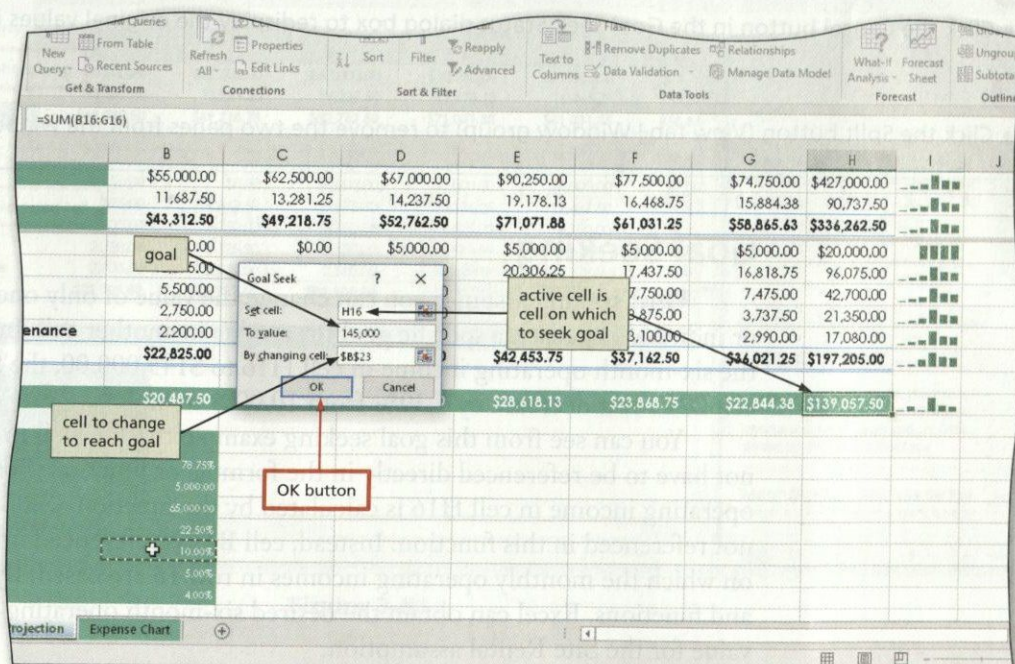


Figure 3-79

3

- Click the OK button (Goal Seek Status dialog box) to goal seek for the sought-after value in the To value text box, \$145,000.00 in cell H16 in this case (Figure 3–80).

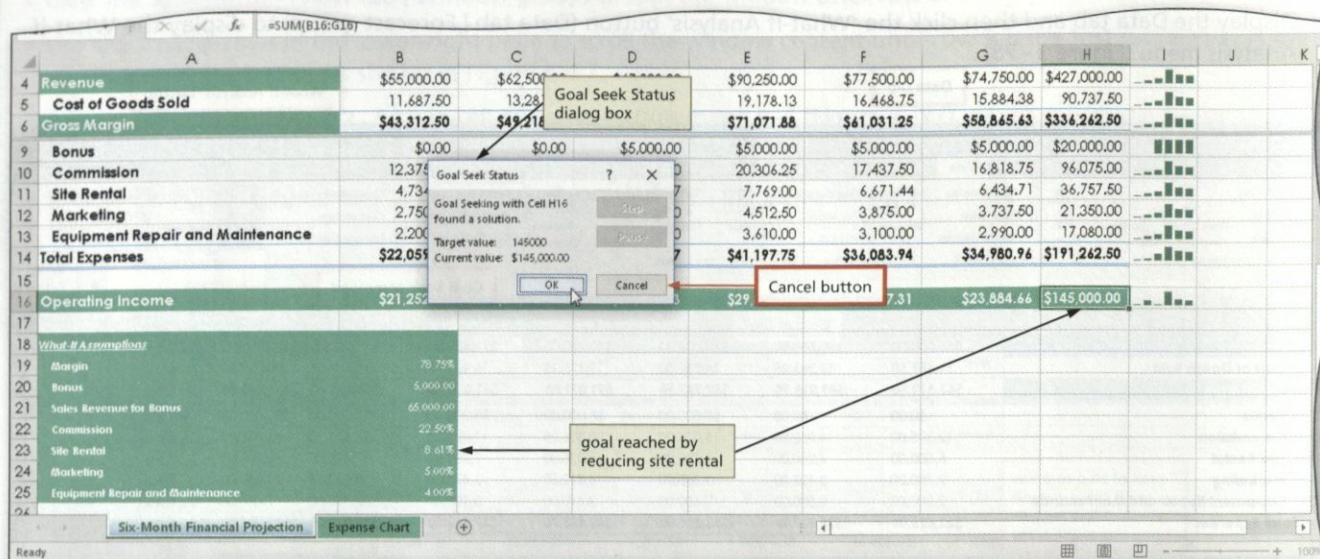


Figure 3–80

Q&A What happens when I click the OK button?

