Creating Charts 12

LESSON SKILL MATRIX

Skills	Exam Objective	Objective Number
Building Charts	Create charts and graphs.	5.1.1
Formatting a Chart with a Quick Style or Layout		
Formatting the Parts of a Chart Manually	Add legends.	5.2.1
	Modify chart and graph parameters.	5.2.3
Modifying a Chart	Add additional data series.	5.1.2
	Switch between rows and columns in source data.	5.1.3
	Position charts and graphs.	5.2.5
	Resize charts and graphs.	5.2.2
	Apply chart layout and styles.	5.2.4
Using New Quick Analysis Tools	Insert sparklines.	2.3.2
	Demonstrate how to use Quick Analysis.	5.1.4
Creating PivotTables and PivotCharts		

KEY TERMS

- axis
- chart
- chart area
- chart sheet
- data labels
- data marker
- data series
- embedded chart
- legend
- PivotChart
- PivotTable
- plot area
- sparklines
- title

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Fourth Coffee owns espresso cafes in 15 major markets. Its primary income is generated from the sale of trademarked, freshly brewed coffee, and espresso drinks. The cafes also sell a variety of pastries, packaged coffees and teas, deli-style sandwiches, and coffee-related accessories and gift items. In preparation for an upcoming budget meeting, the corporate manager wants to create charts to show trends in each of the five revenue categories for a five-year period and to project those trends to future sales. Because Excel enables you to track and work with substantial amounts of data, it is sometimes difficult to see the big picture by looking at the details in a worksheet. With Excel's charting capabilities, you can summarize and highlight data, reveal trends, and make comparisons that might not be obvious when looking at the raw data. You will use charts, Quick Analysis tools, PivotTables, and PivotCharts to present the data for Fourth Coffee.

SOFTWARE ORIENTATION

The INSERT Tab

The INSERT tab contains the command groups you'll use to create charts in Excel (see Figure 12-1). To create a basic chart in Excel that you can modify and format later, start by entering the data for the chart on a worksheet. Then, you select that data and choose a chart type to graphically display the data. Simply by choosing a chart type, a chart layout, and a chart style—all of which are within easy reach on the ribbon's INSERT and CHART TOOLS tabs—you will have instant professional results every time you create a chart.

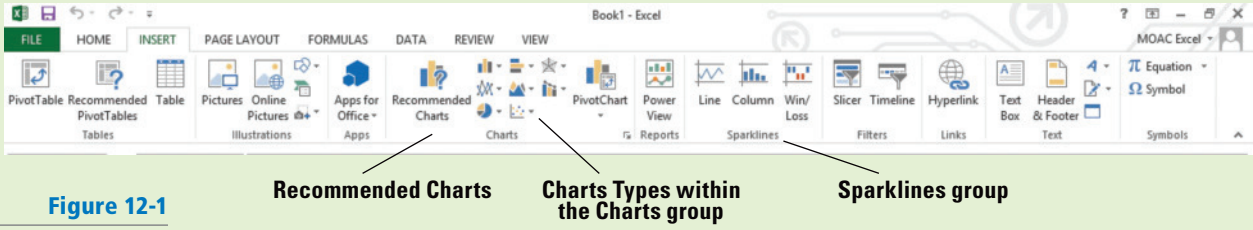


Figure 12-1

INSERT tab

Use this illustration as a reference throughout this lesson as you become familiar with and use Excel's charting capabilities to create attention-getting illustrations that communicate an analysis of your data.

BUILDING CHARTS

Bottom Line

A **chart** is a graphical representation of numeric data in a worksheet. Data values are represented by graphs with combinations of lines, vertical or horizontal rectangles (columns and bars), points, and other shapes. When you want to create a chart or change an existing chart, you can choose from 11 chart types with numerous subtypes and combo charts. Table 12-1 gives a brief description of each Excel chart type.

Table 12-1

Ribbon Buttons and Options

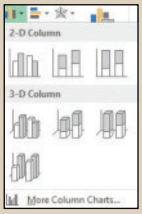
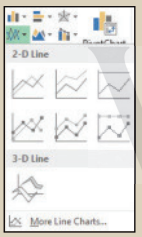
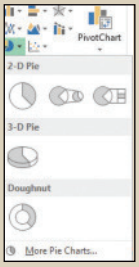
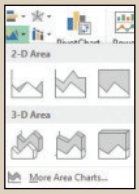
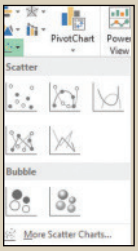
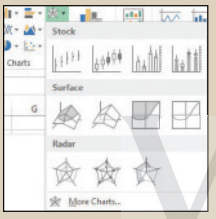
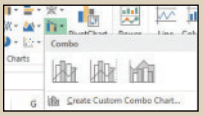
Ribbon Button and Options	Chart Name	Function	Usual Data Arrangement
	Column	Useful for comparing values across categories or a time period. Data points are vertical rectangles.	Categories (in any order) or time are usually on horizontal axis and values are on vertical axis.
	Line	Useful for showing trends in data at equal intervals. Displays continuous data over time set against a common scale. Values are represented as points along a line.	Time in equal units on horizontal axis and values on vertical axis.
	Pie	Useful for comparing the size of items in one data series and how each slice compares with the whole. Data points are displayed as a percentage of a circular pie.	Only one data series and none of the values are negative or are zero.w
	Doughnut	Useful for displaying the relationship of parts to a whole. Can contain more than one data series. Values are represented as sections of a circular band.	Categories are colors of circular bands and the size of the bands are the values of each band.
	Bar	Useful for illustrating comparisons among individual items when axis labels are long. Values are represented as horizontal rectangles.	Categories or time are along the vertical axis and values are along the horizontal axis.
	Area	Useful for emphasizing magnitude of change over time. It can be used to draw attention to the total value across a trend. Shows relationships of parts to the whole. Values represented as shaded areas.	Categories or time are on the horizontal axis and values are on the vertical axis.

Table 12-1
Ribbon Buttons and Options

Ribbon Button and Options	Chart Name	Function	Usual Data Arrangement
	Scatter	Useful for showing relationships of one numeric set of data against another numeric set of data to see whether there is a correlation between two variables. Values are represented as single data points that are the intersection of a value on one axis against the other value on the other axis.	The independent variable is usually on the horizontal axis and the dependent variable is on the vertical axis.
	Bubble	Useful for comparing three sets of values.	First value is horizontal distance, second value is vertical distance, and third value is the size of bubble.
	Stock	Useful for illustrating the fluctuation of stock prices or scientific data when there is a start, end, high, and low value during each period. There can also be a separate value attached to each time period (such as volume).	For each time period, there are three to five numbers.
	Surface	Useful for finding optimum combinations between two sets of data. The resulting plot looks similar to a topographic map or piece of cloth draped over points.	Both categories and values are numeric values.
	Radar	Useful for showing multiple variables for each subject. Variables are often unrelated but standardized to the same scale. The value of each variable is the distance from a center point. Represents values as points that radiate on spikes from the center.	First column is label of spike. First row is label of units. Values for each unit go down each column starting in the second column after the row labels. The maximum value is the outer edge of chart. The minimum value is in the center of the chart.
	Combo	Two or more chart types such as line and column.	

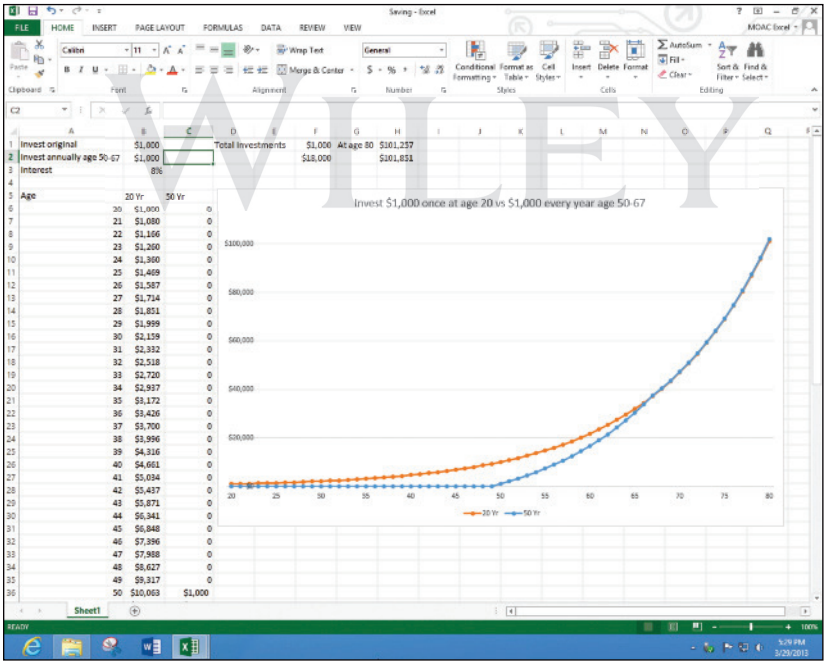
Take Note When building a worksheet for a chart, the time period is normally displayed in the first row and the categories are in the first column. There is a Switch Row/Column button on the DESIGN tab that allows you to change the orientation of the data as it appears in the chart. The fourth column in Table 12-1 assumes the default setup for data in a chart. You should know what your organization's standards are because charts are meant for quickly telling a story and if they are laid out differently than the standards, the charts may defeat their purpose and confuse rather than enlighten your audience.

Workplace Ready

PERSONAL CHARTS

As you see throughout this lesson, in addition to looking good, charts can be tools for communicating a lot of information in an easy-to-read format and they help make decisions. As you go through this chapter, consider the financial decisions you make throughout your life. It might feel impossible to save $1,000 now to put toward the future; however, it might also feel impossible when you have children in college. It's hard to say. To get about $100,000 by the age of 80, you could put $1,000 in a stock market fund (assuming historic rates of return) one time at age 20 or you can put $1,000 a year for 18 years from age 50 to 67).

Try to put your major life financial decisions in workbooks to see the impact of your decisions on your pocketbook. Obviously, you have to make decisions based on many more factors, but at least you will have one objective viewpoint covered.



Selecting Data to Include in a Chart

Excel's ribbon interface makes it simple to create a chart. As you will see in the following exercise, you can create one of the common chart types by clicking its image on the INSERT tab. More important than the chart type, however, is the selection of the data you want to display graphically. What aspects of the data do you want viewers to notice? The answer to that question is a major factor in selecting an appropriate chart type. In this exercise, you will learn to select data for use in an Excel chart that returns your calculations and data in a color-coded pie chart with sections identified by numbers or labels.

There are two approaches to identifying the data for your chart. If you lay out your worksheet efficiently, you can select multiple ranges at one time that will become the different chart elements. The second way is to identify the chart type and then select the data for each chart element. If you create many charts and eventually identify your own chart types, you might benefit by using the former method. If your charts are more complex, you will benefit by using the latter method. The first part of this lesson walks you through choosing the ranges first and the second part of the lesson walks you through adding and removing certain chart elements.

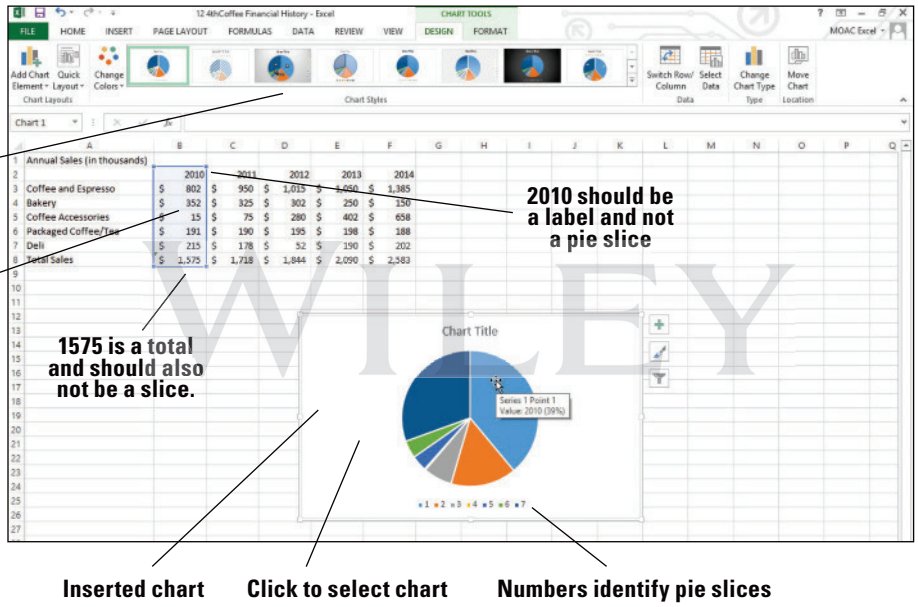
STEP BY STEP Select Data to Include in a Chart

GET READY. LAUNCH Excel.

1. OPEN the ***12 4thCoffee Financial History*** file for this lesson.
2. Select **B2:B8** (the 2010 data).
3. Click the **INSERT** tab, and in the Charts group, click the **Pie** button. Click the **first** 2-D Pie chart. A color-coded pie chart with sections identified by number is displayed.
4. Move the mouse pointer to the largest slice. The ScreenTip shows *Series 1 Point 1 Value: 2010 (39%)*, as shown in Figure 12-2. This corresponds to the label 2010 rather than actual data.

Figure 12-2

Pie chart created with incorrect data



5. Point to the second largest slice and you'll see that the value is 1575, which is the amount for the total. Neither the column label (2010) nor the total sales amount should be included as pie slices.
6. Click in the chart's white space and press **Delete**. The chart is now deleted and the CHART TOOLS tab disappears.

Troubleshooting To delete a chart, click in the white space then press the Delete key on your keyboard. If you click on the graphic or another chart element and press Delete, only the selected element will be deleted.

7. Select **B3:B7**, click the **INSERT** tab, in the Charts group, click **Pie**, and then click the **first** 2-D Pie chart. The correct data is displayed, but the chart is difficult to interpret with only numbers to identify the parts of the pie.

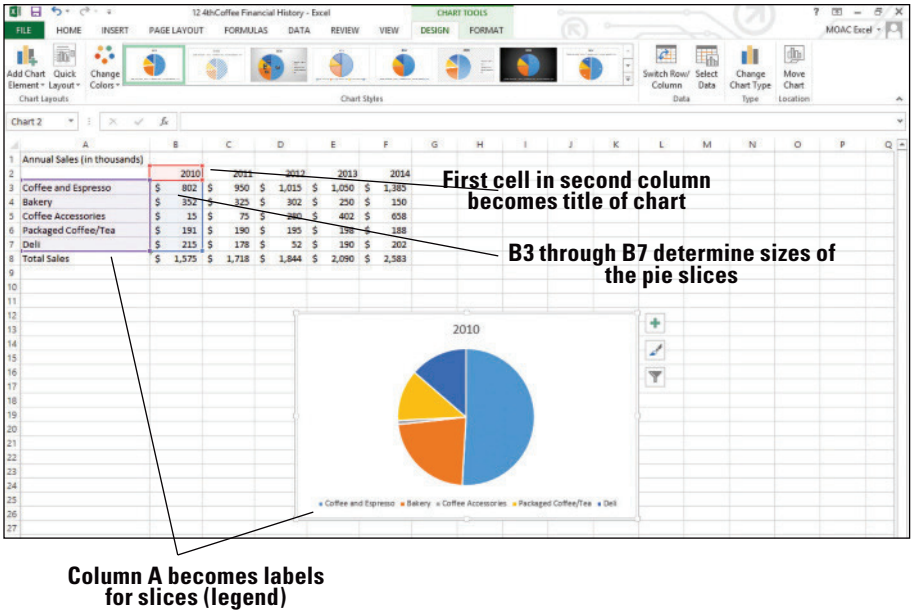
Troubleshooting When you insert a chart into your worksheet, the CHART TOOLS tabs (DESIGN and FORMAT) become available in Excel's ribbon with the DESIGN tab active by default. You must select the INSERT tab on the ribbon each time you want to insert a chart.

8. Click in the chart's white space and press **Delete**.
9. Select **A2:B7**, click the **INSERT** tab, and click **Pie** in the Charts group. Click the **first** 2-D Pie chart. As illustrated in Figure 12-3, the data is clearly identified with a title and a label for each colored slice of the pie.

Cross Ref You will learn later in the lesson how to select the Chart Styles and change the layout to show values for chart elements such as moving the label or adding percents next to the pie slices.

Figure 12-3

Formatted pie chart



CERTIFICATION READY? 5.1.1

How do you select appropriate data sources for charts?

10. Move the mouse pointer to a blank spot within the chart and drag the chart to move it below the data.

Troubleshooting Just like deleting an element, if you drag a chart element, the mouse will move the element within the chart.

11. Click outside of the chart, click **FILE,** and then click **Print**. Notice that the Annual Sales data appears with the chart on the page.
12. Press **Esc** and click on the **Chart** and choose **FILE**, **Print**. Now notice that the chart appears by itself.

Take Note If you want to print just an embedded chart on a workbook, select the chart before you choose FILE, Print.

13. CREATE a Lesson 12 folder and SAVE the workbook as ***12 Charts Solution***.

PAUSE. LEAVE the workbook open for the next exercise.

This exercise illustrates that the chart's data selection must contain sufficient information to interpret the data at a glance. Excel did not distinguish between the column B label and its data when you selected only the data in column B. Although the label is formatted as text, because the column label was numeric, it was interpreted as data to be included in the graph. When you expanded the selection to include the row labels, 2010 was correctly recognized as a label and displayed as the title for the pie chart.

When you select data and create a pie chart, the chart is placed on the worksheet. This is referred to as an **embedded chart**, meaning it is placed on the worksheet rather than on a separate **chart sheet**, a sheet that contains only a chart.

Moving a Chart

When you insert a chart, by default it is embedded in the worksheet. You can click a corner of a chart or the midpoint of any side to display sizing handles (two-sided vertical, horizontal, or diagonal white arrows). You can use the sizing handles to change the size of a chart. To move the chart, you need to click and drag the four-headed black mouse pointer in the white space. You might want a chart to be reviewed with the worksheet data or you might want the chart to stand on its own. In this exercise, you move a chart to a new sheet in the workbook.

STEP BY STEP Move a Chart

CERTIFICATION READY? 5.2.5

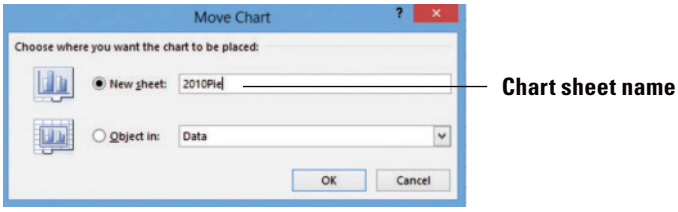
How do you place a chart on a separate sheet?

