EXCEL

4

Data Visualization and Images

In this chapter, you will use a variety of ways to create visually interesting worksheets. You will learn when to create charts, which chart types to use for different situations, and how charts are particularly useful in understanding relationships among numbers in a worksheet. In this chapter, you will also learn about formatting data based on desired conditions and inserting pictures and shapes.

LEARNING OBJECTIVES

▸ Insert charts

▸ Use chart tools to modify charts

▸ Move and size charts

▸ Edit chart data

▸ Add images to a worksheet

▸ Apply conditional formatting

📂 Project: Reporting Company Sales Data

Airspace Travel has gathered data from six months of sales, and you need to create charts that will help visualize trends in the data. You have to decide what data to use to create the charts, and the chart types that will best help the company understand how it is performing. You want to show sales comparisons month by month, illustrate the contributions of each travel agent to compare them side by side, and highlight the top and bottom performers throughout the year.

Create Charts to Compare Data

There are many situations in which we are presented with numerical data, and it would be easier to interpret the data if we could visualize it in chart form. Charts are created from worksheet data. Similar to a formula, the data is linked so that if the data changes, the chart changes as well. Creating a chart is as easy as selecting the data and chart type. Excel does the rest! After the chart is created, you can add or modify chart elements to change the way your chart looks.

Chart Types

Excel has more than a dozen different types of charts to choose from, with variations of each chart type as well. However, it is important to remember that the purpose of a chart is to simplify data, not to make it more complicated. The most common options to use are a column or bar chart, a line chart, or a pie chart.

### Column Charts and Bar Charts

A column chart displays data in columns across the horizontal axis. A bar chart displays data in bars across the vertical axis. They are basically the same, except one is vertical and the other is horizontal. Column charts and bar charts are useful to compare data across several categories.
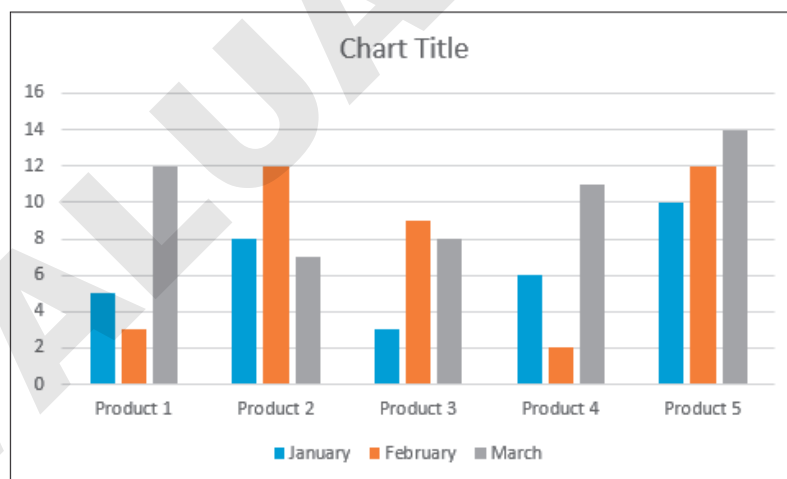

Line Charts

A line chart displays a series of data in a line or several lines and is useful for showing trends in data over time, such as days, months, or years. Line charts are best for a large amount of data and when

the order of data—for example, chronological—is important. Line charts are very similar to column charts and have most of the same features.
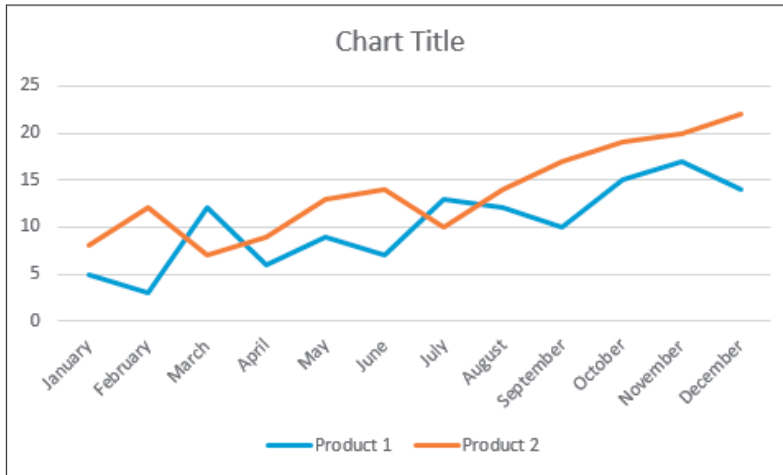
Pie Charts

A pie chart shows a comparison of data as parts of the whole. Pie charts are best for a small amount of data; too many pieces will be hard to see in a pie chart. Pie charts can contain only one series of data, and they do not have a horizontal or vertical axis like column and line charts.
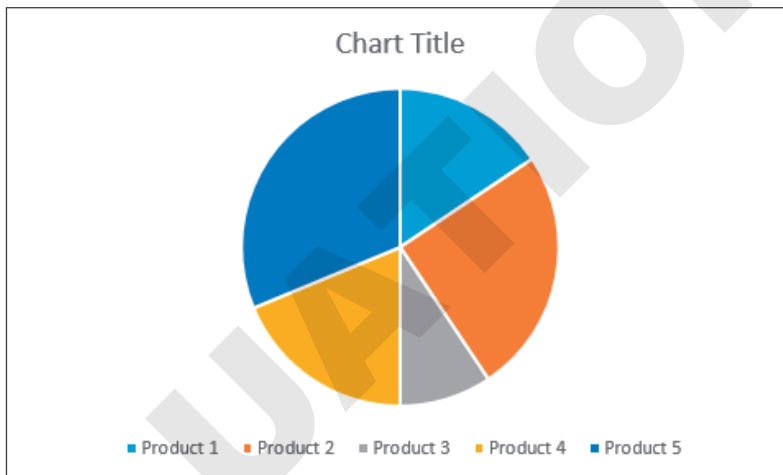
Excel also has a Recommended Charts option that will list the top chart options for you based on the data you have selected. The Insert Chart window shows a preview of what your chart will look like before you decide which one to use.

≡ Insert→Charts

≡ Insert→Charts→Recommended Charts 📊

Selecting Chart Data

Choosing the right data is very important to make sure Excel can create the chart correctly. The best method is to select the data and include the appropriate row and column headings. Select an equal number of cells in each row of data, even if some of those cells are empty.