Excel changes cell H16 from \$139,057.50 to the desired value of \$145,000.00. More importantly, Excel changes the Site Rental assumption in cell B23 from 10.00% to 8.61% (Figure 3–80). Excel also displays the Goal Seek Status dialog box. If you click the OK button, Excel keeps the new values in the worksheet. If you click the Cancel button, Excel redisplay the original values.

4

- Click the Cancel button in the Goal Seek Status dialog box to redisplay the original values in the worksheet.

5

- Click the Split button (View tab | Window group) to remove the two panes from the window.

Goal Seeking

Goal seeking assumes you can change the value of only one cell referenced directly or indirectly to reach a specific goal for a value in another cell. In this example, to change the six-month operating income in cell H16 to \$145,000.00, the Site Rental percentage in cell B23 must decrease by 1.39% from 10.00% to 8.61%.

You can see from this goal seeking example that the cell to change (cell B23) does not have to be referenced directly in the formula or function. For example, the six-month operating income in cell H16 is calculated by the function =SUM(B16:G16). Cell B23 is not referenced in this function. Instead, cell B23 is referenced in the formulas in row 11, on which the monthly operating incomes in row 16 are based. By tracing the formulas and functions, Excel can obtain the desired six-month operating income by varying the value for the Site Rental assumption.

Insights

The Insights feature in Excel uses the Bing search engine and other Internet resources to help you locate more information about the content in your workbooks. One common use of this feature is to look up the definition of a word. When looking up a definition, Excel uses contextual data so that it can return the most relevant information.

To Use the Smart Lookup Insight

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Smart Lookup uses Bing and other Internet resources to find useful information about text in your spreadsheet and then displays that information in the Insights task pane. *Why? If you need additional information about some terminology in a workbook you are creating or viewing, Smart Lookup can provide that information.* The following steps use Smart Lookup to look up information about the text in cell A6.

1

- Select cell A6.
- Display the Review tab and then click Smart Lookup (Review tab | Insights group) to display the Insights task pane containing information about the text in the selected cell (Figure 3–81).

Q&A Why did I see a 'We value your privacy' message?

This message appears the first time you use the Smart Lookup insight. If you agree to the terms, click the Got it button to continue.

The screenshot shows the Excel interface with the Review tab selected. The Smart Lookup button is highlighted in the Insights group. The Insights task pane is open on the right, displaying information about 'Gross margin'. The spreadsheet data is as follows:

	B	C	D	E	F	G
4 Revenue	\$5,000.00	\$62,500.00	\$67,000.00	\$90,250.00	\$77,500.00	\$74,750.00
5 Cost of Goods Sold	11,687.50	13,281.25	14,237.50	19,178.13	16,468.75	15,881.25
6 Gross Margin	\$43,312.50	\$49,218.75	\$52,762.50	\$71,071.88	\$61,031.25	\$58,868.75
7						
8 Expenses						
9 Bonus	\$0.00	\$0.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00
10 Commission	875.00	14,062.50	15,075.00	20,306.25	17,437.50	16,812.50
11 Site Rental	6,500.00	6,250.00	6,700.00	9,025.00	7,750.00	7,475.00
12 Marketing	2,750.00	3,125.00	3,350.00	4,612.50	2,875.00	3,712.50
13 Equipment Repair and Maintenance	2,200.00	2,500.00	2,680.00			2,912.50
14 Total Expenses	\$22,825.00	\$25,937.50	\$32,805.00			\$36,012.50
15						
16 Operating Income	\$20,487.50	\$23,281.25	\$19,957.50	\$28,618.13	\$23,868.75	\$22,856.25
17						
18 What-If Assumption						
19 Margin	79.75%					
20 Bonus	5,000.00					
21 Sales Revenue for Bonus	65,000.00					
22 Commission	22.50%					
23 Site Rental	16.00%					
24 Marketing	5.00%					

Figure 3–81

2

- Click the Close button on the Insights task pane to close the task pane.
- If desired, sign out of your Microsoft account.
- Exit Excel.