GET READY. USE the workbook from the previous exercise.

1. Click in the white space on the chart to select it.
2. On the **DESIGN** tab, click the **Move Chart** button.
3. In the Move Chart dialog box, click in the **New** sheet box and type **2010Pie** to create the name of your new chart sheet (see Figure 12-4).

Figure 12-4

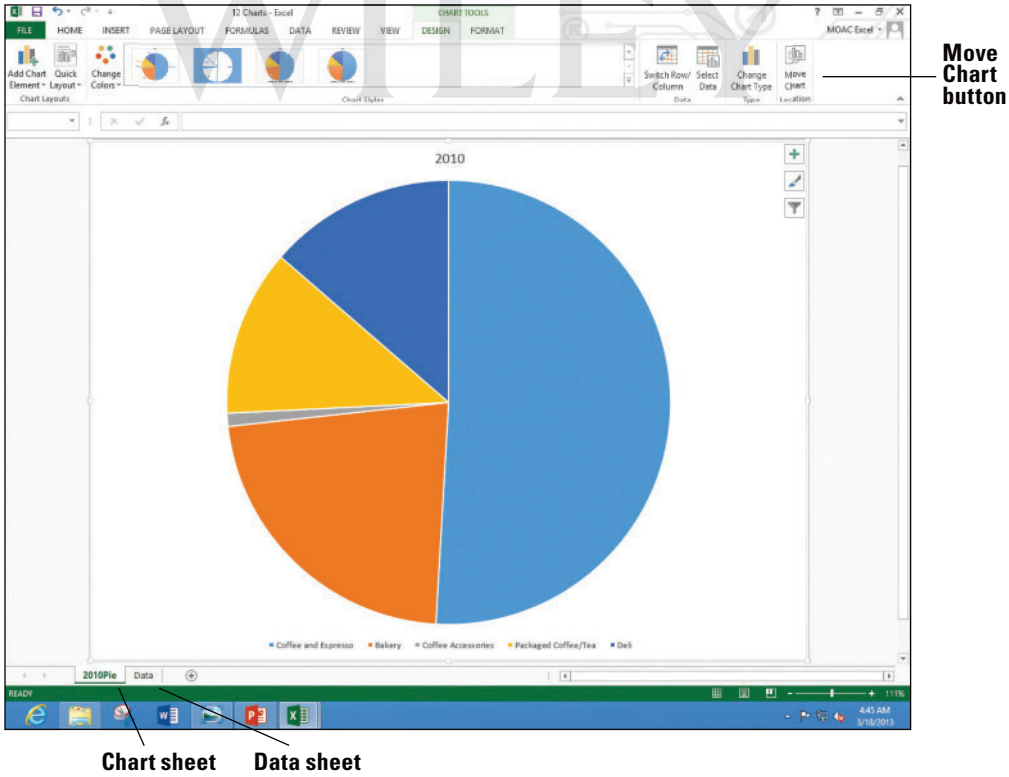
Move Chart dialog box



4. Click **OK**. The chart becomes a separate sheet in the workbook (see Figure 12-5).

Figure 12-5

Chart sheet created



5. Click on the **Data** worksheet tab to return to the data portion of the workbook.
6. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

If you want to return the chart to the Data sheet, you could go to the 2010Pie tab, click the Move Chart button again, and in the Object in box, select Data (the name of the sheet). Refer back to Figure 12-4.

Choosing the Right Chart for Your Data

You can create most charts, such as column and bar charts, from data that you have arranged in rows or columns in a worksheet. Some charts, such as pie and bubble charts, require a specific data arrangement. A single pie chart cannot be used for comparisons across periods of time or for analyzing trends. The column chart works well for comparisons. In a 2-D or 3-D column chart, each data marker is represented by a column. In a stacked column, data markers are stacked so that the top of the column is the total of the same category (or time) from each data series. A line chart shows points connected by a line for each value. The line chart emphasizes the trend or change over time and the column chart highlights differences between categories. In this exercise, you learn how to create a column chart and a line chart to illustrate the increase in coffee and espresso sales at Fourth Coffee during a five-year period.

STEP BY STEP — Choose the Right Chart for Your Data

GET READY. USE the workbook from the previous exercise.

1. Select cells **A2:F7**.

Troubleshooting

Make sure you do not include row 8, the Total Sales row. Otherwise, the last column in each year will be huge and dwarf the other columns. It is standard practice not to include totals in column and bar charts. In some instances it may be helpful to add a line with the totals as a separate axis on the right.

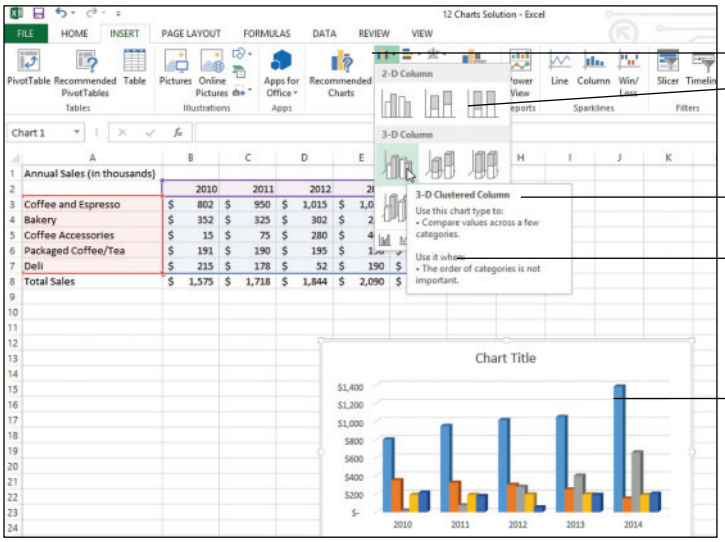
CERTIFICATION READY? 5.1.1

How do you pick the chart type for your chart?

2. Click the **INSERT** tab, and in the Charts group, click **Column**. In the Column drop-down list, move to each of the options. When you pause on an option, Excel shows a preview of the chart on the worksheet and a description and tips for the selected chart type. Under 3-D Column, move to the first option. As shown in Figure 12-6, the ScreenTip shows that the type of chart is a 3-D Clustered Column and it is suggested to compare values when the order of categories is not important.

Figure 12-6

ScreenTip and chart preview



CERTIFICATION READY? 5.1.1

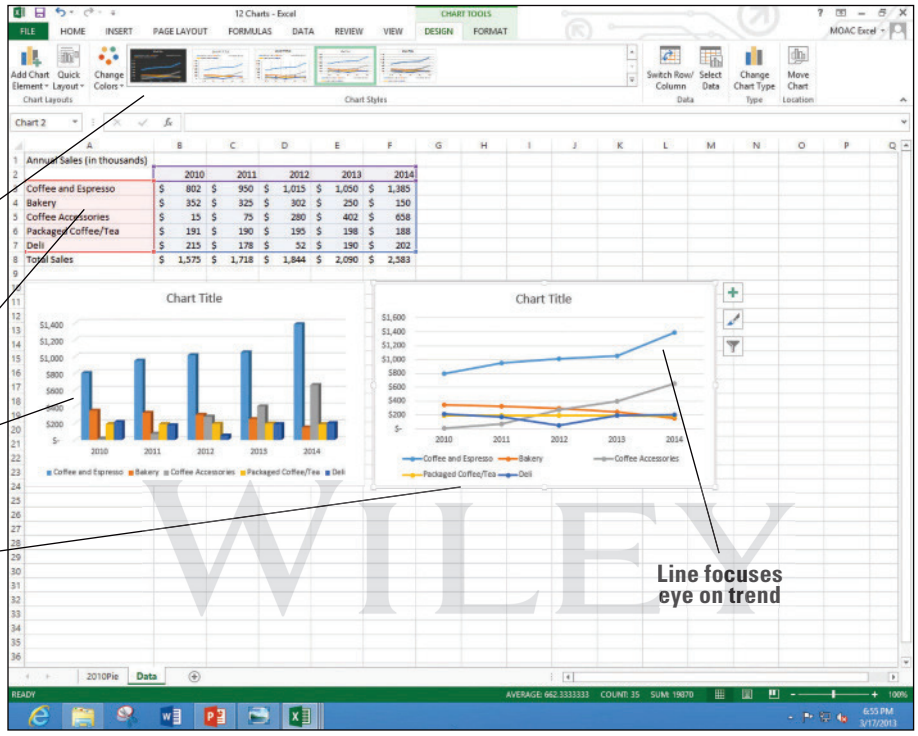
How do you select appropriate chart types to represent data sources?

3. In the drop-down list, click **3-D Clustered Column**. The column chart illustrates the sales for each of the revenue categories for the five-year period. The CHART TOOLS tab appears with the DESIGN tab active.
4. Anywhere in a blank area on the chart, click and drag the chart below the worksheet data and position it at the far left.
5. Click outside the column chart to deselect it. Notice that the CHART TOOLS tab disappears.

6. Select **A2:F7**, click the **INSERT** tab, and in the Charts group, click **Line**. In the 2-D Line group, click the **Line with Markers** option (first chart in the second row). Position the line chart next to the column chart. Note that the CHART TOOLS tab is on the ribbon with the DESIGN tab active. Refer to Figure 12-7.

Figure 12-7

Column chart and line chart



Take Note Take a minute to study the two charts. In the column chart, Coffee and Espresso are by far the largest revenue sources, but Coffee Accessories are catching up. On the line chart, notice that Coffee and Espresso increase over time, but that Coffee Accessories increases faster. Bakery items are decreasing, and the Deli sales is a bit up and down.

Another Way

You can also right-click on a chart and select Move Chart.

7. Click the column chart and click the **DESIGN** tab.
8. Click the **Move Chart** button and in the New sheet box, type **Column**, and then click **OK**.
9. Click the **Data** worksheet tab, select the **line** chart, click the **Move Chart** button, and in the New sheet box, type **Line**, and then click **OK**.
10. SAVE the workbook.

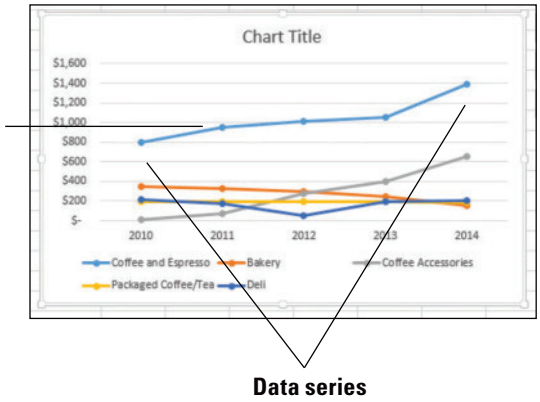
PAUSE. LEAVE the workbook open for the next exercise.

The column and line charts provide two views of the same data, illustrating that the chart type you choose depends on the analysis you want the chart to portray. The pie chart, which shows values as part of the whole, displays the distribution of sales for one year. Column charts also facilitate comparisons among items but also over time periods. A line chart's strength is showing trends over time.

The line chart you created in this exercise is shown in Figure 12-8. The chart includes data markers to indicate each year's sales. A **data marker** is a bar, area, dot, slice, or other symbol in a chart that represents a single data point or value that originates from a worksheet cell. Related data markers in a chart constitute a **data series**.

Figure 12-8

Line chart with data markers



Using Recommended Charts

If you are new to charting, it can be overwhelming with up to 11 options on each of the 8 chart buttons, not to mention the more chart type choices on each button. Excel 2013 has a new feature to help narrow the choices depending on the data that you select. It is the Recommended Charts button. In this exercise, you will select different sets of data and observe what choices Recommended Charts displays.

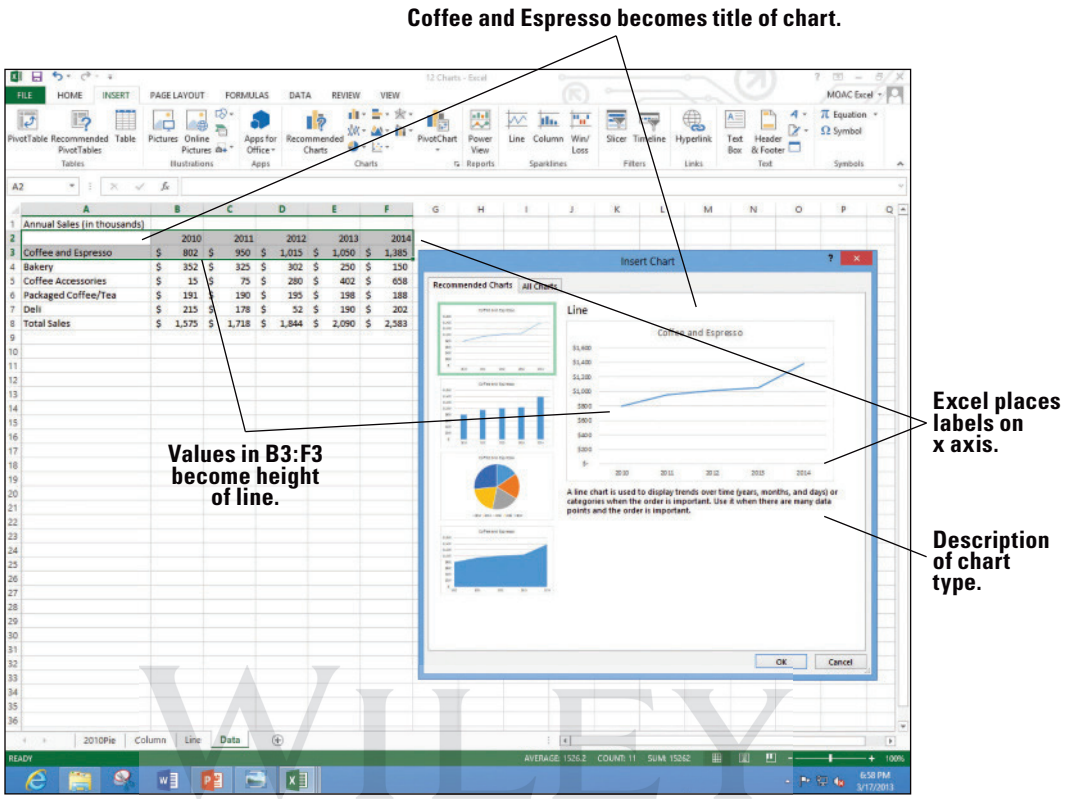
STEP BY STEP Use Recommended Charts

GET READY. USE the workbook from the previous exercise.

1. Click the **Data** worksheet tab.
2. Select the **Year** labels and Coffee and Espresso cells **A2:F3**, click the **INSERT** tab, and then click the **Recommended Charts** button. Notice that Excel recommends four chart types (see Figure 12-9). Excel explains when you use each of the charts underneath the example.

Figure 12-9

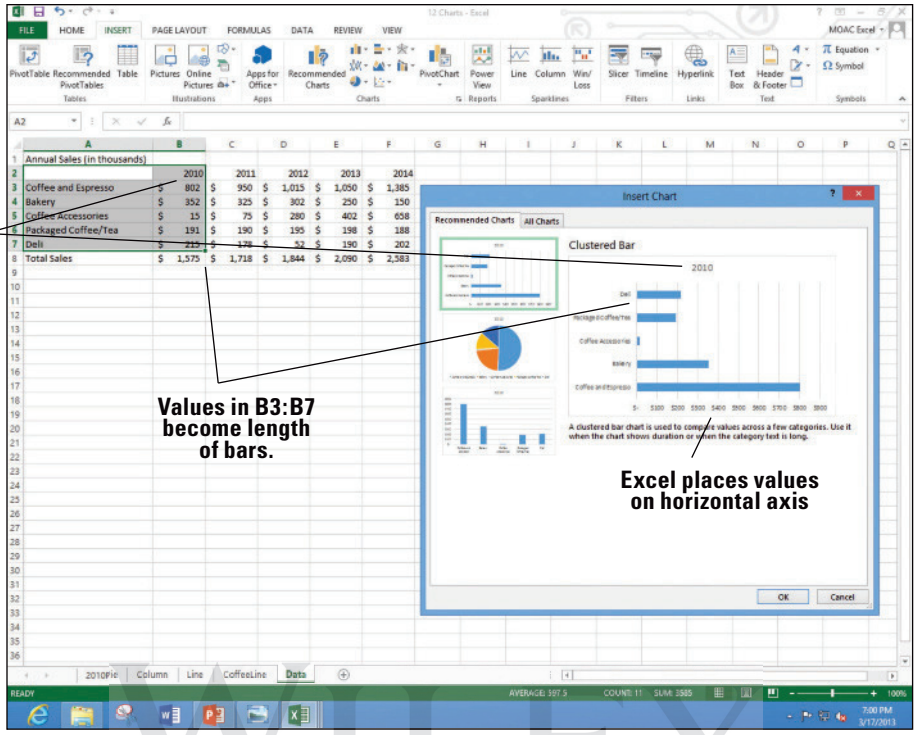
Recommended charts for two rows of data (labels and values)



3. Click the other three chart types and read each description. Click the **Line** chart, and then click **OK**.
4. Click the **Move Chart** button, and in the New sheet box, type **CoffeeLine**, and then click **OK**.
5. Click the **Data** worksheet tab, select cells **A2:B7** to include the labels and data for 2010, and then on the INSERT tab, click the **Recommended Charts** button. Notice the three chart types recommended this time (see Figure 12-10).

Figure 12-10

Recommended charts for text in one column and values in next column

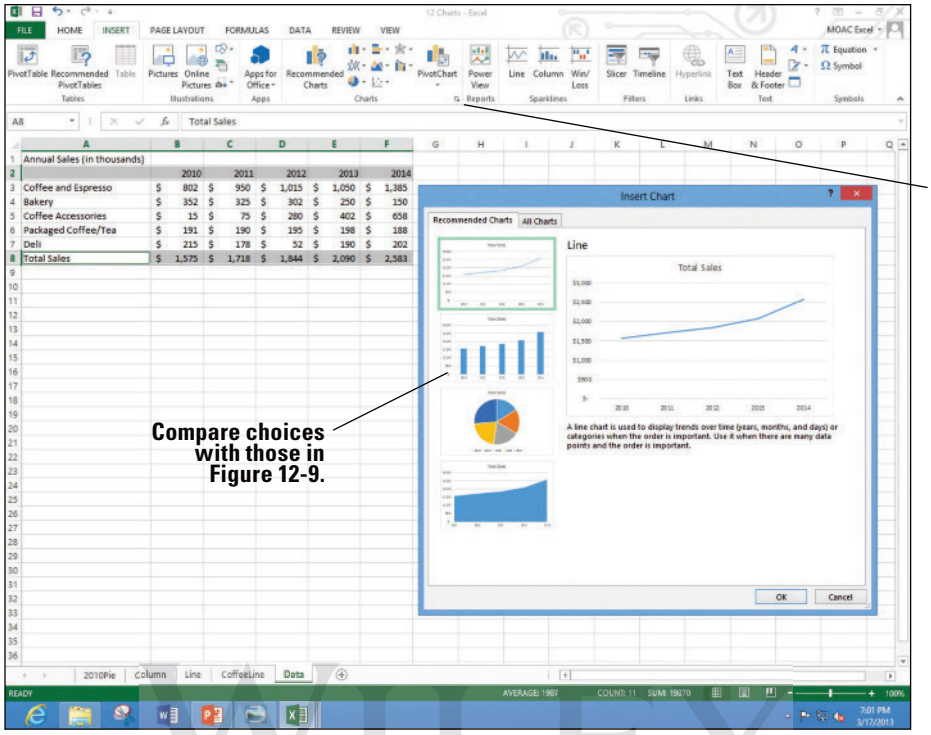


Take Note Notice that three charts are recommended this time compared to the four different charts in . Because 2010-2014 is in the first row in the previous example, charts that show trends are included (line and column). Because the first column is selected this time, charts that compare items are selected (bar, pie, and column charts). There is some overlap in the recommended chart types; column charts are suggested in both cases.