You can create a column, bar, or line chart from the same selected data.

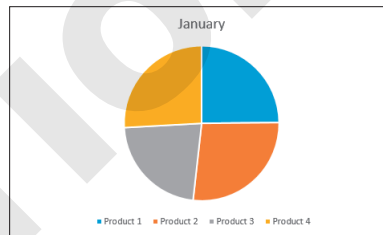| Q1 Revenue			
	January	February	March
Product 1	1200	1123	1150
Product 2	1301	1235	1260
Product 3	1080	1100	1120
Product 4	1250	1300	1275

The data, including row and column headings, is selected to create your chart.
Note that the blank cell in the top-left corner is also included.
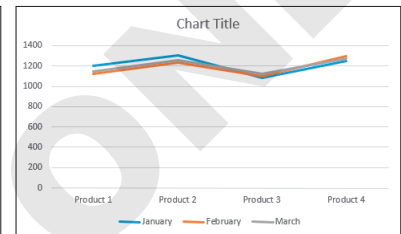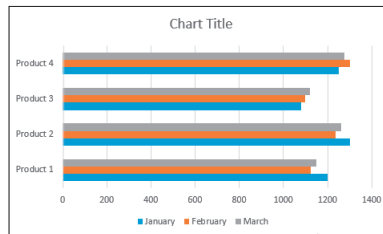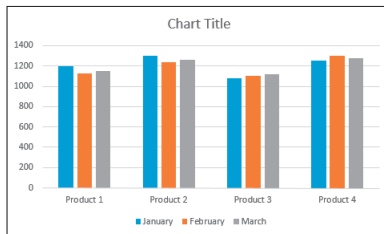
These three charts result from the same selection of data.

To create a pie chart, you can only select one data series.

Q1 Revenue			
	January	February	March
Product 1	1200	1123	1150
Product 2	1301	1235	1260
Product 3	1080	1100	1120
Product 4	1250	1300	1275

Only the January data series is selected to create this pie chart.

If you want to create charts showing only some of the data, use the [Ctrl] key to select the desired data.

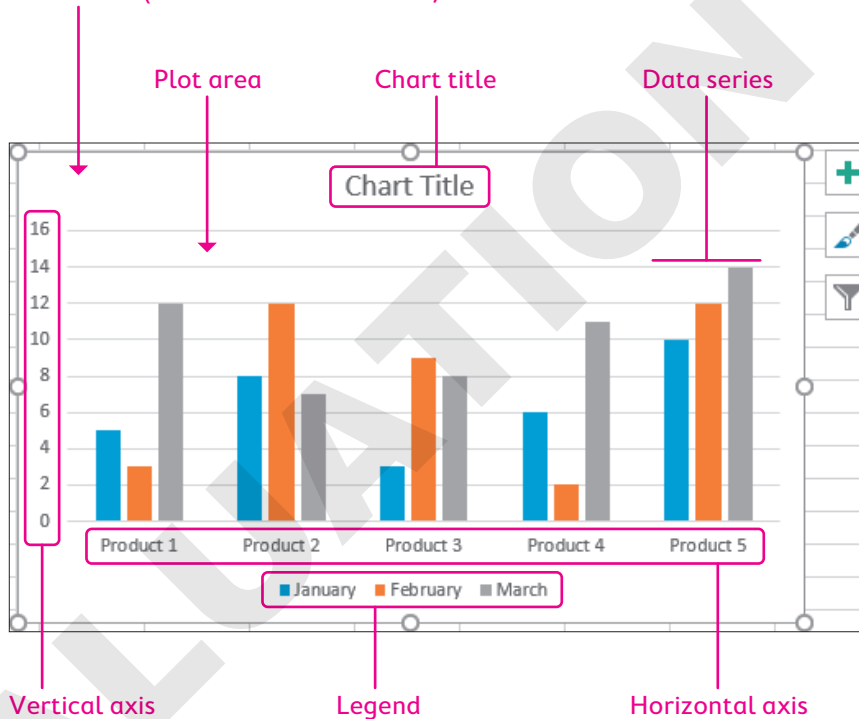| Q1 Revenue			
	January	**February**	**March**
Product 1	1200	1123	1150
Product 2	1301	1235	1260
Product 3	1080	1100	1120
Product 4	1250	1300	1275
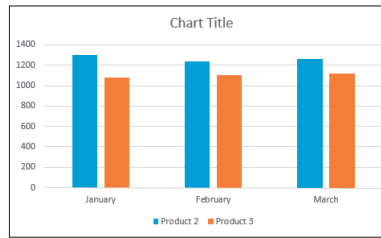
For a column, bar, or line chart showing only Products 2 and 3, you would select the three rows of data, including the blank cell.

Chart Elements

A chart is made up of different elements that can be added, removed, or modified. These elements can help others understand the information on the chart, or accentuate certain aspects of the data. There is a wide range of options for changing the look and style of your chart with each of the chart elements.

Chart area (the whole chart window, where the chart elements are located)

Plot area   Chart title   Data series

Vertical axis   Legend   Horizontal axis

Create Charts to Compare Data   **271**

DEVELOP YOUR SKILLS: E4-D1

In this exercise, you will select data and use it to create a chart.

1. Start Excel; open **E4-D1-Sales** from the **Excel Chapter 4** folder and save it as:
   E4-D1-SalesCharts

2. Follow these steps to insert a column chart:

- **A** Select the **range A3:D8** to compare the results for all agents for the first three months of the year.

- **B** Choose **Insert→Charts→Recommended Charts** from the Ribbon.

- **C** Excel recommends a clustered column chart. Click **OK** to insert the suggested chart.

Your chart will be inserted into your worksheet as a floating object, meaning it can be moved easily by dragging.

After creating your chart, notice that resting the mouse pointer over a chart element displays a ScreenTip with the name of that element and that pointing to your data will tell you the data series, point, and value.