Accessibility Features

Excel provides a utility that can be used to check a workbook for potential issues related to **accessibility**. Accessibility refers to the practice of removing barriers that may prevent individuals with disabilities from interacting with your data or the app. To use the Check Accessibility command, click File on the ribbon to open the Backstage view, click the Info tab, click the 'Check for Issues' button, and then click Check Accessibility. Excel will check your workbook for content that could prove difficult for people with disabilities to read, either alone or with adaptive tools. The resulting report (Figure 3–82 shows an example) will identify issues and offer suggestions for addressing the reported issues.

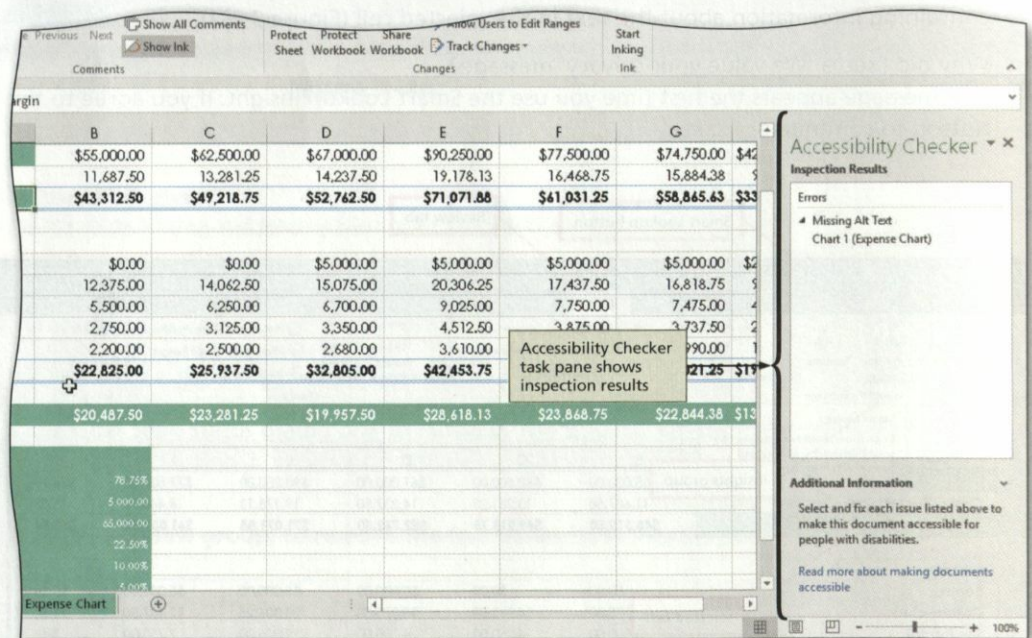


Figure 3–82

Summary

In this module, you learned how to use Excel to create a six-month financial projection workbook. Topics covered included rotating text in a cell, creating a series of month names, entering and formatting the system date, using absolute and mixed cell references, using the IF function, creating and changing sparkline charts, using the format painter, creating a clustered column chart, using chart filters, reordering sheet tabs, changing the worksheet view, freezing and unfreezing rows and columns, answering what-if questions, goal seeking, using Smart Lookup, and understanding accessibility features.



What decisions will you need to make when creating your next worksheet to evaluate and analyze data using what-if analysis?

Use these guidelines as you complete the assignments in this module and create your own worksheets for evaluating and analyzing data outside of this class.

1. Determine the workbook structure.
 - a) Determine the data you will need for your worksheet.
 - b) Determine the layout of your data on the worksheet.
 - c) Determine the layout of the assumptions table on the worksheet.
 - d) Determine the location and features of any charts.
2. Create the worksheet.
 - a) Enter titles, subtitles, and headings.
 - b) Enter data, functions, and formulas.
3. Format the worksheet.
 - a) Format the titles, subtitles, and headings.
 - b) Format the numbers as necessary.
 - c) Format the text.
4. Create and use charts.
 - a) Select data to chart.
 - b) Select a chart type for selected data.
 - c) Format the chart elements.
 - d) Filter charts if necessary to view subsets of data.
5. Perform what-if analyses.
 - a) Adjust values in the assumptions table to review scenarios of interest.
 - b) Use Goal Seek to determine how to adjust a variable value to reach a particular goal or outcome.