6. Click **Cancel**. Select **A2:F7** and click the **Recommended Charts** button. Look at each of the suggested choices and scan the description. Click **Cancel**.
7. Select **A8:F8** and click the **Recommended Charts** button. Notice that the choices are even different from the options in Figure 12-9. Click **Cancel**.
8. Select **A2:F2**, hold down **Ctrl**, and select **A8:F8**. You do not have to choose adjacent ranges for your data.
9. Click the **Recommended Charts** button. Notice that the recommended choices in Figure 12-11 are the same as Figure 12-9 because the first row includes years and the second row includes values. Click **OK**.

Figure 12-11

Nonadjacent ranges used prior to choosing Recommended Charts



Another Way

You can also select the data and press F11. Excel tries to determine the best chart for the selected data and places this chart on a separate sheet in one step.

10. Click the **Move Chart** button, and in the New sheet box, type **TotalLine**, and then click **OK**.
11. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Creating a Bar Chart

Bar charts are similar to column charts and can be used to illustrate comparisons among individual items. Data that is arranged in columns or rows on a worksheet can be plotted in a bar chart. Clustered bar charts compare values across categories. Stacked bar charts show the relationship of individual items to the whole of that item. The side-by-side bar charts you create in this exercise illustrate two views of the same data. You can experiment with chart types and select the one that best portrays the message you want to convey to your target audience.

STEP BY STEP — Create a Bar Chart

GET READY. USE the workbook from the previous exercise.

1. Click the **Data** worksheet tab.
2. Select cells **A2:F7** and on the INSERT tab, in the Charts group, click the **Bar** button.

Take Note A ScreenTip displays the chart type name when you hover the mouse pointer on its button or subtype option.

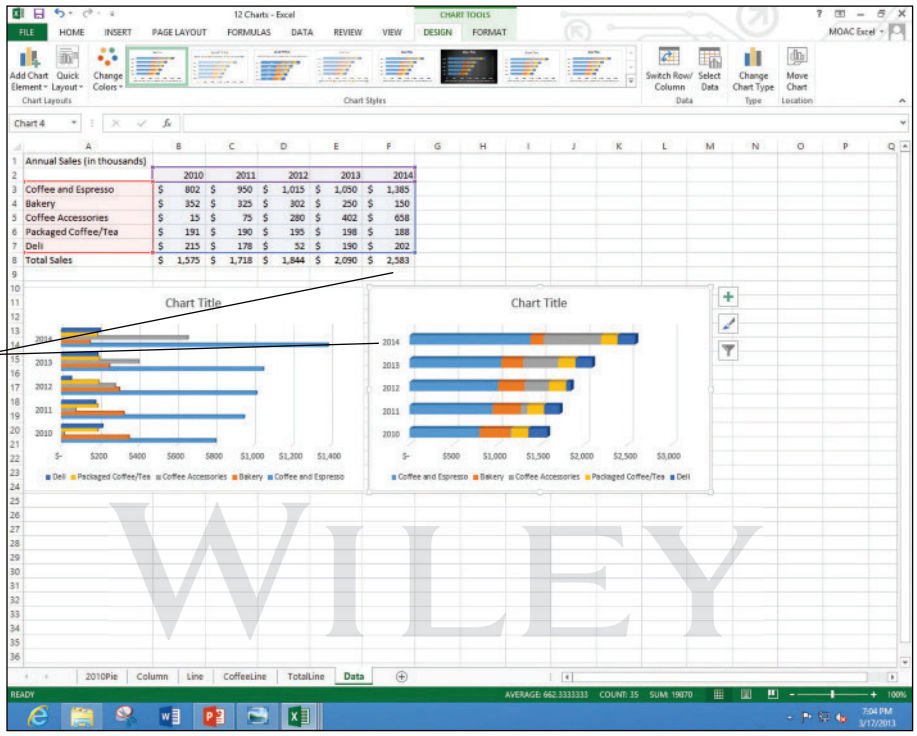
3. Click the **3-D Clustered Bar** subtype. The data is displayed in a clustered bar chart and the DESIGN tab is active on the CHART TOOLS tab.
4. Drag the clustered bar chart to the left, below the worksheet data.
5. Select **A2:F7**. On the **INSERT** tab, in the Charts group, click the **Bar** button.

6. Click the **3-D Stacked Bar** subtype.
7. Position the stacked bar graph next to the 3-D bar graph. Your worksheet should look like Figure 12-12.

Figure 12-12

A clustered bar and stacked bar using the same data as the line and column charts earlier in the lesson (see Figure 12-7).

Each part of bar adds together to show total in the stacked bar.



Another Way

You can open the Insert Chart dialog box by clicking Recommended Charts, and then clicking the All Charts tab. You can also choose any chart button and click the More Charts button on the bottom of any menu.

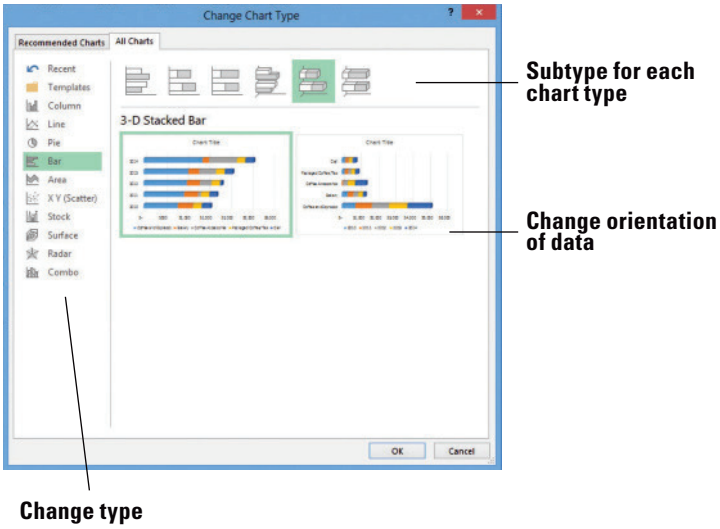
8. Click the **Move Chart** button, and in the New sheet box, type **StackedBar** and click **OK**.
9. Click the **Data** worksheet tab, click the clustered bar chart, click the **Move Chart** button, and in the New sheet box, type **ClusteredBar**, and then click **OK**.
10. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

The Charts group on the INSERT tab contains eight buttons leading to multiple chart types (including a combined chart type). To create one of these charts, select the worksheet data and click the button and choose one of the chart type options. You can select from any chart type by clicking the Charts dialog box launcher (see Figure 12-11) to open the Insert Chart dialog box. The Recommended Charts shows in the first tab. Click on the All Charts tab in the dialog box as shown in Figure 12-13 to see samples of all types and subtypes of charts.

Figure 12-13

All Charts tab of the Insert Chart dialog box



When you click a chart type in the left pane of the dialog box, the first chart of that type is selected in the right pane. You can also scroll through the right pane and select any chart subtype. Different examples display to determine whether you want the data interpreted in rows and columns vs. columns and rows.

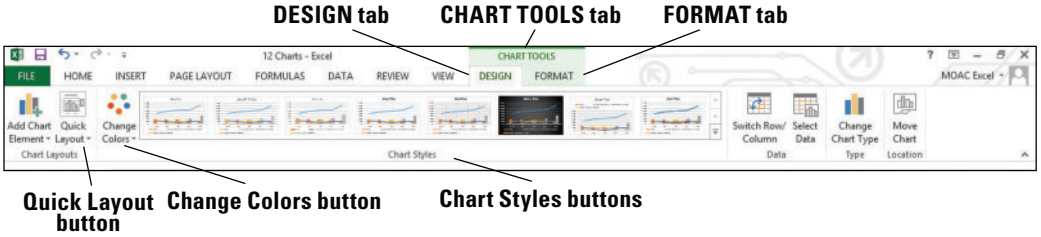
FORMATTING A CHART WITH A QUICK STYLE OR LAYOUT

Bottom Line

After you create a chart, you can instantly change its appearance by applying a predefined style or layout. Excel provides a variety of useful quick layouts and quick styles from which you can choose. As shown in Figure 12-14, when you create a chart, the chart tools become available and the DESIGN and FORMAT tabs and Quick Layout button appears on the ribbon.

Figure 12-14

The CHART TOOLS tab activates when a chart is inserted.



Formatting a Chart with a Quick Style

Predefined layouts and styles are timesaving features that you can use to enhance the appearance of your charts. Quick Styles, as defined by Microsoft, are the chart styles available in the Chart Styles group of the DESIGN tab in the CHART TOOLS tab. They are Quick Styles because you can click them in an instant instead of searching through the Chart Styles gallery. In this exercise, you apply a Quick Style to your chart.

STEP BY STEP Format a Chart with a Quick Style

CERTIFICATION READY? 5.2.4

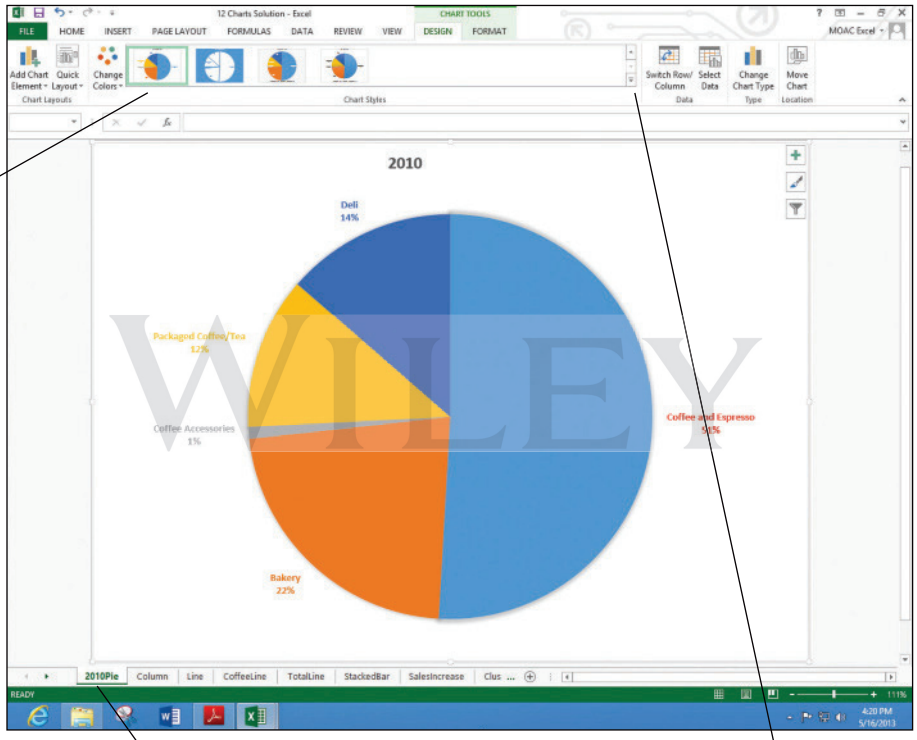
How do you quickly change the style of a chart?

GET READY. USE the workbook from the previous exercise.

1. Click on the **2010Pie** chart tab. If the DESIGN tab is not visible and the buttons active, click the white space inside the chart boundary and click the **DESIGN** tab if necessary.
2. One of the Chart Styles is already selected. Click each of the styles until you come to the style shown in Figure 12-15 with the labels and percentages shown next to each pie slice. If necessary, click the down arrow to select more styles.

Figure 12-15

Pie chart with labels next to each slice



3. The chart colors are determined by the theme of your worksheet. Click the **Change Colors** button and move the mouse pointer over each of the different rows to see the preview of the pie change.
4. Click **Color 3** to make the change.
5. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Take Note You can use the Chart Styles buttons as you are first creating an embedded chart on a worksheet or use them while editing a chart whether it is embedded or a separate chart sheet as shown here.

Formatting a Chart with Quick Layout

In addition to the colors and patterns, you can change which elements appear on your chart and where they appear. This includes items such as axis titles, data tables, and where the legend goes. In this exercise, you will apply a Quick Layout to your chart to display a data table under the chart.

STEP BY STEP Format a Chart with Quick Layout

CERTIFICATION READY? 5.2.4

How do you quickly change the layout of a chart?

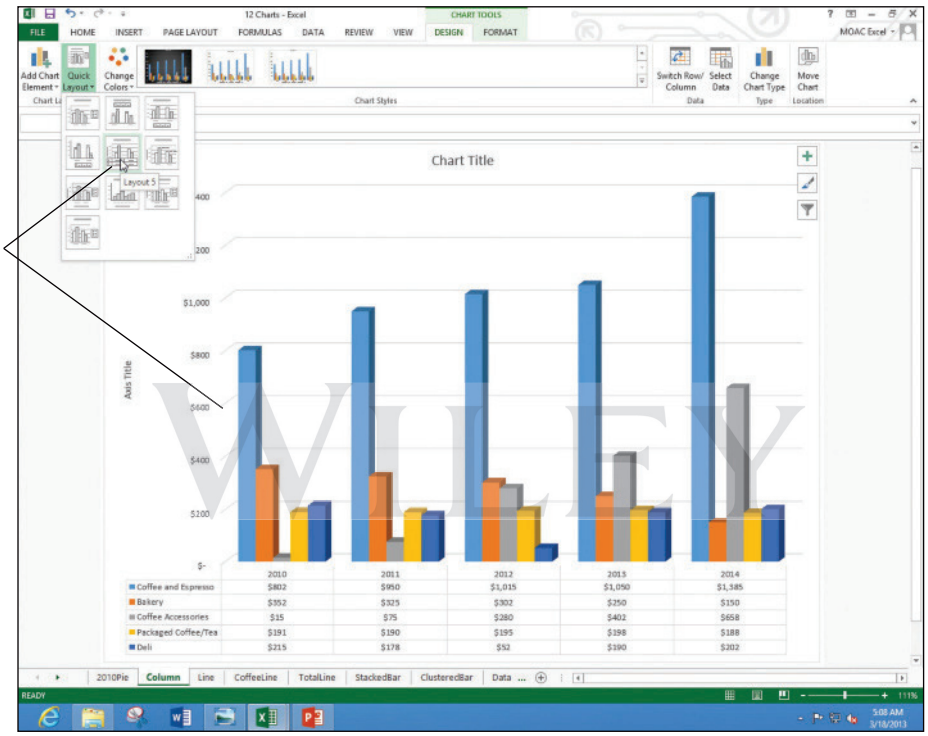
GET READY. USE the workbook from the previous exercise.

1. Click on the **Column** chart tab.
2. On the **DESIGN** tab, click the **Quick Layout** button. As you move to each of the options, the chart changes to preview what the option will look like (see Figure 12-16).

Figure 12-16

Quick Layout choices

Layout 5 selected and shown on the chart



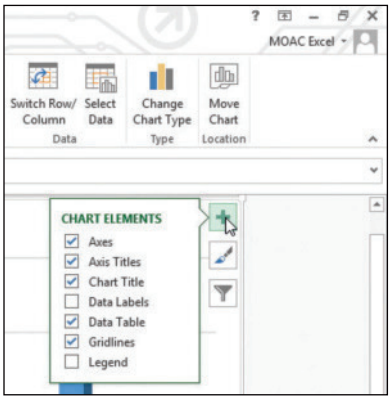
3. Click **Layout 5**. The data table appears under the chart. The years (2010-2014) act as both the x-axis labels and column headers of the data table.
4. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

You can also use the design buttons on the right of a selected chart to change the style and color and which elements appear on the chart. Click on the chart and click the first button to select which items appear on the chart as shown in Figure 12-17.

Figure 12-17

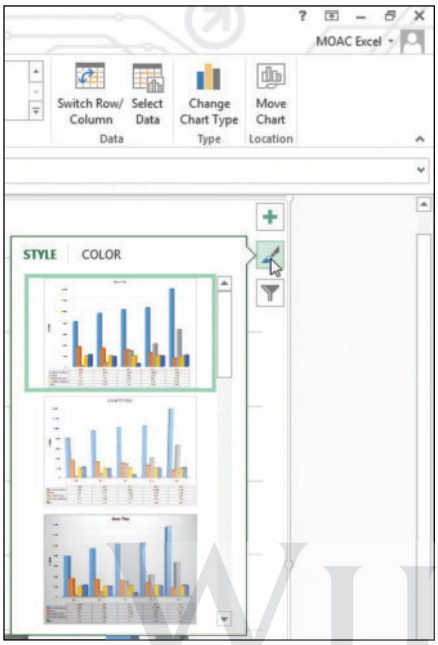
Chart Elements button



Click the second button and choose which style and color you want (see Figure 12-18).

Figure 12-18

The Chart Style button: Style and color options



FORMATTING THE PARTS OF A CHART MANUALLY

Bottom Line

The FORMAT tab provides a variety of ways to format chart elements. To format a chart element, click the chart element that you want to change, and then use the appropriate commands from the FORMAT tab.