3. Save the workbook.

Chart Tools

There are countless ways of formatting a chart; your chart can be as simple or as creative as you like. The way you format it will likely depend on your purpose and how much time you want to spend working on it. The chart tools are found on contextual tabs, meaning they are only available while a chart is selected. You can also use the Format pane on the right side of the screen to format chart elements. The formatting options change for each chart element.
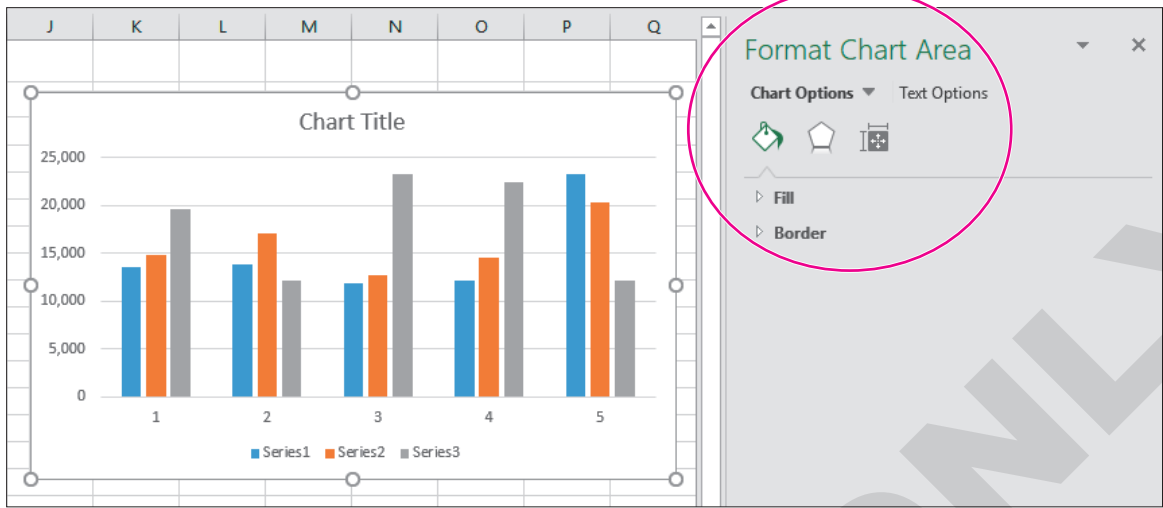
The formatting pane title and menu options change depending on what is selected in the worksheet. In this case, the chart area is selected so the Format Chart Area pane shows.

Chart Design Tools

You can use design tools to quickly and easily change the way your chart looks, using features like Chart Styles and Quick Layout. Styles modify the colors, shading, and layout of the various chart elements in one easy step. To change the appearance of a chart, there are many other design options, including changing the chart type, changing colors, or adding and removing various chart elements like chart titles, axis titles, data labels, and more.

⚠ View the Video "Using the Chart Design Tools."

The Chart Formatting Buttons

The chart formatting buttons can add elements to your chart, change the style, or filter the data visible on the chart.

One of the great features of Excel charts is the ability to filter data without changing the data selection or creating a new chart. You can simply filter the data to focus on the sets of data you want to compare and then add or remove the other series or categories as desired.
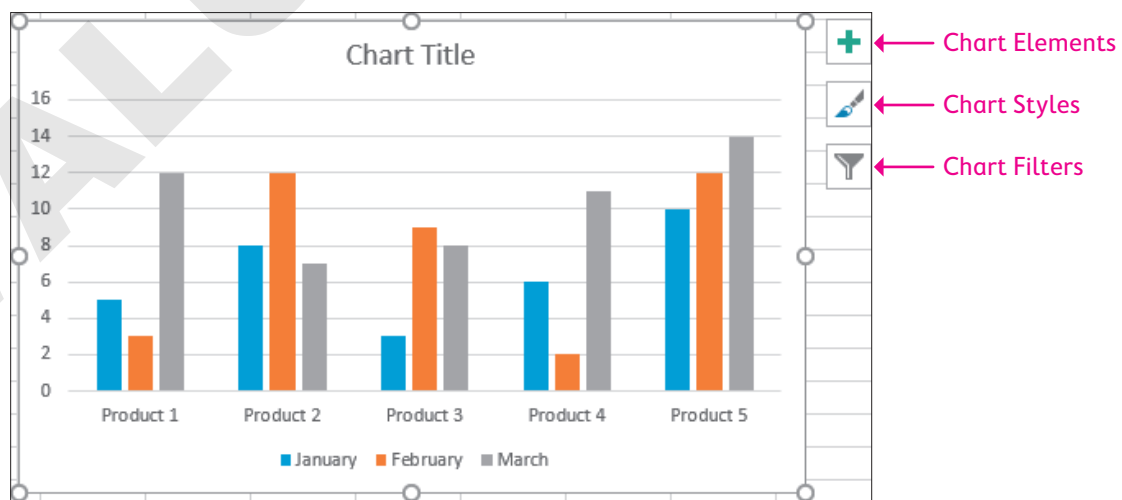

☰ Chart Tools→Design

EXCEL

Chart Tools **273**

DEVELOP YOUR SKILLS: E4-D2

In this exercise, you will adjust the appearance of your chart using the style, layout, and other chart design tools.

1. Save your workbook as: **E4-D2-SalesCharts**

2. If necessary, click anywhere on the column chart to select it and display the Chart Tools contextual tab on the Ribbon.

3. Choose **Chart Tools→Design→Chart Styles→Style 8** to apply the new style.

4. Choose **Chart Tools→Design→Chart Layouts→Quick Layout→Layout 1** to apply the layout, which moves the legend to the right side of the chart.

5. Follow these steps to add axis titles to your chart:
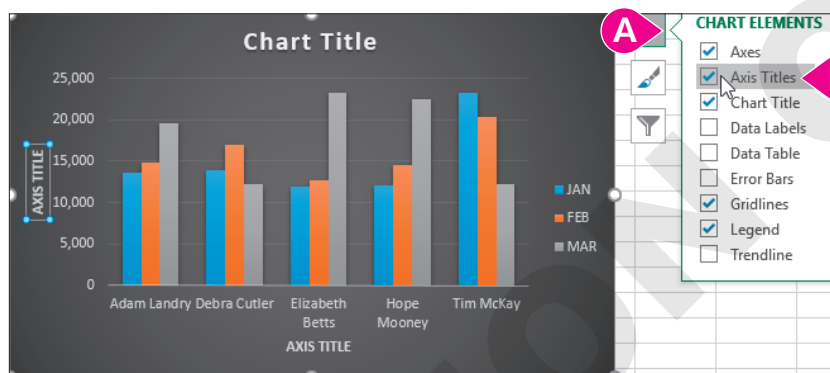
Ⓐ Click the **Chart Elements** ➕ button.