CERTIFICATION READY? 5.2.3

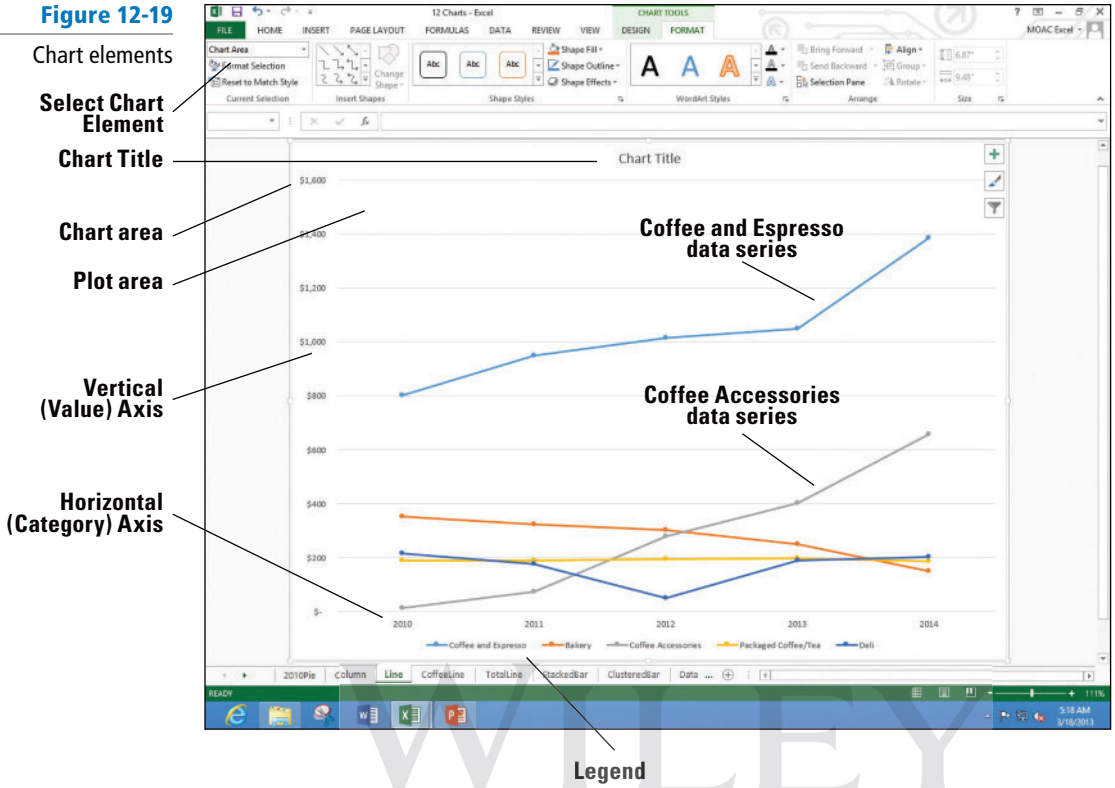
How do you modify different items on a chart style of a chart?

The following list defines some of the chart elements you can manually format in Excel. These elements are illustrated in Figure 12-19:

- **Chart area:** The entire chart and all its elements.
- **Plot area:** The area bounded by the axes.
- **Axis:** A line bordering the chart plot area used as a frame of reference for measurement.
- **Data Series:** Row or column of data represented by a line, set of columns, bars or other chart type
- **Title:** Descriptive text that is aligned to an axis or at the top of a chart.
- **Data labels:** Text that provides additional information about a data marker, which represents a single data point or value that originates from a worksheet cell.
- **Legend:** A box that identifies the patterns or colors that are assigned to the data series or categories in a chart.

Figure 12-19

Chart elements



Take Note To learn the elements of the chart, click the Chart Elements drop-down list and select each of the elements on the sample charts in your workbook.

Editing and Adding Text on Charts

wUp until now we have accepted the default labels on the charts created. You can edit existing labels in a similar way that you do in a worksheet. Click the label, select the text, and type the new text. If the element isn't visible, you can add it by checking the CHART ELEMENTS option or inserting a text box.

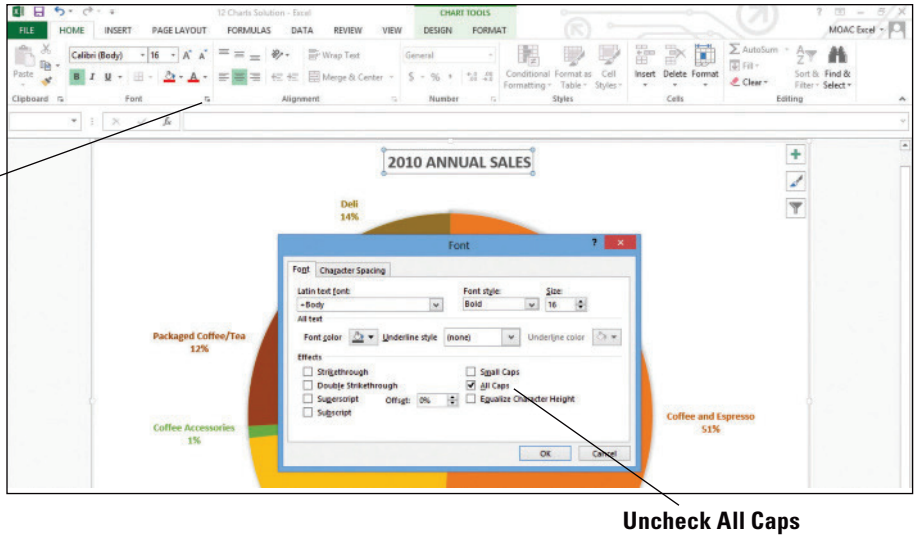
STEP BY STEP **Edit and Add Text on Charts**

GET READY. USE the workbook from the previous exercise.

1. Click the **2010Pie** chart tab.
2. Click the **2010** title, move the insertion point to the end of the label and click. Type a **space** and then type **Annual Sales**. The text appears in all caps based on the current layout.
3. Select the label text. Click the **HOME** tab and click the **Font dialog box launcher**. The Font dialog box appears (see Figure 12-20).

Figure 12-20

Chart Font dialog box



4. Click the **All Caps** check box to uncheck this option. Click **OK**.
5. Click on the **FORMAT** tab and click the **Text Box** button. Click the bottom left corner of the chart area and type your initials and today's date in the text box.
6. Edit the chart titles on each of the charts as follows:

Chart	Title	Text
Column	Chart Title	**Annual Sales**
Column	Axis Title	**Thousands**
Line	Chart Title	**Annual Sales (Thousands)**
StackedBar	Chart Title	**Annual Sales**
ClusteredBar	Chart Title	**Annual Sales**

7. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Formatting a Data Series

Use commands on the FORMAT tab to add or change fill colors or patterns applied to chart elements. Select the element to format and click on one of the buttons on the ribbon or display the Format pane to add fill color or a pattern to the selected chart element.

STEP BY STEP — Format a Data Series

GET READY. USE the workbook from the previous exercise.

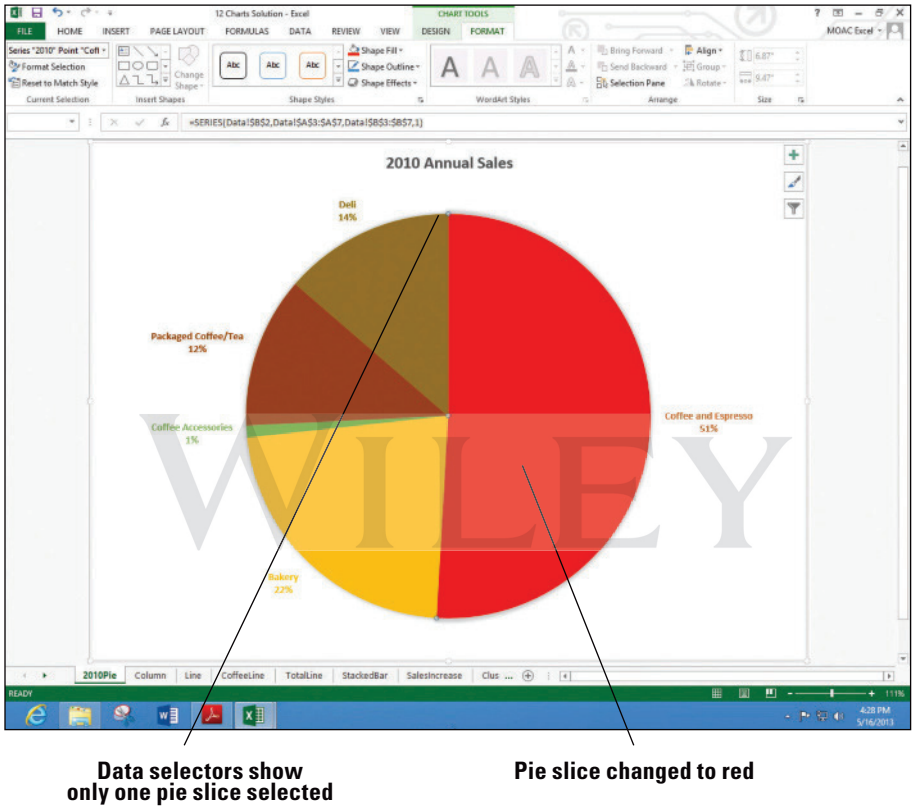
1. Click the **2010Pie** chart tab.
2. Click in the largest slice of the pie. You can see data selectors around each of the pie slices.
3. Click the **FORMAT tab**, click the **Shape Fill** button, and then choose **Red** in the Standard Colors section. All the slices of the pie change to red. Click **Undo**. You want to select the largest pie slice instead of all of the pie slices.

4. Click the largest pie slice again and you should see data selectors only on the slice. Click the **Shape Fill** button and choose **Red**. The Coffee and Espresso pie slice changes to Red, as shown in Figure 12-21.

Take Note The first click on a data series selects the whole series. The second click selects the individual marker for the series.

Figure 12-21

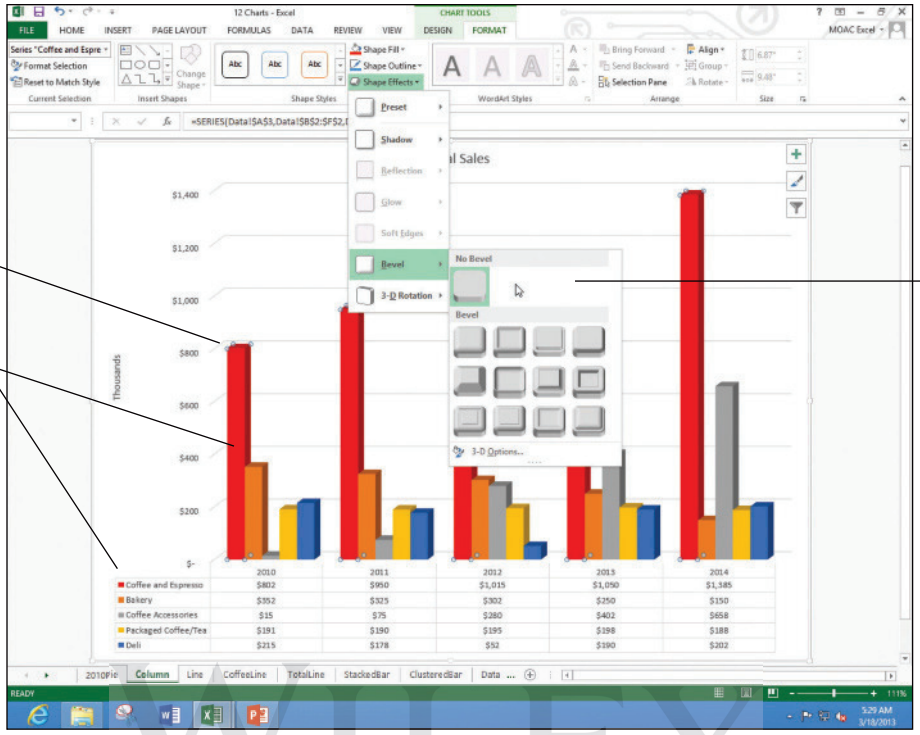
Change color of data element



5. Click the **Column** chart tab.
6. Click the tallest bar (Coffee and Espresso). Notice that the five bars have data selectors. Click the **Shape Fill** button and select **Red**. All five bars and the legend color for Coffee and Espresso changes to red.
7. Click the **Shape Effects** button, click **Bevel** and notice the options available (see Figure 12-22).

Figure 12-22

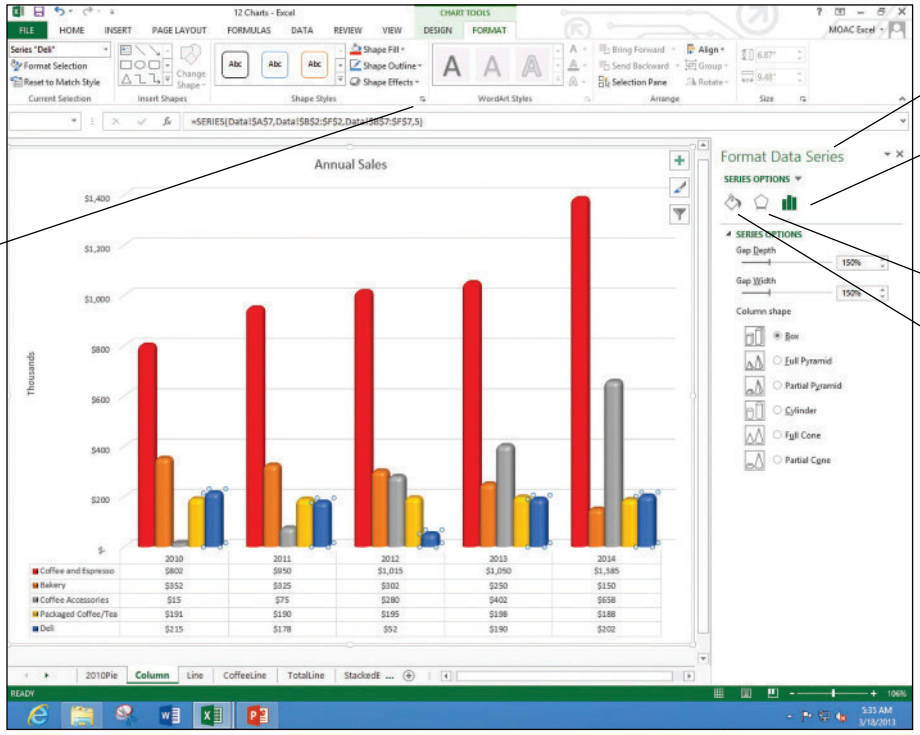
Shape Effects menu



8. Click the **first** Bevel option (Circle). Repeat this option for each of the data series. The chart now looks like Figure 12-23.

Figure 12-23

Beveled columns



9. In addition to the Shape Fill, Shape Outline, and Shape Effects buttons, you can also change the elements with the Shape Styles dialog box launcher. On the FORMAT tab, in the Shape Styles group, click the **Shape Styles dialog box launcher**. The Format Data Series pane opens with the Series Options button selected.
10. Click each of the three buttons under the Series Options label and look at the choices. Click one of the **Coffee Accessories** columns.
11. Click the **Fill & Line** button, choose **FILL**, and select **Picture or texture fill** from the options.
12. Click the **Texture drop-down arrow** and choose the **Brown Marble** option.
13. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

When you use the mouse to point to an element in the chart, the element name appears in a ScreenTip. You can select the element you want to format by clicking the arrow next to the Chart Elements box in the Current Selection group on the FORMAT tab. This list is chart specific. When you click the arrow, the list will include all elements that you have included in the displayed chart.

Changing the Chart's Border Line

You can create an outline around a chart element. Just select the element and apply one of the predefined outlines or click Shape Outline to format the shape of a selected chart element. You can also click the Shape Styles dialog box launcher to bring up the pane with menu choices for the way the element looks. You can even apply a border around the entire chart. Select an element or the chart and use the colored outlines in the Shape Styles group on the FORMAT tab, or click Shape Outline and choose a Theme or Standard color for the border.

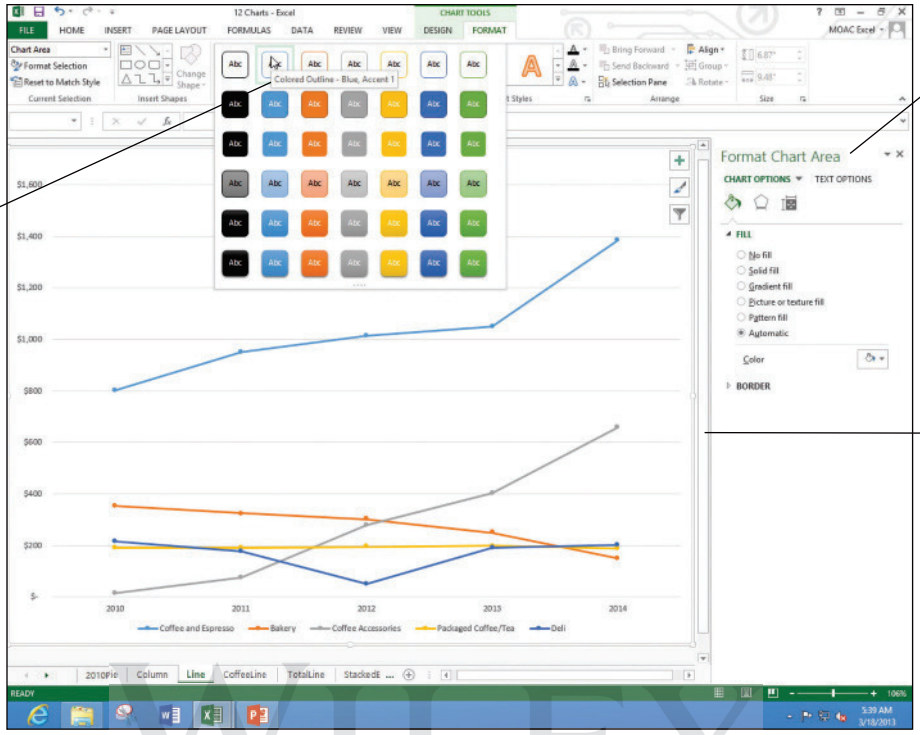
STEP BY STEP Change the Chart's Border Line

GET READY. USE the workbook from the previous exercise.

1. Click the **Line** chart tab and choose the **FORMAT** tab.
2. In the Current Selection group, click the **arrow** in the Chart Elements selection box and click **Chart Area**. The chart area section on the chart becomes active.
3. Click the **More arrow** in the Shape Styles group. The Shape Styles gallery opens.
4. Scroll through the outline styles to locate Colored Outline – Blue, Accent 1, as shown in Figure 12-24.

Figure 12-24

Shape Styles gallery Gallery



5. Click **Colored Outline – Blue, Accent 1**. You might not notice a change. This is because the Width of the line may be set so thin you can't see it.
6. In the Format Chart Area pane, click the **BORDER arrow** to expand that section.
7. Click the **Width up arrow**, until you get to 2.5 pt. Now you can see that the chart is outlined with a light blue border.
8. Click the **Coffee and Espresso** line.
9. In the **Color** drop-down, under the LINE section, choose **Red**.
10. SAVE your workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Modifying a Chart's Legend

You can modify the content of the legend, expand or collapse the legend box, edit the text that is displayed, and change character attributes. A finished chart should stand alone—that is, the chart should contain sufficient data to convey the intended message. In the chart you modify in this exercise, changing the font colors in the legend to match the blocks in the columns provides an additional visual aid that enables the viewer to quickly see the income contribution for each category.

STEP BY STEP — Modify a Chart's Legend

CERTIFICATION READY? 5.2.1

How do you add a chart legend?

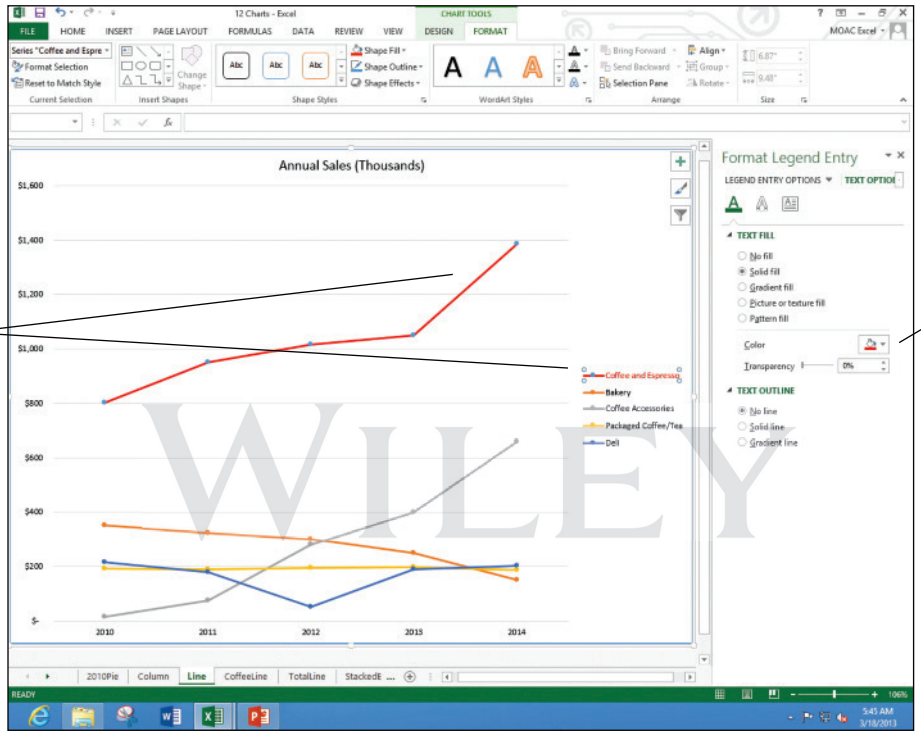
GET READY. USE the workbook from the previous exercise.

1. Click the **Line** chart tab.
2. On the **FORMAT** tab, click the **Chart Elements drop-down arrow**, and choose **Legend**.
3. If the Format Legend pane does not appear, click the **Shape Styles dialog box launcher**.
4. Click the **Legend Options** button.

5. In the Legend Position section, click **Right** to move the legend to the right side of the chart.
6. Click the **Coffee and Espresso** label in the legend.
7. Click the **TEXT OPTIONS** button to display the menus for the text.
8. In the Fill Color drop-down, choose **Red** so the text in the legend matches the line color (see Figure 12-25).

Figure 12-25

Changing Legend text color



9. Click the **2010Pie** chart tab.
10. Click the **Coffee and Espresso** label twice. If necessary, click the **TEXT OPTIONS** button and underneath TEXT FILL, click the **Color** button, and choose **Red** to change the text color.
11. CLOSE the Format Data Label pane and SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

MODIFYING A CHART

Bottom Line

Sometimes the chart that you add from the INSERT tab and modify through the Quick Layout and Chart Styles still isn't exactly what you want. In addition to using the creation and design features mentioned previously, you can modify a chart by adding or deleting individual elements or by moving or resizing the chart. You can also change the chart type without having to delete the existing chart and create a new one or change how Excel selects data as its data elements by changing rows to columns.

Adding Elements to a Chart

Adding elements to a chart can provide additional information that was not available in the data you selected to create the chart. In some cases adding data labels helps make the charts more understandable. In this exercise, you learn to use the CHART ELEMENTS button to add items to a chart.

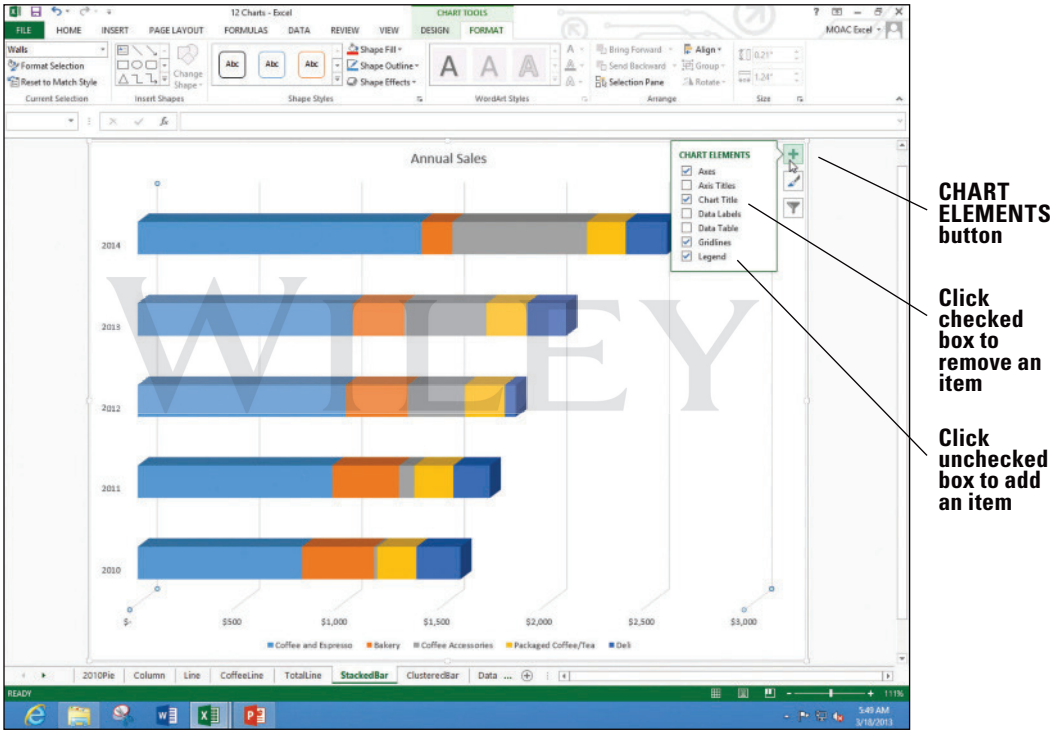
STEP BY STEP Add Elements to a Chart

GET READY. USE the workbook from the previous exercise.

1. Click the **StackedBar** chart tab.
2. If necessary, click in a white space of the chart to select the chart and make the buttons in the upper right hand corner appear.
3. Click the **CHART ELEMENTS** button. A menu appears showing which elements are currently on the chart (checked boxes) and which are not (unchecked boxes). See Figure 12-26.

Figure 12-26

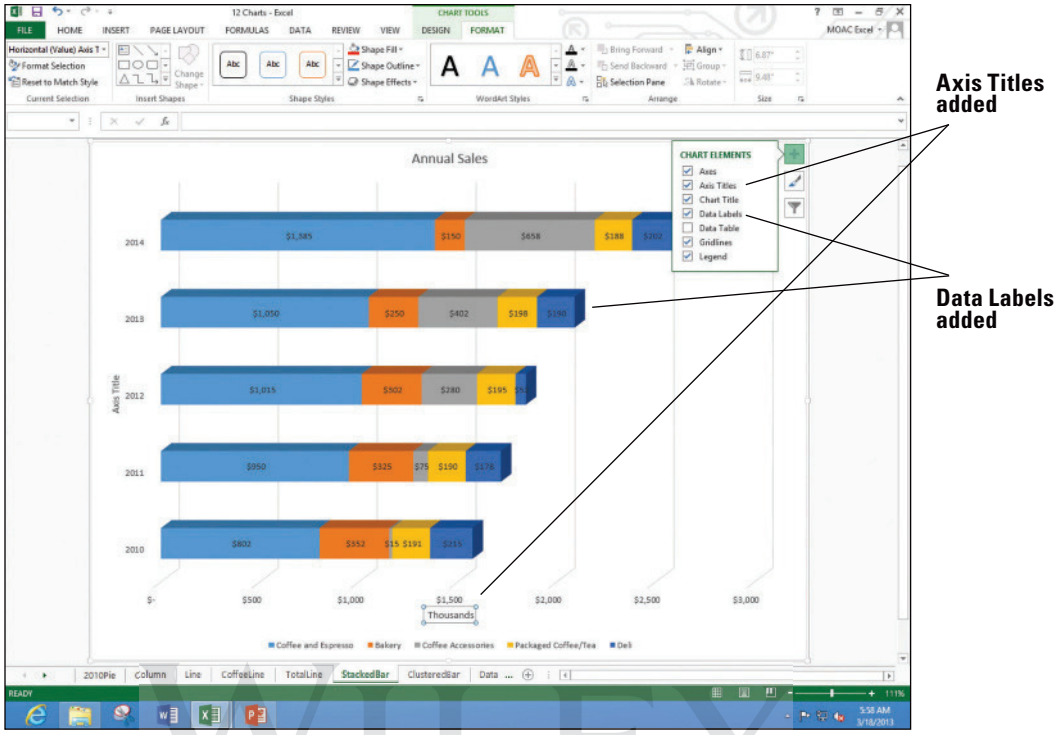
Current Chart Elements



4. Click the **Axis Titles** box to check the box and add both a vertical and horizontal axis placeholder.
5. The Axis Title on the bottom of the screen has selection indicators to indicate it is selected. Type **Thousands** and press **Enter**.
6. Click the **TotalLine** chart tab, click the **CHART ELEMENTS** button, and select the **Axis Titles** option. This time the vertical Axis Title is selected. You can click any label placeholder to select it if it is already on a chart. Type **Thousands** for the vertical title.
7. Repeat the previous step to add a vertical axis title of Thousands for the CoffeeLine chart and the horizontal axis title for the ClusteredBar chart.
8. Click the **StackedBar** chart tab, click the **CHART ELEMENTS** button, and select the **Data Labels** option. Labels appear for each of the bars on the chart as shown in Figure 12-27.

Figure 12-27

Data Labels added to the chartw



Another Way
You can also click a text box, select the text and type the new text.

9. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Deleting Elements from a Chart

When a chart becomes too cluttered, you may need to delete nonessential elements. You can select an element on the chart and press the Delete key. You can also select an element in the Chart Elements drop-down in the Current Selection group and press Delete. You will use this next exercise to delete elements from some charts. Since the years are obvious and you do not always need an axis title you will delete the generic Axis Title labels. You will also create a copy of the StackedBar chart tab and only show items that are consistently increasing over the five years.

STEP BY STEP — Delete Elements from a Chart

GET READY. USE the workbook from the previous exercise.

1. On the **StackedBar** chart sheet tab, click the vertical **Axis Title** and press **Delete**.
2. Repeat Step 1 to delete the following generic Axis Title labels:

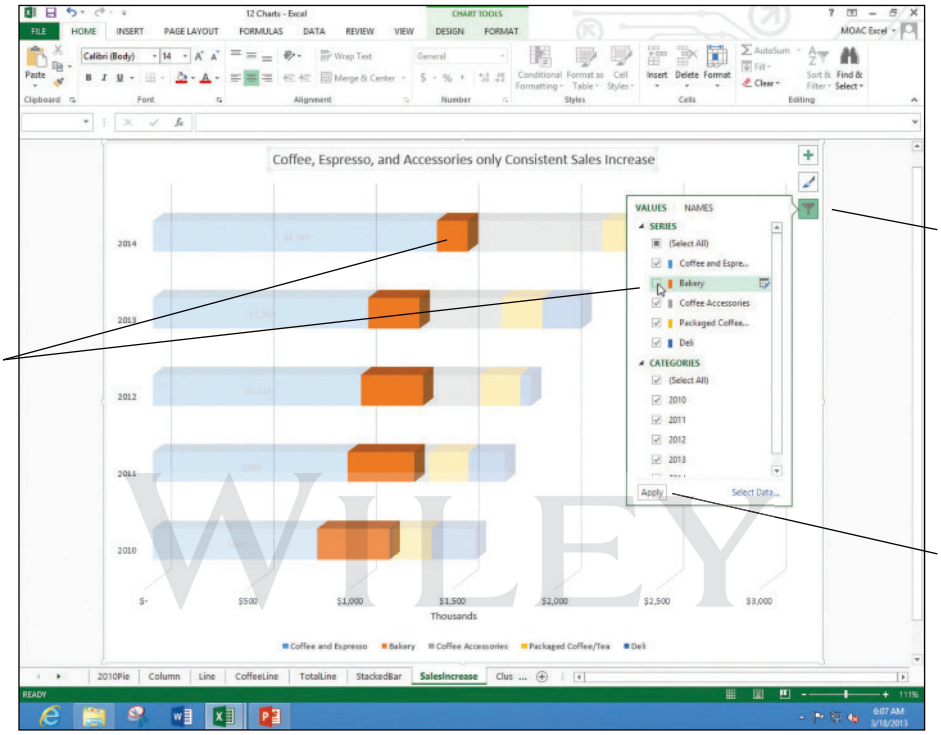
Chart tab	Vertical or Horizontal Axis Title
CoffeeLine	Horizontal
TotalLine	Horizontal
ClusteredBar	Vertical

3. Right-click the **StackedBar** chart tab and select **Move or Copy**. In the Before sheet list box, Select **ClusteredBar**, click the **Create a copy** check box, and then click **OK** to create another copy of the StackedBar chart.
4. Double-click the **StackedBar (2)** label for the tab and type **SalesIncrease** for the new name.
5. Click the **$150** data label for the Bakery in 2014. All data labels for bakery have selection indicators. Press **Delete**.
6. Repeat Step 5 for Coffee Accessories, Packaged Coffee/Tea, and Deli data labels.

7. Click the Annual Sales title and type **Coffee, Espresso, and Accessories only Consistent Sales Increase**. Press **Enter**.
8. You can also hide data series. Click the **Chart Filters** button on the right side of the chart and in the SERIES group, click **Bakery** to uncheck it (see Figure 12-28).

Figure 12-28

Uncheck series you do not want to appear on the chart.



Another Way

You can also delete a chart element by right-clicking on the element and selecting Delete.

9. Repeat step 8 for Packaged Coffee/Tea and Deli and click the **Apply** button.
10. After looking at the chart, you might decide it is better to keep all of the data series. Repeat Steps 8 and 9 to recheck the Bakery, Packaged Coffee /Tea, and Deli series.

Take Note Compare this to previous versions of Excel when you removed series from a chart. The Chart Filters button is much easier to put the series back on.

11. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Take Note It is important to remember that whether the chart is embedded in the worksheet or located on a chart sheet, the chart is linked to the worksheet data. Any changes in the worksheet data are reflected in the chart. Likewise, if the worksheet data is deleted, the chart is also deleted.

Adding Additional Data Series

You might need to add additional data to a chart. In this case the CEO of the company has asked you to create a new data sheet that breaks out coffee and espresso and packaged coffee and tea to see if you can see any new trends.

STEP BY STEP — Add Additional Data Series

GET READY. USE the workbook from the previous exercise.

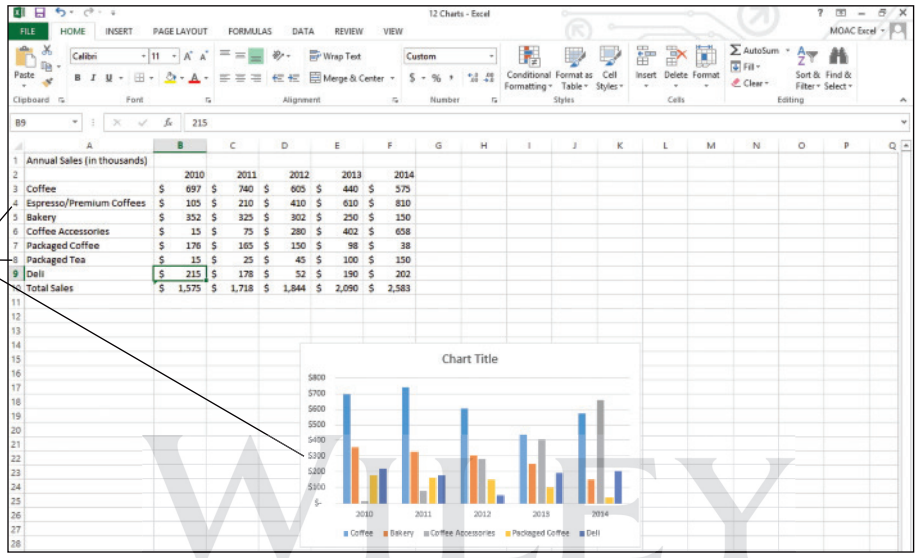
1. Right-click the **Data** worksheet tab, select **Move or Copy**, scroll to the bottom of the Before sheet list, and select **(move to end)**. Click the **Create a copy** checkbox and click

OK. Double-click the **Data (2)** tab, type **DataExp**, and then press **Enter**.

2. Select **A2:F7**, click the **INSERT** tab, click the **Insert Column Chart** button, and then under 2-D Column, click the **Clustered Column** option.
3. Insert rows below Coffee and Espresso and Packaged Coffee/Tea. Edit the labels and values as shown in Figure 12-29.

Figure 12-29

Edited Annual Sales with new categories



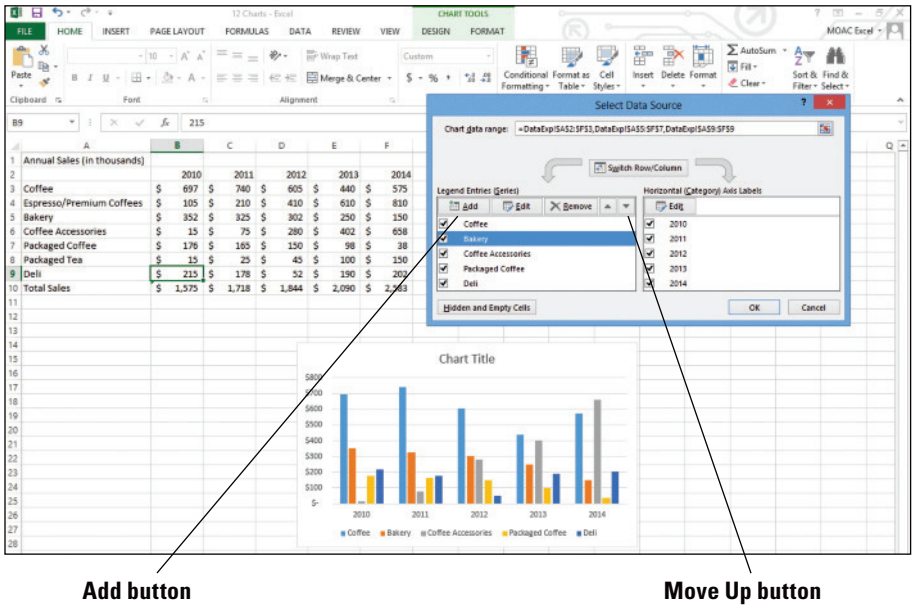
Another Way

You can also click the DESIGN tab and the Select Data button.