Ⓑ Click the checkbox beside **Axis Titles**.

6. Point to the title on the vertical axis, which you just added, and triple-click to select the entire text.

7. Type **Monthly Sales** for the axis title.

After entering an axis title, or a chart title, do not press ⟨Enter⟩. *Simply deselect the object or continue with the next task.*

8. Select the horizontal axis title and replace the text with: **Agent**

9. Change the chart title to: **Airspace Q1 Sales**

10. Follow these steps to change the chart type:

Ⓐ Click the **Change Chart Type** button on the Ribbon to open the dialog box.

Ⓑ Click the **Recommended Charts** tab.

Ⓒ Choose the second option, **Stacked Column**, and click **OK**.

This chart more clearly shows a comparison of the total for each agent during the three months, as well as the sales for each individual month.

11. Save the workbook.

Chart Format Tools

Beyond changing the basic style of a chart, you may want to choose your own colors for the chart area, plot area, or data series. This can be done by modifying the fill or outline of a specific chart element. The fill can be a color, gradient, texture, or even a picture. Other possibilities include adding shapes or WordArt to a chart.

Axis Options

Adjusting the axes can focus the chart on significant differences in the data, or simply change the appearance of the axes using number formatting, such as to display numbers as currency. One of the axis options is the minimum and maximum value displayed on the axis. For example, if the data you are charting all falls between 1,000 and 1,300, you can set your minimum to 1,000. This highlights the differences, because the first 1,000 units are the same for all the data points.
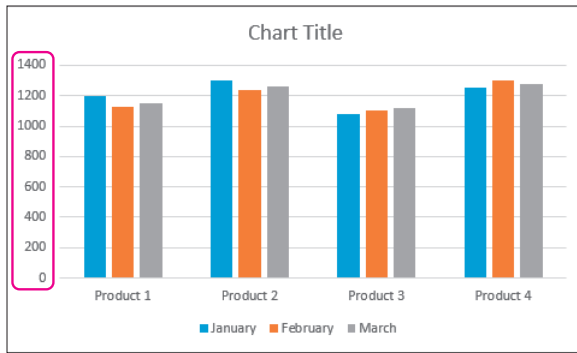
The data looks very similar with the axis values ranging from 0 to 1400.
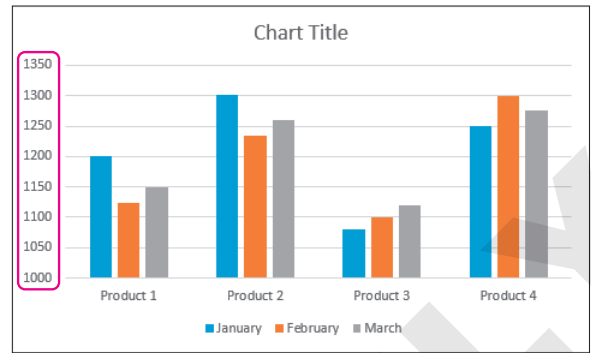
The product differences are much easier to see with the axis values starting at 1000.

≡ Chart Tools→Format→Current Selection→Format Selection 🖉 | Right-click axis→Format Axis

DEVELOP YOUR SKILLS: E4-D3

In this exercise, you will adjust the chart colors and axis numbering.

1. Save your workbook as: **E4-D3-SalesCharts**

2. Continuing with the Airspace Q1 Sales column chart, follow these steps to adjust the color of the FEB series:
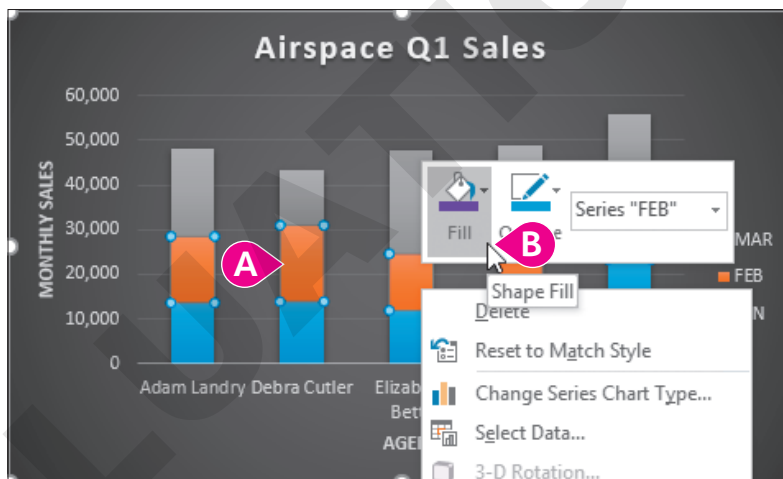
Ⓐ Click once on any orange block to select the FEB data series.

It's important to click only once. One click selects the whole series; clicking a second time would select only one data point from the series to modify.

Note! *You can see what's selected by the four corner circles. If only one data point is selected, deselect the series by clicking anywhere else, and try again to select all five orange columns.*

Ⓑ Right-click any of the selected orange data points, click **Fill** in the shortcut menu, and choose **Red** from the Standard Colors section.

3. Repeat step 2 to adjust the fill color for the MAR series to **Purple** (under Standard Colors).

4. Follow these steps to adjust the vertical axis:
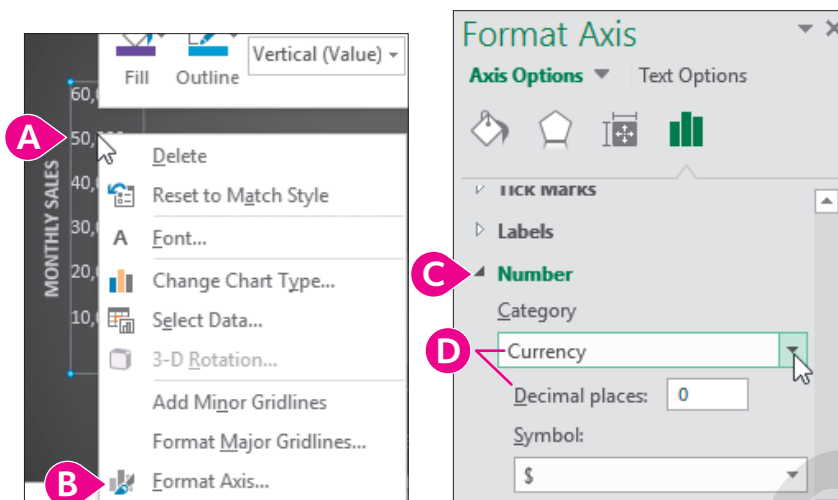
Ⓐ Point to a number on the vertical axis and then right-click to display the shortcut menu.