4. Right-click in a blank area of the chart, and choose **Select Data**. The Select Data Source dialog box opens (see Figure 12-30).

Figure 12-30

Select Data Source dialog box

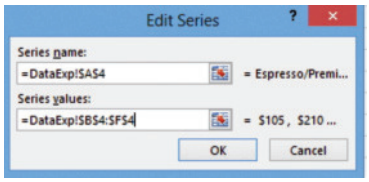


Take Note In the previous section, you used the Chart Filter button to remove data series. You can also use this Select Data Source dialog box to remove data series.

5. Click the **Add** button and in the Series name box, click cell **A4**. In the Series values box, delete the entry and drag on the worksheet to select cells **B4:F4**. The Edit Series dialog box looks like Figure 12-31.

Figure 12-31

Edit Series dialog box



CERTIFICATION READY? 5.1.2

How do you add additional data series?

6. Click **OK**, then click the **Move Up** button multiple times to move the Espresso/Premium Coffees label below Coffee.
7. Repeat Steps 5 and 6 with Packaged Tea in A8 and the data in B8:F8 so the label is below Packaged Coffee. Click **OK** to accept the changes and return to the sheet.
8. SAVE the workbook.

Another Way

You can also highlight the data in the worksheet, click Copy, click on the chart, and click Paste to add a data series to a chart.

PAUSE. LEAVE the workbook open for the next exercise.

Resizing a Chart

You can point to a corner of a chart or the midpoint of any side to display sizing handles (two-sided arrows). Use the side handles to change the chart height or width. Use the corner sizing handles to change both height and width. Increasing the size of a chart makes it easier to read, especially if it is an embedded chart. Be cautious when you reduce the size of a chart, however. Titles and legends must be readable. In this exercise, you learn to resize the chart.

STEP BY STEP — Resize a Chart

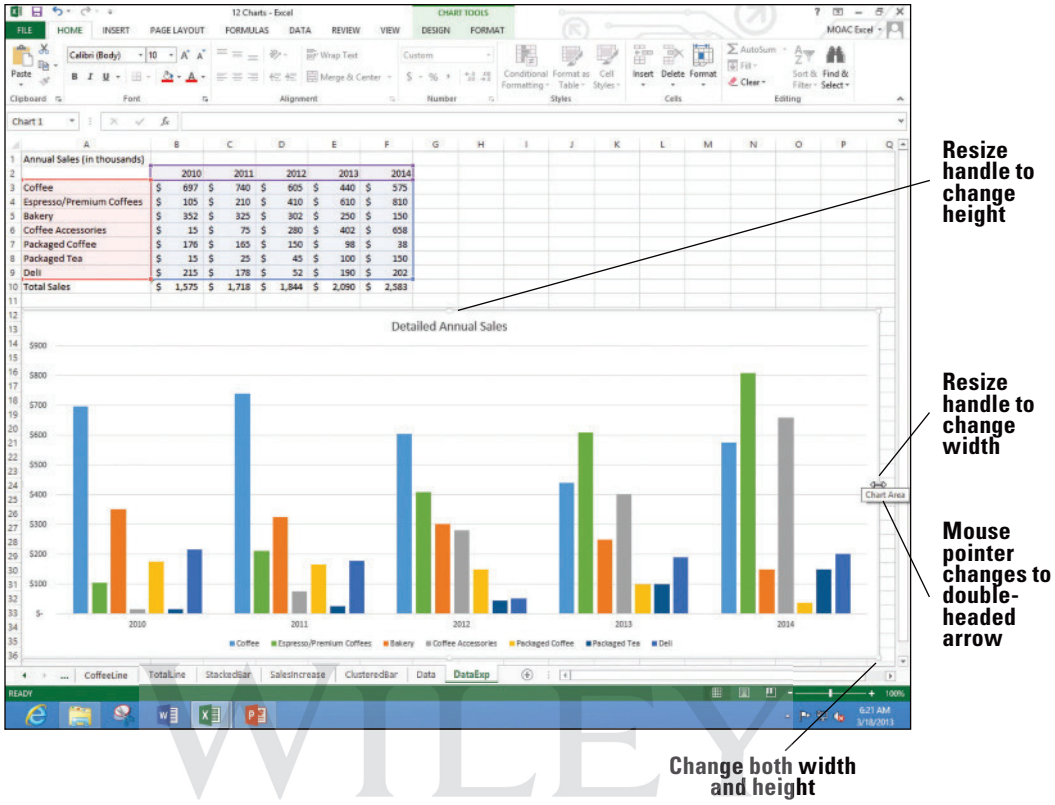
GET READY. USE the workbook from the previous exercise. The DataExp sheet should be selected.

CERTIFICATION READY? 5.2.2

How do you change the size of a chart?

1. Move the mouse to the white space to the left of the chart title. The mouse is a black four-headed arrow. Drag to move the chart to the left edge of the sheet and below row 11.
2. Move the mouse to the bottom right corner of the chart. The mouse pointer is a two-headed diagonal arrow on the resize handle. Drag the mouse so it is in the bottom right corner of the screen. The chart expands to take up more of the screen and you can see the columns and legend easier.
3. Click the **Chart Title** and type **Detailed Annual Sales**. Click back in the chart to select the chart and move to the right center resize handle. Your screen should look similar to Figure 12-32.

Figure 12-32
Resized chart



Take Note You can click any selection handle on the chart border and drag to increase the height, width, or both.

4. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Choosing a Different Chart Type

For most 2-D and 3-D charts, you can change the chart type and give it a completely different look. If a chart contains multiple data series, you can also select a different chart type for any single data series, creating a combined chart. You cannot combine a 2-D and a 3-D chart, however.

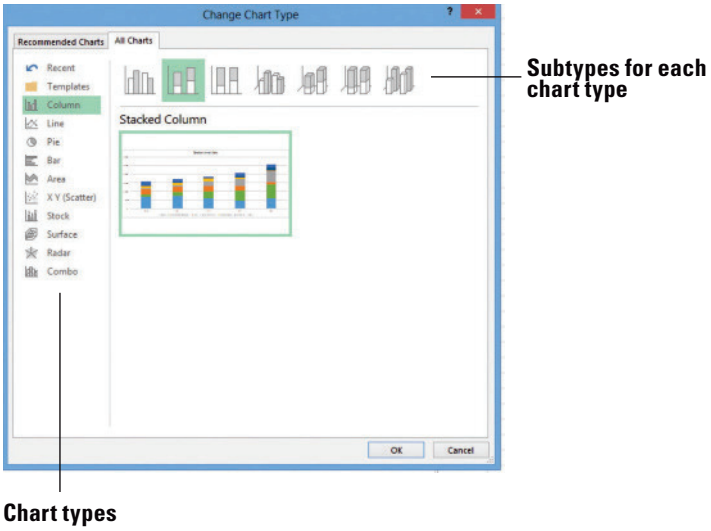
STEP BY STEP — Choose a Different Chart Type

GET READY. USE the workbook from the previous exercise. The DataExp sheet should be visible and the chart selected.

1. Click the **DESIGN** tab and select the **Change Chart Type** button. The Change Chart Type dialog box opens.
2. Click each of the chart types on the left and you will see a set of different icons representing subtypes for each of the chart types. Click the **Column** button. Click the **Stacked Column** subtype (second icon in the right pane, at the top of the dialog box). The screen should look like Figure 12-33.

Figure 12-33

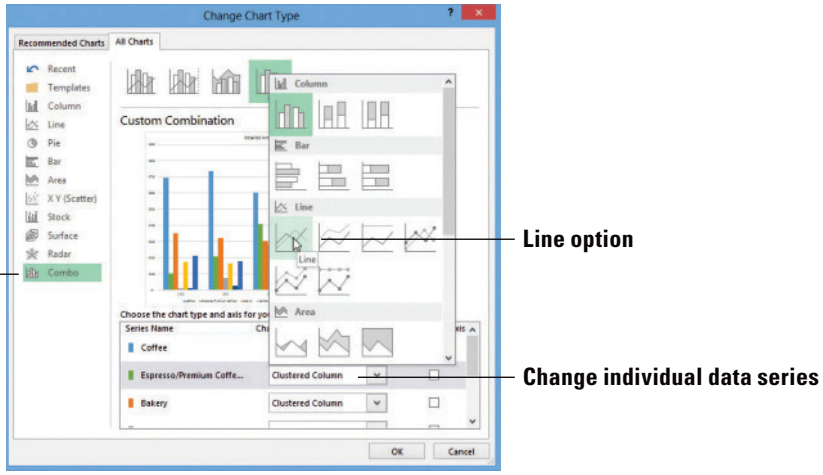
Change Chart Type dialog box



3. Click **OK**.
4. Click the **Move Chart** button and in the New sheet box, type **DetSales**, and then click **OK**.
5. COPY the DetSales chart sheet before the DataExp sheet and name the tab **DetSalesEs**.
6. On the **DESIGN** tab, using the **Change Chart Type** button, change the chart back to a **Clustered Column**.
7. Click just one of the **Espresso/Premium Coffees** columns.
8. On the DESIGN tab, click the **Change Chart Type** button.
9. The Change Chart Type box opens to the Combo chart type. In the Espresso/Premium Coffees Chart Type box, select **Line** (see Figure 12-34).

Figure 12-34

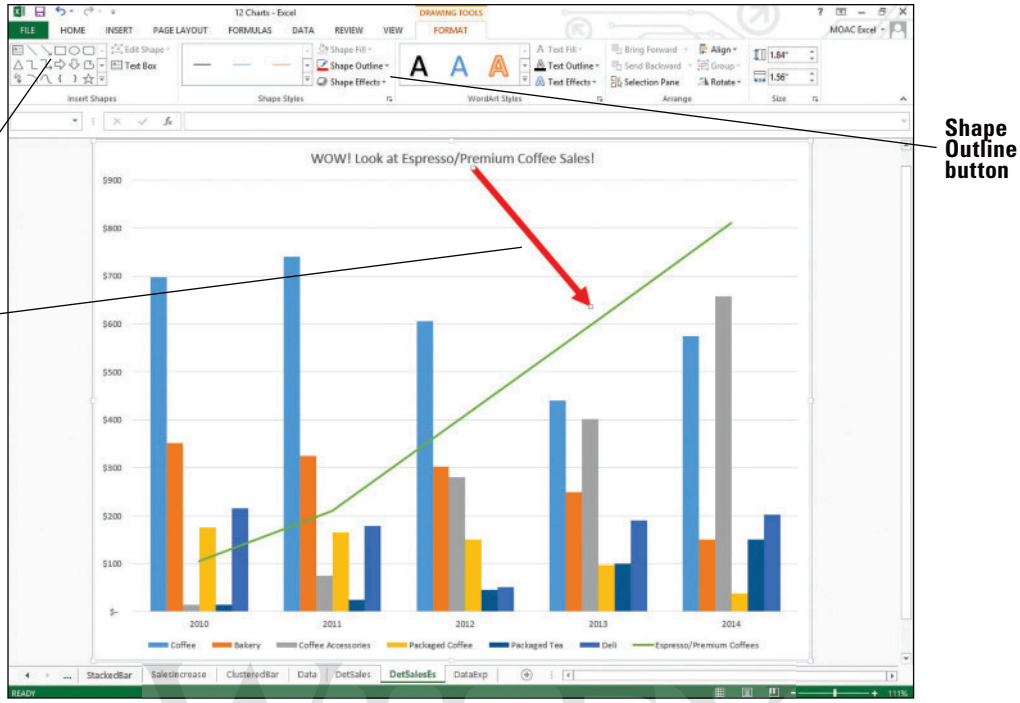
Change Chart Type with Combo chart type



10. Click **OK** and edit the chart title to read **WOW! Look at Espresso/Premium Coffee Sales!**
11. Click the **FORMAT** tab and in the Insert Shapes group, click the **Arrow** button and drag the arrow from the chart title to the Espresso line. Use the Shape Outline button to change the arrow to **Red** and the Weight to **6 pt**. Your chart should look similar to Figure 12-35.

Figure 12-35

Espresso/Premium Coffee Sales chart



12. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Switching Between Rows and Columns in Source Data

You might want to change the orientation of your chart so that the categories are along the horizontal axis instead of the years or vice versa.

STEP BY STEP — Switch Between Rows and Columns in Source Data

GET READY. USE the workbook from the previous exercise.

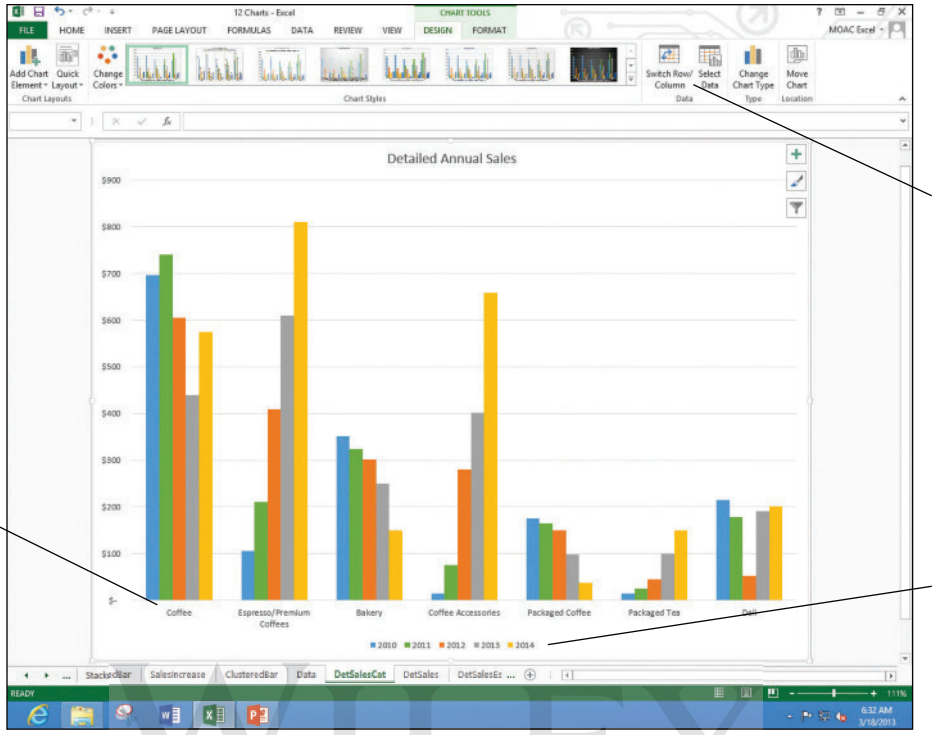
CERTIFICATION READY? 5.1.3

How do you switch between rows and columns in source data?

1. COPY the DetSales chart sheet before the DataExp sheet and name the tab **DetSalesCat**.
2. On the DESIGN tab, use the **Change Chart Type** button to change the chart back to a **Clustered Column**.
3. The horizontal axis shows each year and the categories repeat within each year. We're going to change the chart so each category is a group and each year is shown as a different bar color. On the DESIGN tab, click the **Switch Row/Column** button. The chart changes (see Figure 12-36).

Figure 12-36

Rows and columns switched (legend and categories changed)



4. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

USING NEW QUICK ANALYSIS TOOLS

Bottom Line

Excel 2013 includes a new feature that allows analysis of data with a few clicks of the mouse. You select a data range, and the new Quick Analysis button appears, allowing you to quickly create charts, add tiny miniature graphs called **sparklines**, work with totals, format the data with conditional formatting, and create PivotTables.

Adding a Chart or Sparklines

In addition to the INSERT tab and F11 key, the new Quick Analysis button allows you to quickly add charts to your workbook. After you add the chart, you can modify it using the exercises above.

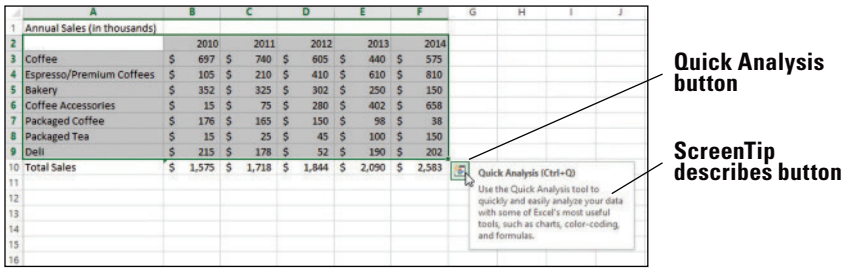
STEP BY STEP **Add a Chart or Sparklines**

GET READY. USE the workbook from the previous exercise.

1. Click the **DataExp** worksheet tab. Select cells **A2:F9**. The new Quick Analysis icon appears at the bottom right of the selected range. Move the mouse pointer to the button and the ScreenTip displays (see Figure 12-37).

Figure 12-37

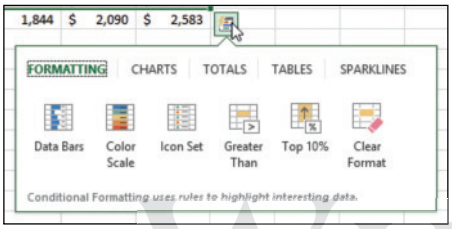
Quick Analysis button and ScreenTip



2. Click the **Quick Analysis** button. A small window called the Quick Analysis gallery opens (see Figure 12-38).

Figure 12-38

Quick Analysis gallery



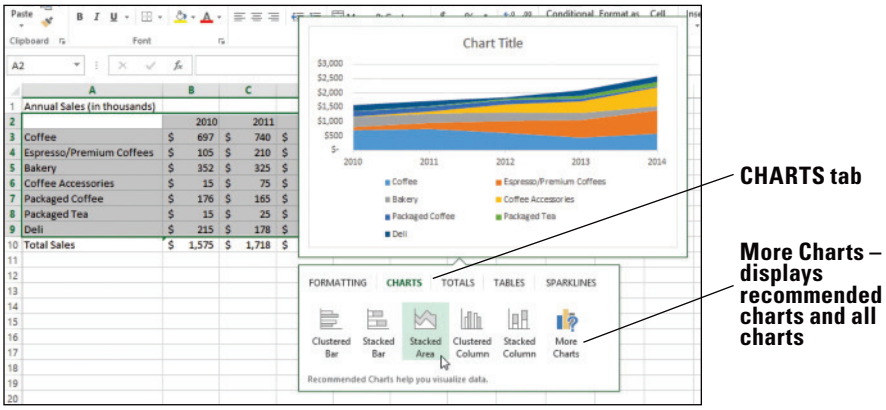
Another Way

You can also press Ctrl + Q to open the Quick Analysis gallery.