It is important to point to a number to get the right menu; if you are between the numbers, the Chart Area shortcut menu will appear, which has different options. Ensure the shortcut menu displays Format Axis at the bottom. If not, keep trying until you get it.

Ⓑ Choose the **Format Axis** command.

Ⓒ Scroll to the bottom of the Format Axis pane and click **Number** to expand the menu. (Depending on the size of your display, you may need to scroll down again to see the Number options.)

Ⓓ Choose **Currency** from the Category list using the menu button ▼ and, if necessary, change the decimal places to **0**.

The number format is changed for the vertical axis. You can either leave the Format Axis pane open or close it by clicking the "X" in the top-right corner.

5. Save the workbook.

Move and Size Charts

Charts can be moved around on a worksheet or moved to a different worksheet. A chart can be moved on the same sheet by simply dragging. Be sure, however, to click the chart area and not another chart element or you will only move that element and not the whole chart.

Because charts take up a lot of space, and you may want more than one chart in your workbook, it's often a good idea to move a chart onto a new, separate sheet. Charts that are moved onto their own sheet are referred to as chart sheets because they don't contain any rows, columns, or cells—just the chart itself. After moving a chart to a chart sheet, you can continue to work on the chart just like before.

To resize a chart, the chart must first be selected. Then you can drag any of the sizing handles to resize appropriately. You can also resize a chart from the Ribbon to specify the exact height and width. Charts on a chart sheet, however, can't be resized.

The mouse pointer over the chart area displays the four-pointed arrow; drag to move the chart.

Chart Title
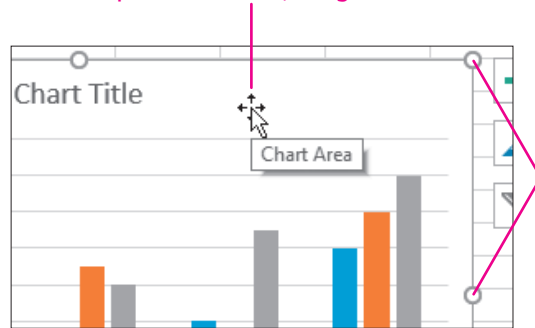
Chart Area

The sizing handles can be used to increase or decrease the chart size.

≡ Chart Tools→Design→Location→Move Chart │ Right-click chart area→Move Chart

≡ Chart Tools→Format→Size

DEVELOP YOUR SKILLS: E4-D4

In this exercise, you will move the existing chart and then create another chart and resize it.

1. Save your workbook as: **E4-D4-SalesCharts**

2. With the Airspace Q1 Sales chart selected, choose **Chart Tools→Design→Location→ Move Chart** to open the Move Chart dialog box.

   Remember, the chart must be selected to display the Chart Tools contextual tabs on the Ribbon.

3. Choose **New Sheet**, type **Q1 Sales** for the name of the worksheet, and click **OK**.

Move Chart	?	X

   Choose where you want the chart to be placed:

   ● New sheet: | Q1 Sales

   ○ Object in: | Sales

   OK   Cancel
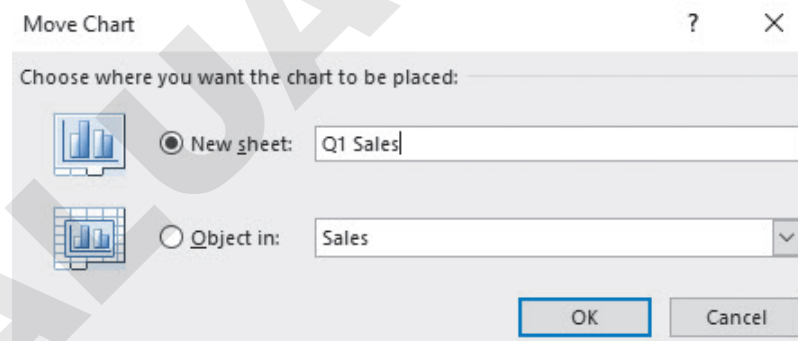
   This moves the chart to a chart sheet, which has no cells, and resizes the chart to fit your screen.

4. Click the **Sales** worksheet tab to create a new chart.

5. Select the **range A3:G6**, which contains the data for Adam, Debra, and Elizabeth.

6. Choose **Insert→Charts→Insert Line or Area Chart** 📈 **menu button** ▾→**Line** (the first option in the 2-D Line group).

7. Drag the chart so it is directly below the data.

8. Replace the chart title with the name: **Semiannual Sales**

9. Save the workbook.

Edit Chart Data

After a chart has been created, the data is linked, so if you change the data in the worksheet source, the chart is automatically updated. You can also add or remove data from the chart or filter the chart to change the data displayed. The easiest way to change the chart data is to reselect the entire range to be used, but you can also add or remove individual data series, points, or labels.

Rather than adding and removing data, sometimes a better option is to keep all existing data in the chart and use a filter to display only the data you want to see. The Chart Filters feature allows you to quickly filter specific series and category values and then remove the filter later to display all the data again.
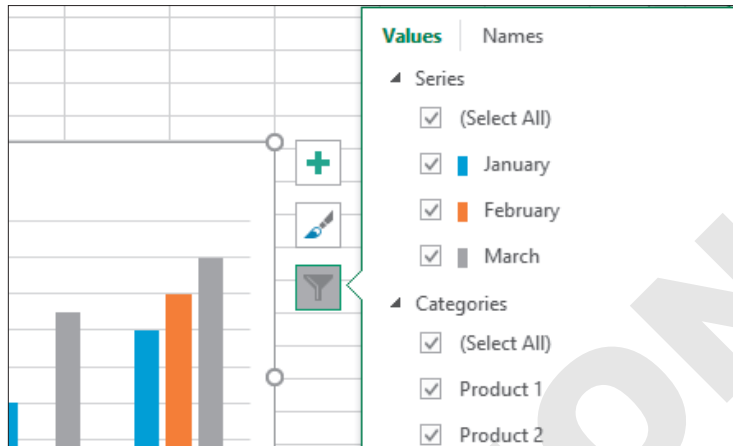
With the Chart Filter feature, you check the series and categories to display and uncheck the ones to hide.

Another way to rearrange your chart data is by swapping the Horizontal Axis and the Legend categories using the Switch Row/Column button. This allows different comparisons to be made, such as switching from comparing months side by side to product categories side by side, with one click.

≡ Chart Tools→Design→Data→Select Data

≡ Chart Tools→Design→Data→Switch Row/Column

DEVELOP YOUR SKILLS: E4-D5

In this exercise, you will edit the chart to include all five sales agents and then filter the data in the chart.

1. Save your workbook as: **E4-D5-SalesCharts**
2. Ensure the **Semiannual Sales** chart is still selected on the Sales worksheet.

3. Right-click anywhere in the chart and choose **Select Data** from the shortcut menu.

The Select Data Source dialog box appears. The current data range is selected and the corresponding cells on the worksheet are surrounded by an animated border.

	Agent	JAN	FEB	MAR	APR	MAY	JUN	Total
3								
4	Adam Landry	13,629	14,841	19,611	19,737	15,325	16,248	$99,391
5	Debra Cutler	13,904	17,040	12,207	9,044	18,848	13,322	$84,365
6	Elizabeth Betts	11,907	12,685	23,329	15,208	20,050	17,030	$100,209
7	Hope Mooney	12,083	14,490	22,446	12,670	16,211	15,581	$93,481
8	Tim McKay	23,272	20,287	12,161	21,237	16,247	11,548	$104,752

Select Data Source   ?   ✕

Chart data range: =Sales!$A$3:$G$6

4. Drag across the worksheet **range A3:G8** to select the new data and click **OK**.

	Agent	JAN	FEB	MAR	APR	MAY	JUN	Total
3								
4	Adam Landry	13,629	14,841	19,611	19,737	15,325	16,248	$99,391
5	Debra Cutler	13,904	17,040	12,207	9,044	18,848	13,322	$84,365
6	Elizabeth Betts	11,907	12,685	23,329	15,208	20,050	17,030	$100,209
7	Hope Mooney	12,083	14,490	22,446	12,670	16,211	15,581	$93,481
8	Tim McKay	23,272	20,287	12,161	21,237	16,247	11,548	$104,752

Select Data Source   ?   ✕

Chart data range: =Sales!$A$3:$G$8

The new data displays five lines in the chart, one for each of the five agents.

5. Click the **Chart Filters** ▼ button and click the checkboxes next to **Adam**, **Elizabeth**, and **Tim** to remove the checks and filter out their data; then click **Apply**.

You should now see only Debra's and Hope's data on the chart and only their names in the legend.

6. Change the number format for the vertical axis to display the **Currency** number format with no decimals.

7. Save the workbook.

Adding Images

For the most part, Excel is used for text and numerical data; however, it is also possible to add pictures and shapes to a worksheet. Pictures might be used to display a company logo, add information to a spreadsheet, or simply bring a little excitement to an otherwise plain set of data. Pictures can be added from your computer or from an online search, and many types of shapes can be added via the menu button. Text boxes can be added for easier formatting and positioning of graphical text on a worksheet.

Adding a picture lets you access the Picture Tools tab on the Ribbon, and adding a shape allows you to access the Drawing Tools tab. Both of these contextual tabs give you a great number of options for changing the style, shape, color, and size of the object, and for modifying many other aspects as well.

Add pictures you have saved on your computer.

Choose from a variety of shapes and callouts in the shapes library.

Insert pictures from OneDrive or Bing (Microsoft's search engine that lets you browse an endless supply of images from the Internet).
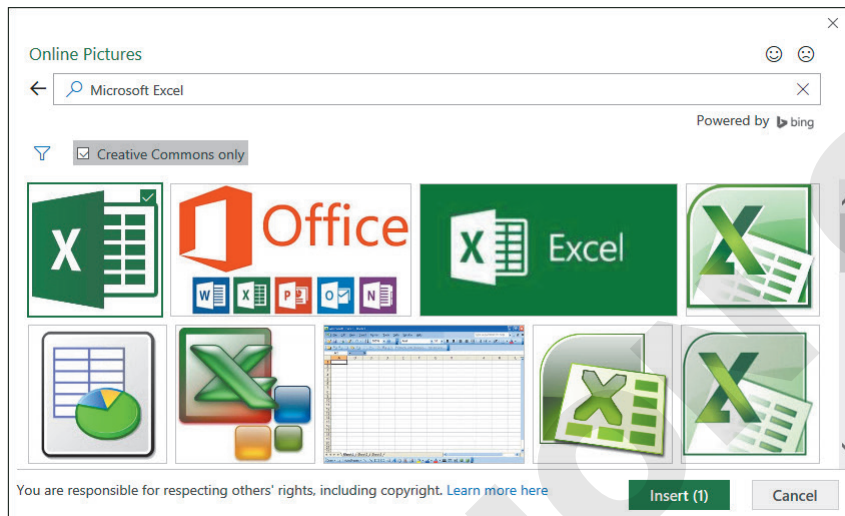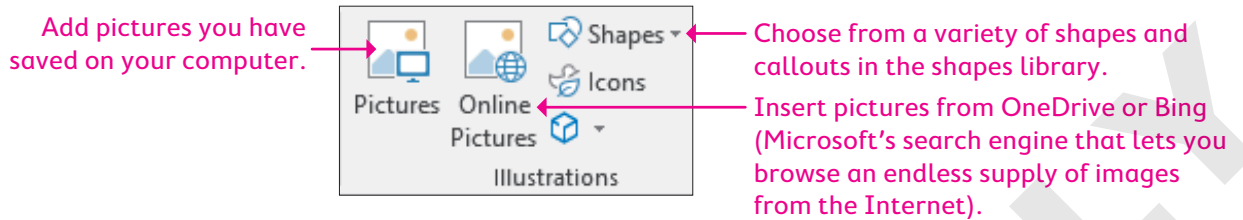
Using Online Pictures to do a Bing search for *Microsoft Excel* returns many variations of the Excel logo.