3. Click the **CHARTS** tab in the gallery. The options change in the lower part of the gallery. Move the mouse pointer to each of the charts and a preview appears on the screen above the Quick Analysis gallery. For example, move the mouse pointer to the Stacked Area option and you'll see a preview showing this type of chart (see Figure 12-39).

Figure 12-39

Stacked Area chart previewed



Take Note If you click the More Charts option, Excel displays the Insert Chart dialog box, with the Recommended Charts and All Charts tabs discussed earlier in this lesson.

CERTIFICATION READY? 2.3.2

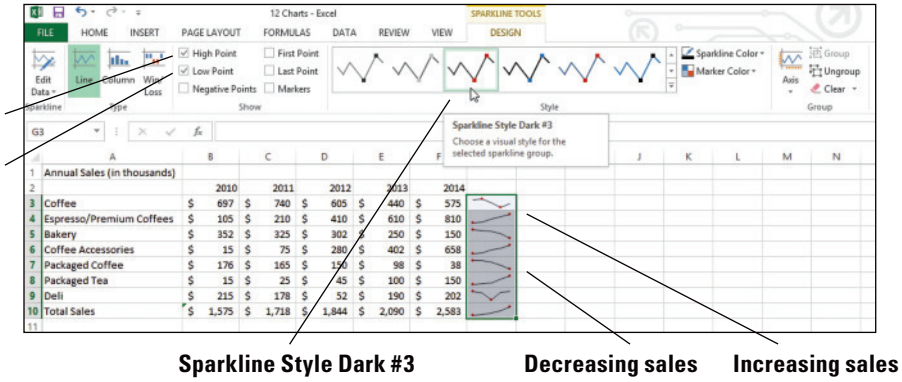
How do you add sparklines to a data range?

4. We will not add any charts from the CHARTS menu at this time. Click the **SPARKLINES** tab. Move the mouse pointer to preview the Column option. A set of tiny column charts shows in column G.
5. Click the **Line** option. A series of lines appear in your worksheet in column G.
6. Row 2 (years) should not have a sparkline. Click cell **G2** and on the DESIGN tab, click the **Clear** button. The sparkline is removed in that cell. In cell G2, type **Sparkline**.
7. Click cell **G9**. Use the fill handle to drag to cell **G10**. A sparkline appears for the total.
8. Select **G3:G10** and click the **DESIGN** tab. There are a number of options you can do with the sparklines.
9. In the Show group, click **High Point** and **Low Point** and in the Style gallery, choose

Sparkline Style Dark #3 (see Figure 12-40).

Figure 12-40

Sparklines in column G



Take Note The DESIGN tab changes to SPARKLINE TOOLS when you have sparklines selected. Take the time to explore the options on the ribbon shown in Figure 12-40.

10. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Working with Totals

The Quick Analysis button can also quickly add SUM, AVERAGE, and COUNT functions as well as %of Total and Running Totals to either the bottom row or to the right of the data.

STEP BY STEP — Work with Totals

GET READY. USE the workbook from the previous exercise and click on the Data worksheet tab.

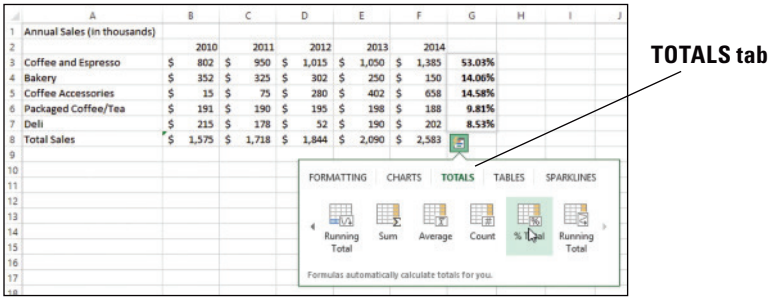
CERTIFICATION READY? 5.1.4

How do you use Quick Analysis to add totals?

1. Select **A3:F7**. Click the **Quick Analysis** button and select the **TOTALS** tab.
2. Move to the first icon, Sum (with the blue row highlighted in the icon). You'll see a preview on the worksheet of Sum overwriting the Total Sales row that was already there.
3. Move to the next icon and you'll see row 8 previewed with Averages for each column. Move to each of the Count, % Total, and Running total icons and watch the preview of the worksheet change.
4. Move to the second Sum icon (with the orange column highlighted). Notice that the worksheet preview changes to show totals in column G.
5. Click the **arrow** on the right to show more options. Preview each of the options and return to % Total (see Figure 12-41).

Figure 12-41

% Total appears in column G



6. Click the **% Total** option. Click cell **G3** and notice that the formula =SUM(B3:F3)/SUM($B$3:$F$7) appears in the formula bar.
7. In cell G2, type **Average**.
8. SAVE the workbook.

PAUSE. LEAVE the workbook open for the next exercise.

Applying Conditional Formatting

The Quick Analysis gallery also has a FORMATTING tab that allows you to format the cell data in different ways. You can show tiny bars so the cells look like a bar chart, change the colors for high and low values and other options.

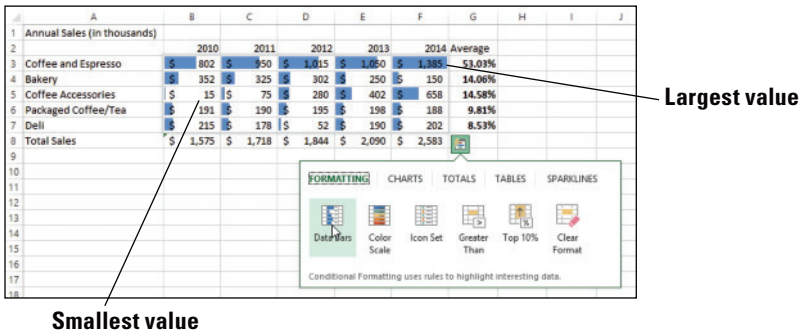
STEP BY STEP — Apply Conditional Formatting

GET READY. USE the workbook from the previous exercise. You should still be on the Data worksheet tab.

1. Select **A3:F7**. Click the **Quick Analysis** icon. The **FORMATTING** tab is selected.
2. Move to the first icon, Data Bars. You can see a preview on the worksheet of small bars in each cell indicating the relative value in the cell. The largest value is in F3 and the bar shows the largest width (see Figure 12-42).

Figure 12-42

Data Bars preview



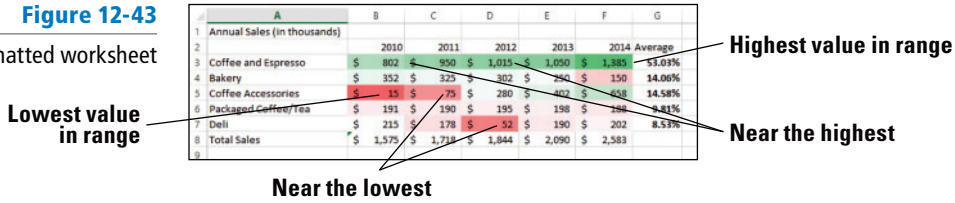
CERTIFICATION READY? 5.1.4

How do you use Quick Analysis to apply conditional formatting?

3. Click the **Color Scale** option to make this choice. Click in a cell outside the range so the formatting is clearer. The worksheet is formatted (see Figure 12-43) with the highest values in green with the highest value in dark green. The lowest values are in red.
4. If the value is close to the highest or lowest value, the color or the cell is less dark. As the values move away from the value, the color becomes lighter.

Figure 12-43

Formatted worksheet



5. SAVE and CLOSE the workbook.

PAUSE. LEAVE Excel open for the next exercise.

CREATING PIVOTTABLES AND PIVOTCHARTS

Bottom Line

A **PivotTable** report and **PivotCharts** are collaborative ways to quickly condense and rearrange large amounts of data. Use a PivotTable report to analyze and display the numerical data in detail and to answer unforeseen questions about your data. In this exercise, you will learn to create basic PivotTables.

A PivotTable report and Pivot Charts are especially designed for:

- Querying large amounts of data in many different ways.
- Subtotaling and gathering numeric data, summarizing data by categories and subcategories, and creating custom calculations and formulas.
- Expanding and collapsing levels of data to filter your results, and drilling down finer points from the summary data for areas of importance.
- Moving rows to columns or columns to pivot rows to examine different summaries of the data.
- Filtering, sorting, grouping, and conditionally formatting the most useful and interesting subset of data to enable you to focus on the information that you want.
- Providing concise, eye-catching, and interpreted online or printed information.

Creating a Basic PivotTable

PivotTable reports are used to examine and analyze related totals. Examples are calculating a long list of figures or comparing several facts about each piece of numerical data. In this exercise, you create a basic PivotTable report.

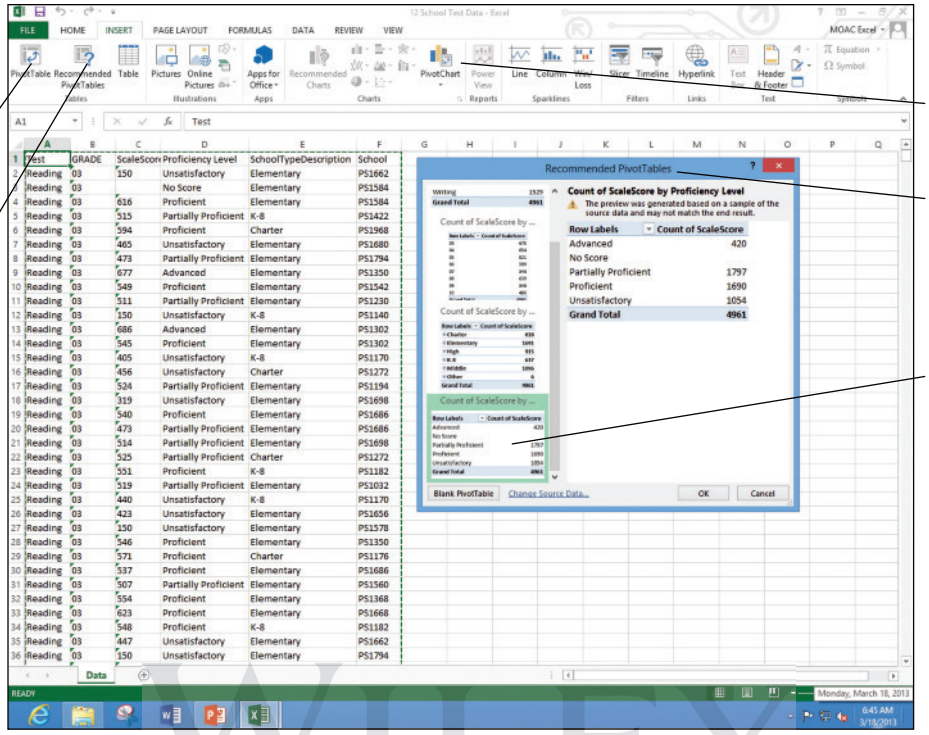
STEP BY STEP **Create a Basic PivotTable**

GET READY. OPEN ***12 School Test Data*** from the student data files.

1. Click cell **A1**. Press **End** and then press the **down arrow**. Notice that there are 139,129 rows of data.
2. Press **Ctrl + Home** to return to the top of the worksheet.
3. On the **INSERT** tab, click the **Recommended PivotTables** button.
4. Scroll to the bottom and click **Count of ScaleScore by Proficiency Level** (see Figure 12-44).

Figure 12-44

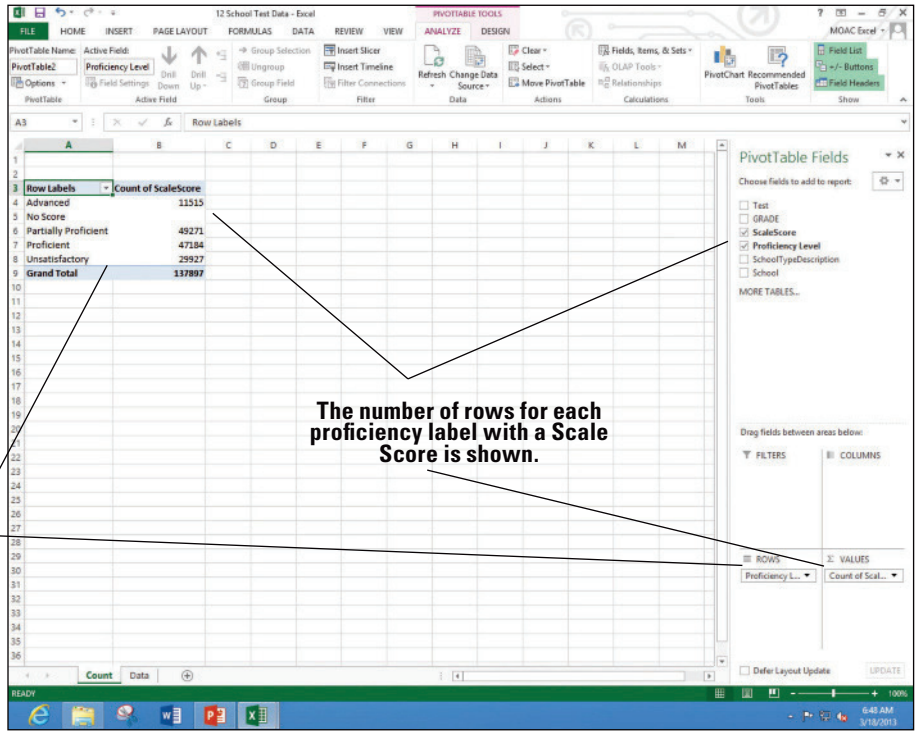
Recommended PivotTables dialog box



5. Click **OK** and **NAME** the new sheet **Count**. The PivotTable Fields pane opens on the right side of your screen and the data appears on the worksheet (see Figure 12-45). Notice that the data for No Score is blank. That is because the count of the rows is based on the Scale Score, which is empty for unavailable scores. You will want to change the field to count to a field that has data. If you look back on the Data tab, every row is filled by a grade so you can use this column so every row is counted.

Figure 12-45

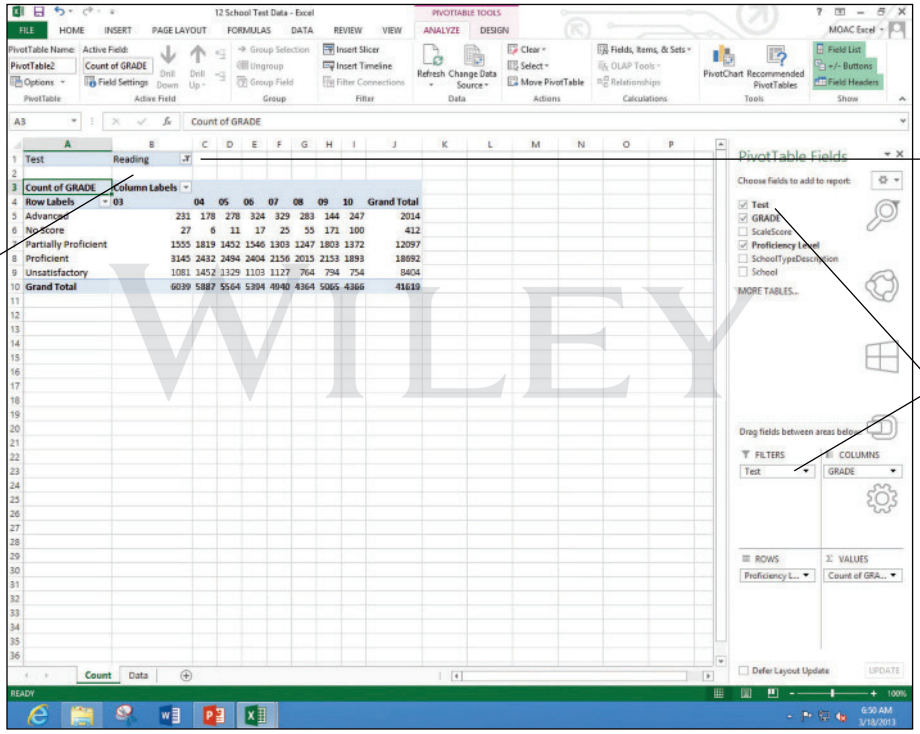
PivotTable Fields



6. Return to the Counts sheet and drag the **Grade** field in the PivotTable Fields pane down to the VALUES section.
7. Drag the **Count of ScaleScore** from the VALUES section into the worksheet to remove it. Notice that the No Score row now counts each missing score.
8. Drag the **Grade** field to the COLUMNS area. You'll see each grade summarized.
9. Drag the **Test** field to the FILTERS area.
10. Cell B1 currently shows *(All)*. Click the **Filter drop-down arrow,** choose **Math,** and click **OK**.
11. On the Filter button, click cell **B1** and choose **Reading**. Click **OK**. Your data should look similar to Figure 12-46.

Figure 12-46

Results of PivotTable



Take Note When you click any empty cell on the PivotTable, the Field list disappears. To make it reappear, you simply need to click on any active cell that is showing data.

12. SAVE the workbook to the Lesson 12 folder as ***12 Test PivotTable Solutions***.

PAUSE. LEAVE the workbook open for the next exercise.

After you create the initial PivotTable report by defining the data source, arranging fields in the PivotTable Field List, and choosing an initial layout, you can perform additional tasks as you work with and improve a PivotTable report, including:

- **Exploring the data:** Once initially created, you can expand and collapse data, and show the essential facts that pertain to the data. You can sort, filter, and group fields and data items. You can edit summary functions, and create custom calculations and formulas.
- **Changing the form layout and field arrangements:** You can edit the PivotTable report to display it in compact, outline, or tabular form. You can add, rearrange, and remove fields and also edit the order of the fields or items.
- **Change the layout of columns, rows, and subtotals:** Excel enables you to turn column and row field headers on or off, display or hide blank rows, display subtotals above or below their

rows, and adjust column widths on refresh. You also can move a column field to the row area or a row field to the column area, and merge or unmerge cells for outer row and column items.

- **Change the display of blanks and errors:** You can change how errors and empty cells are displayed, change how items and labels without data are shown, and display or hide blank lines.
- **Changing the format of the PivotTable:** You can apply manual and conditional formatting to cells and ranges, and you can edit the overall look by applying a PivotTable format style.

Take time to explore these options for PivotTables on your own.

Adding a PivotChart

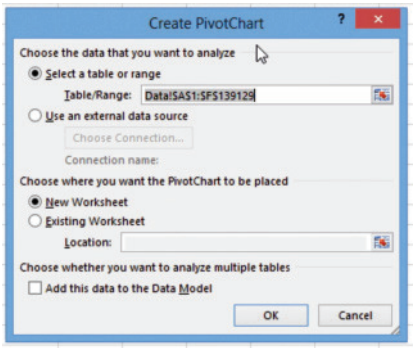
A **PivotChart** is an essential tool to help organize and arrange large amounts of data from worksheets. In addition to summarizing a huge amount of data, you can visualize the information in a simple graph.