When searching online you may find pictures that are protected by copyright. It is important to ensure you respect copyright laws. By default, the online picture search in Excel displays only pictures licensed under Creative Commons, meaning you can use these pictures freely.

≡ Insert→Illustrations→Pictures *or* Online Pictures *or* Shapes

≡ Insert→Text→Text Box

≡ For pictures: Picture Tools→Format │ For shapes: Drawing Tools→Format

DEVELOP YOUR SKILLS: E4-D6

In this exercise, you will add a picture to the worksheet and make some modifications to the picture.

1. Save your workbook as: **E4-D6-SalesCharts**
2. Select **cell J1** on the **Sales** sheet and then choose **Insert→Illustrations→Online Pictures** 🖼 to open the dialog box.
3. Search for **air travel** in the search box, choose a suitable image (perhaps a plane with a globe), and then click **Insert**.

   Because this is an online search, the results change frequently and you may not see the same images from one search to the next. Some online images are also inserted with licensing information, which refers to the creative commons license to use the image.

4. With the image selected (if your picture includes licensing information, select only the picture), go to **Picture Tools→Format→Size→Height** 📏, type **1** in the box, and tap Enter.

5. Select **cell I1** and choose **Insert→Illustrations→Online Pictures** 🖼 again.

6. Enter `space` in the search box, choose an appropriate image of a spaceship, and click **Insert**.

7. Resize this image to be **1"** in height to match the first image.

8. Choose **Picture Tools→Format→Adjust→Color→Blue, Accent Color 1 Light** (in the Recolor group).

9. Save the workbook.

Conditional Formatting

Another way to better visualize your data is to use conditional formatting. Conditional formatting takes a set of data, applies a rule or rules, and modifies the formatting of the cells that match the rule. For example, you may have a large set of data containing student grades and want to quickly find the top three marks. Or you may have sales data for a group of products and want to find which product sells the most and which one sells the least. Conditional formatting applies formatting of your choice to the cells that meet these criteria so you can quickly find them.

Rules can be created to draw attention to the top or bottom, or to numbers greater than or less than a specific number. You can also highlight a cell with a number equal to a specific amount or a cell that contains certain text. Other conditional formatting can be applied to all the selected cells, including data bars, color scales, and icon sets, which are useful for visualizing a set of data as a group. There are so many options!

To apply conditional formatting, the first step is always to select the entire range of data to apply the rule to. For conditional formatting, unlike with charts, you do not include any labels and generally don't include any totals unless you set up a separate rule for total rows or columns. Different rule options are available from the Conditional Formatting drop-down menu, but the criteria and formatting can also be modified to suit your needs. After a rule has been created, you can delete the rule using Clear Rules. Select Manage Rules to see all of the existing rules for either the current selection or the entire worksheet.

	A	B	C	D
1		January	February	March
2	Product 1	5	3	12
3	Product 2	8	12	7
4	Product 3	3	9	8
5	Product 4	6	2	11
6	Product 5	10	12	14

The worksheet before creating conditional formatting, with the range selected

	A	B	C	D
1		January	February	March
2	Product 1	5	3	12
3	Product 2	8	12	7
4	Product 3	3	9	8
5	Product 4	6	2	11
6	Product 5	10	12	14

The worksheet after the conditional formatting rule is applied to the range, showing the top five items with a light red fill and dark red text

Note! *When a conditional formatting rule is created for the top five items, if two or more items are tied for fifth highest, six or more items could be included in the conditional formatting.*

View the Video "Highlighting Data with Conditional Formatting."

After a conditional formatting rule is created, the formatting is automatically updated to reflect the new data if it changes.

≡ Home→Styles→Conditional Formatting 🖩

DEVELOP YOUR SKILLS: E4-D7

In this exercise, you will alter the appearance of the data using conditional formatting to show some of the top and bottom sales numbers for the agents.

1. Save your workbook as: **E4-D7-SalesCharts**
2. Select the **range B4:G8** and choose **Home→Styles→Conditional Formatting** 🖩→ **Highlight Cells Rules→Greater Than…**.
3. In the Greater Than dialog box, type **20000** in the first box (that's 20,000 with no comma).

    The preview shows which data this will apply to, with the default format.

4. Click **OK** to apply the default format and close the dialog box.

    For the six-month total, you want to see the top and bottom agents, so you will apply two new rules to the data in column H under Total.

5. Select the **range H4:H8** and choose **Home→Styles→Conditional Formatting→ Top/Bottom Rules→Top 10 Items…**.
6. In the dialog box change the *10* to **1** and set the format to **Green Fill with Dark Green Text**; click **OK**.
7. With the **range H4:H8** still selected, choose **Home→Styles→Conditional Formatting→ Top/Bottom Rules→Bottom 10 Items…**.
8. Change the *10* to **1** and select the **Yellow Fill with Dark Yellow Text** format; then click **OK**.

    Now the data needs to be updated. A sale was missed for Debra in March, so the number should be higher.

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9. Select **cell D5** and increase the number *12,207* by entering **22207**

The formatting for cell D7 changes to red fill and red text because it is greater than 20,000. The formatting in the Total column also changes because Debra no longer has the lowest total, and your Semiannual Sales chart below the data updates as well.

	A	B	C	D	E	F	G	H
1				**Airspace Travel Company**				
2				**Agent Sales by Month**				
3	**Agent**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**Total**
4	**Adam Landry**	13,629	14,841	19,611	19,737	15,325	16,248	$99,391
5	**Debra Cutler**	13,904	17,040	22,207	9,044	18,848	13,322	$94,365
6	**Elizabeth Betts**	11,907	12,685	23,329	15,208	20,050	17,030	$100,209
7	**Hope Mooney**	12,083	14,490	22,446	12,670	16,211	15,581	$93,481
8	**Tim McKay**	23,272	20,287	12,161	21,237	16,247	11,548	$104,752

Semiannual Sales

(Line chart showing Debra Cutler and Hope Mooney sales across JAN–JUN, with y-axis from $0 to $25,000.)

Q1 Sales   **Sales**   (+)

10. Save the workbook and close Excel.

Self-Assessment

Check your knowledge of this chapter's key concepts and skills using the Self-Assessment in your ebook or eLab course.

📌 Reinforce Your Skills

REINFORCE YOUR SKILLS: E4-R1

Create and Modify Charts

In this exercise, you will create several charts to compare volunteer hours for the Kids for Change volunteers and then make some changes to the charts.