STEP BY STEP — Add a PivotChart

GET READY. USE the workbook from the previous exercise.

1. On the **Data** worksheet, click cell **A1**.
2. On the **INSERT** tab, click the **PivotChart** button, and then choose **PivotChart**. The Create PivotChart dialog box opens and the range is selected (see Figure 12-47).

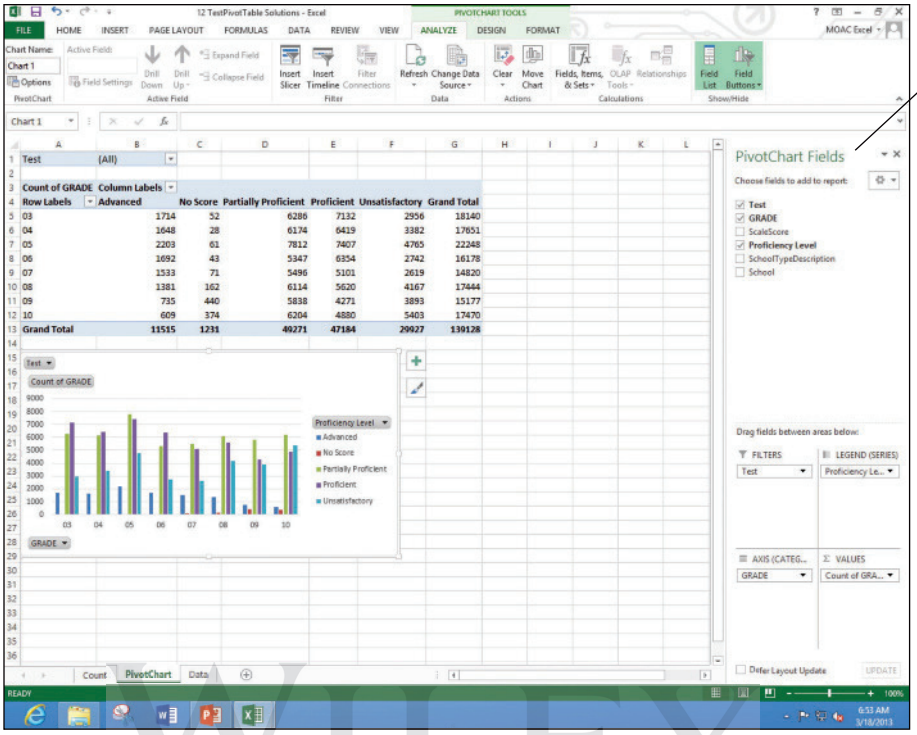
Figure 12-47
Create PivotChart dialog box



3. The default location is for a New Worksheet so click **OK**. Name the new sheet tab **PivotChart**.
4. Drag the **Test** field to the FILTERS area.
5. Drag **Grade** to the VALUES area (count number of items).
6. Drag **Grade** again to the AXIS area.
7. Drag **Proficiency Level** to the LEGEND area.
8. MOVE the chart to the left edge of the worksheet, below the data, and then resize the chart (see Figure 12-48).

Figure 12-48

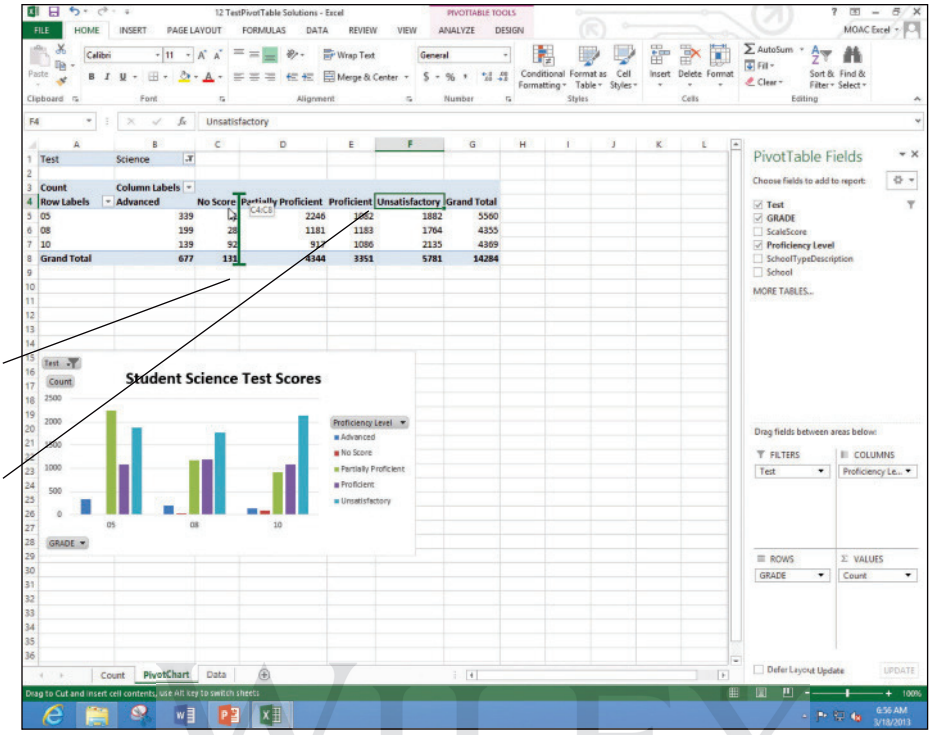
PivotChart of student test scores created



9. On the Test drop-down arrow on the chart, choose **Science** and click **OK**. Notice that only 5th, 8th, and 10th grades are available because only those grades take the Science test.
10. Click the **FORMAT** tab, click the **Text Box** button, and click the top of the chart. Add a label that says **Student Science Test Scores** and make this label **Bold** and **18** points.
11. Click cell **A3** and change the label to just say **Count**.
12. In F4, click on the label for **Unsatisfactory**.
13. Move the mouse pointer to the left edge of the cell until the mouse pointer changes to a four-headed black arrow and drag the mouse between columns C and D (see Figure 12-49).

Figure 12-49

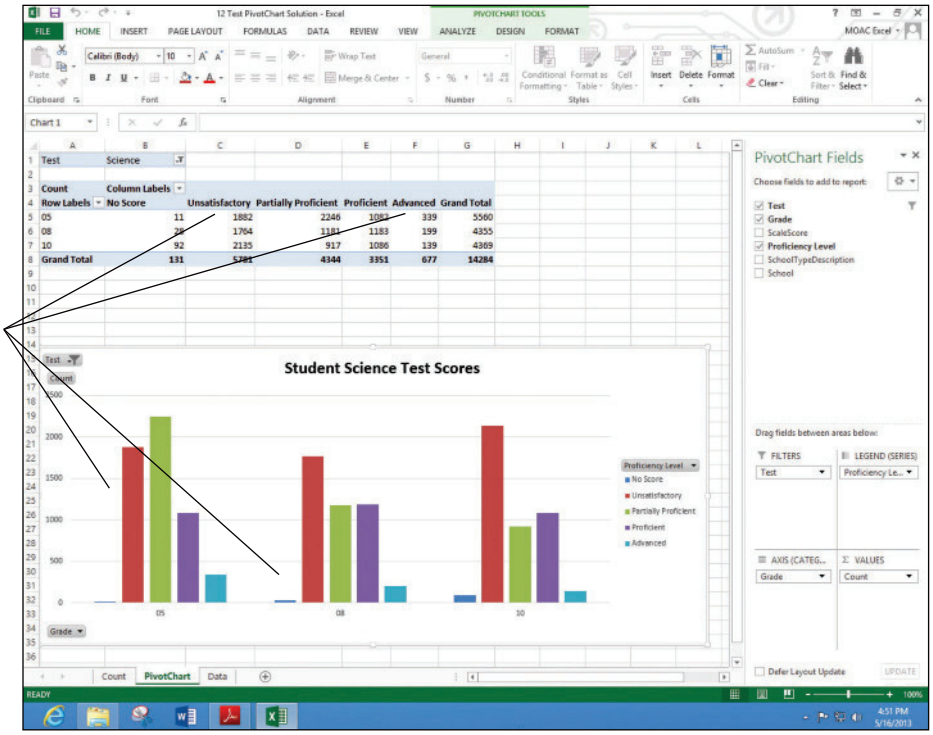
Drag Unsatisfactory to between No Score and Partially Proficient.



14. Repeat Step 13 and move the Advanced column to between Proficient and Grand Total.
15. Resize the PivotChart so it goes to column L.
16. SAVE the workbook as ***12 Test PivotChart Solution***. Your final sheet should look like that shown in Figure 12-50.

Figure 12-50

PivotChart completed



PAUSE. CLOSE the workbook and LEAVE Excel open for the next exercise.

SKILL SUMMARY

In this lesson you learned how to:	Exam Objective	Exam Number
Build charts	Create charts and graphs	5.1.1
Format a Chart with a Quick Style or Layout		
Format the parts of a chart manually	Add legends	5.2.1
	Modify chart and graph parameters	5.2.3
Modify a chart	Add additional data series	5.1.2
	Switch between rows and columns in source data	5.1.3
	Position charts and graphs	5.2.5
	Resize charts and graphs	5.2.2
	Apply chart layout and styles	5.2.4
Use new Quick Analysis Tools	Insert sparklines	2.3.2
	Demonstrate how to use Quick Analysis	5.1.4
Create PivotTables and PivotCharts		

Knowledge Assessment

Multiple Choice

Select the best response for the following statements.

1. Which chart type shows values as parts of a whole?
   a. Column
   b. Bar
   c. Area
   d. Pie
2. Which type of chart appears on a worksheet with other data?
   a. Chart sheet
   b. Embedded
   c. PivotChart
   d. Mixed
3. Which part of a chart do you click when you want to select the entire chart?
   a. Chart area
   b. Plot area
   c. Chart title
   d. Legend
4. Which of the following happens to a chart if the source data is deleted?
   a. Nothing.
   b. The chart will move to the area where the data was located.
   c. The data in the chart is deleted.
   d. You will be asked if you want the chart deleted.

5. Which is the first step that should be taken when creating a chart?
   a. Providing a name for the chart
   b. Selecting the chart type
   c. Selecting the range of cells that contain the data the chart will use
   d. Choosing the data labels that will be used in the chart
6. If you want to print only the chart in a worksheet, which of the following should you do before printing?
   a. Click the chart to select it and then print.
   b. Select the Print chart only option in the Page Setup dialog box.
   c. Move the chart to a new sheet by itself and then print that sheet.
   d. You cannot print only the chart if it is part of a larger worksheet.
7. A bar chart represents values as which of the following?
   a. Horizontal bars
   b. Vertical bars
   c. Horizontal lines
   d. Vertical lines
8. A column chart represents values as which of the following?
   a. Horizontal bars
   b. Vertical bars
   c. Horizontal lines
   d. Vertical lines
9. To move a chart from a worksheet to a chart sheet, perform which of the following?
   a. Use the move handles and drag it to the new location.
   b. Use the Move Chart button on the DESIGN tab.
   c. Cut the chart from the worksheet and paste it to a new workbook sheet.
   d. You cannot move the chart after it has been created.
10. Which of the following statements is not true?
   a. You can change both the height and width of a chart with commands on the FORMAT tab.
   b. You can use the sizing handles to change the height and width of a chart.
   c. You must delete an existing chart in order to have the data displayed in a different chart type.
   d. When a chart sheet is created, it no longer appears on the worksheet containing the data series.

Matching

Match each vocabulary term with its definition.

a. axis	_____	1.	A box that identifies the patterns or colors that are assigned to a data series or categories in a chart.
b. chart	_____	2.	A graphical representation of numeric data in a worksheet.
c. chart area	_____	3.	A bar, area, dot, slice, or other symbol in a chart that represents a single data point or value that originates from a worksheet cell.
d. chart sheet	_____	4.	A chart that is placed on a worksheet rather than on a separate sheet.
e. data label	_____	5.	A sheet in a workbook that contains only a chart.
f. data marker	_____	6.	The entire chart and all its elements.
g. data series	_____	7.	Related data points that are plotted in a chart.
h. embedded chart	_____	8.	A line bordering the chart plot area used as a frame of reference for measurement.
i. legend	_____	9.	Descriptive text that is automatically aligned to an axis or centered at the top of a chart.
j. title	_____	10.	A label that provides additional information about a data marker, which represents a single data point or value that originates from a worksheet cell.

Competency Assessment

Project 12-1: Create a Pie Chart

The Blue Yonder Airlines boss has asked you to do an analysis of your time for the past month.

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

1. CREATE the following workbook as shown in Figure 12-51. Use a SUM function in B9.

Figure 12-51
Data for pie chart

	A	B
1	Blue Yonder Airlines	
2	Monthly Time Analysis	
3	Labor Council Presentation	23.75
4	VP Staff Meetings	19.25
5	BOD Meetings	25.00
6	Terrorism Impact Analysis	75.00
7	Pilot Wages	25.00
8	Misc	12.75
9	Total	180.75
10		

2. Select A3:B8.
3. Click the INSERT tab. Click Pie and click 3-D Pie.
4. On the DESIGN tab, click Quick Layout and choose Layout 4.
5. Click the Move Chart button.
6. In the New Sheet box, type TimePie and click OK.
7. Click the CHART ELEMENTS button and check Chart Title.
8. For the selected Chart Title type Monthly Time Analysis.
9. SAVE the workbook to the Lesson 12 folder as *12 My Time Solution*.
10. CLOSE the workbook.

PAUSE. LEAVE Excel open for the next project.

Project 12-2: Create a Column Chart

Your friends have asked you to do a summary of salaries for selected occupations. You are going to meet as a group and discuss the pros and cons of each position. Salary is only one of the issues you will talk about, but it is significant.

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

1. CREATE the following workbook as shown in Figure 12-52.

Figure 12-52
Data for column chart

	A	B
1	Salaries for Entry Level Positions	
2		US
3	Accountant	44,911
4	Attorney	85,669
5	Biologist	44,116
6	Budget Analyst	49,420
7	Teller	23,112
8	Trader	44,472
9	Community Organizer	32,266
10	Database Analyst	56,284
11		

2. Select **A3:B10**.
3. Click the **INSERT** tab. Click **Column** and click **Clustered Column**.
4. Edit the chart title to read **Entry Level Salaries**.
5. Right-click in a blank area of the chart, choose **Move Chart**, and in the New sheet box, type **Salaries**. Click **OK**.
6. Right-click on the **Vertical** (Value) axis and select **Format Axis**.
7. In the Format Axis pane, choose **NUMBER** and in the Category drop-down, choose **Currency**.
8. SAVE the workbook to the Lesson 12 folder as ***12 Salaries Solution***.

PAUSE. LEAVE the workbook open for the next project.

Proficiency Assessment

Project 12-3: Convert and Modify a Chart

In the previous project, you created a column chart to display entry level salaries. In this project you will change the chart type, add data, and format the chart.

GET READY. USE the workbook from the previous exercise.

1. Click on **Sheet1**. In cell A11, type **Engineer** and in cell B11, type **57,894**.
2. Modify the chart to include row **11** .
3. Change the chart type to **Clustered Bar**.
4. Add a text box in the lower left corner to read **US Average (salary.com)**.
5. Change the bars using the **Green marble** Texture fill.
6. Change the Chart title to **Green Accent 6, Darker 50%**, and then apply **Bold**, **24 point**.
7. Drag the plot area up slightly so the text box you added in step 4 does not overlap the horizontal axis.
8. SAVE the workbook to the Lesson 12 folder as ***12 Salaries2 Solution***.
9. CLOSE the file.

PAUSE. LEAVE Excel open for the next project.

Project 12-4: Create a Radar Chart

In this exercise, you will plot the evaluations from three teachers to discuss your next semester schedule with your study group.

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

1. CREATE the workbook shown in Figure 12-53.

Figure 12-53

Data for radar chart

	A	B	C	D
1	Teacher Evaluations			
2		T1	T2	T3
3	Clear Presentation	83	76	46
4	Knowledgable	75	45	95
5	Available	100	48	45
6	Answered Questions	82	67	46
7	Stimulating	50	89	43
8	Encourage Participation	93	64	50

2. Create a **Radar** chart for the three teachers.
3. Move the chart to a sheet called **Evaluations**.
4. Change the Chart Title to read **Teacher Evaluations**.
5. Using the **CHART STYLES** button, change the chart to **Style 7**.
6. Move the legend to the bottom right of the chart.
7. Add a text box on the bottom left: **Fall Semester Evals**.
8. Change the text box font color to **gray** to match the other labels and make the font **italic**.
9. Decide which teacher you want and change the Legend so the teacher has an asterisk (*) after the number (on T1, T2, or T3).
10. SAVE the workbook to the Lesson 12 folder as ***12 Teachers Solution***.
11. CLOSE the file.

PAUSE. LEAVE Excel open for the next project.

Mastery Assessment

Project 12-5: Create Sparklines on a Worksheet

Your International Studies professor asked you to compare data from Gapminder about the changing number of years of education of women throughout the world.

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

1. OPEN the ***12 School International Women*** file for this lesson.
2. Create **Line** sparklines in column AP.
3. Change the sparklines to **Column**.
4. Identify the **High Point** on each sparkline.
5. Change both axes on each sparkline to **Same for All Sparklines**.
6. Type **Sparkline** in AP1.
7. Select **A2:AO176** and using the **Quick Analysis** button add an **Average** to the bottom of the chart.
8. Change the number of decimals in row 177 to **1 decimal**.
9. SAVE the workbook to the Lesson 12 folder as ***12 International Schooling Women Solution***.

PAUSE. LEAVE the workbook open for the next project.

Project 12-6: Create Line Charts

You've decided to continue the analysis of international women's education for your final paper. To prepare for your report you create several line charts of example countries from each part of the world.

GET READY. USE the workbook from the previous exercise.

1. CREATE a line chart of the average years of women's education for the world from 1970-2009.
2. Move the chart to a separate sheet and name the chart sheet **International Average** and title the chart **International Women's Education**. You do not need a legend since there is only one line.
3. Label only the vertical axis **Average Years of Education**.

4. Copy the chart 5 times and add data to compare the international average with a selected country. Use the following for the chart sheet name and data for each of the following countries:
   US
   Afghanistan
   Zimbabwe
   Taiwan
   Mexico
5. Change the chart title of each of the charts to read **[Country name] Women's Education**.
6. Add a legend to each of the charts in Step 4 to compare the country with the international average.
7. SAVE the workbook to the Lesson 12 folder as ***12 Women Final Solution*** and then CLOSE the file.

CLOSE Excel.