1. Start Excel; open **E4-R1-VHours** from your **Excel Chapter 4** folder and save it as:
   E4-R1-VHoursSummary

2. Select the **ranges A4:A10** and **N4:N10**.

   Remember to use the ⎡Ctrl⎤ button to select nonadjacent ranges.

3. Choose **Insert→Charts→Recommended Charts** 📊.

4. Select the third option, the **Pie** chart, and click **OK**.

5. Edit the chart title from *Total* to: **Annual Total**

6. Move the chart to its own sheet, naming it: **Hours by Volunteer**

7. Return to the **Summary** sheet and select the **ranges A4:M4** and **A11:M11**.

8. Choose **Insert→Charts→Insert Line or Area Chart** 〽️ **menu button** ▼ →**3-D Area** (the first option on the bottom row in the 3-D Area group).

9. Edit the chart title from *Total* to: **Monthly Total**

10. Click on the chart area and then click the **Chart Elements** ➕ button.

11. Hover the mouse over *Axes*, and you will see a menu button ▸ appear; click it to expand the options.
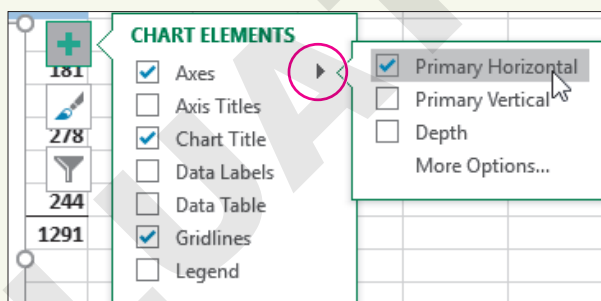
12. Uncheck the boxes beside **Primary Vertical** and **Depth** to remove those axes from the chart.

    Options for fill, besides simple colors, include picture, gradient, and texture, which you can find in the shortcut menu below the color palette. Now you will apply a texture fill.

13. Right-click the data series and change the fill to **Texture→Purple Mesh**.

14. Modify the chart area to a solid fill color using **Blue-Gray, Text 2, Darker 50%** (under Theme Colors).

15. Move the chart to its own sheet, naming it: **Hours by Month**

16. Go to the **Hours by Volunteer** sheet and change the Annual Total chart type from a pie chart to **3-D Clustered Bar**.

17. Change the layout to **Layout 5**, which includes a data table below the chart.

18. Save the workbook.

Format Charts and Add Conditional Formatting

In this exercise, you will make some further changes to your charts and then add conditional formatting rules to your data.

1. Save your workbook as: **E4-R2-VHoursSummary**
2. Go to the **Hours by Month** sheet and select the **Horizontal Axis**.

   Simple formatting changes—such as altering the font size or type, or adding bold formatting—can be done right from the Home tab, which you will use for the following step.

3. Increase the font size of the horizontal axis to **12**, then right-click it and choose **Format Axis**.
4. Click to select **Text Options**. Expand the Text Fill options, if necessary, and change the color to solid fill **White, Background 1**.

   Keep the Format pane open.

5. Select the chart title and change the text fill to **White, Background 1**, and then close the Format pane.
6. Use the **Chart Filters** button to remove the first six months from the chart, leaving only the data for July to December.
7. Go back to the **Summary** worksheet and select the **range B5:M10**.
8. Apply a conditional formatting rule that highlights cells containing a number greater than **29** with **Light Red Fill with Dark Red Text**.
9. Select the **range N5:N10**.
10. Apply a conditional formatting rule to show the top three cells with **Green Fill with Dark Green Text**.
11. Select the **range B11:M11** and apply a conditional formatting rule to show the top three cells with **Green Fill with Dark Green Text**.
12. Save and close the workbook.

Add Visual Aids for a Financial Summary

In this exercise, you will use data from the Kids for Change summer fundraising campaign results as you create and edit charts, add pictures, and use conditional formatting.

1. Start Excel; open **E4-R3-SummerFunds** from your **Excel Chapter 4** folder and save it as: **E4-R3-SummerFundsResults**
2. Select the **range A4:D8** and insert a **2-D Clustered Column** chart.
3. Change the chart style to **Style 8**.
4. Modify the chart area to a **Dark Blue** fill color.
5. Change the June Series fill to **Purple** and the July Series fill to **White, Background 1**.
6. Change the chart title to: **Results**
7. Move the chart to a new sheet also named: **Results**

8. Go back to the **Summary** sheet and select the **ranges B4:D4** and **B9:D9**.

9. Insert a **3-D Pie** chart and then remove the title and the legend elements.

10. Move the chart as an object into the existing **Results** sheet.

11. Remove the chart area fill from the pie chart you just moved (choose **Fill** and then **No Fill**) and then remove the border in the same way (**No Line**).

    While working on the chart, the chart is outlined, which prevents you from seeing the change; you won't see that the border is removed until the chart is deselected.

12. Change the June Series fill to **Purple** and the July Series fill to **White, Background 1**.

13. Move the pie chart to the top-right corner of the column chart and change the size to **2.5" tall**.

    The pie chart now shows the totals from each of the categories in the column chart below.

14. Edit the vertical axis of the column chart to be **Currency** format with no decimal places, apply bold formatting, and increase the font size to **10 pt**.

15. Edit the horizontal axis formatting to match the vertical axis (bold text with 10-pt font size).

16. Increase the font size of the title to **20 pt**.

17. Go back to the **Summary** sheet and create a conditional formatting rule that will apply a red fill and font color to the top three numbers in the **range B5:D8**.

18. Insert two online pictures, first searching for pictures of *running* and then for *barbecue*. Choose the ones you like the best and insert the images below the data.

19. Resize both images to **0.75" tall** and reposition as necessary so they are roughly centered below the data (if your inserted images include licensing information, you can safely delete it for the purposes of this exercise).

20. Save the workbook and close Excel.

<div style="text-align: right">EXCEL</div>

✎ Apply Your Skills

APPLY YOUR SKILLS: E4-A1

Create Charts and Use Chart Tools

In this exercise, you will use the revenue and expense data for Universal Corporate Events to create two charts, and then edit the charts.

1. Start Excel; open **E4-A1-Profit** from your **Excel Chapter 4** folder and save it as:
   E4-A1-ProfitSummary
2. On the **Profit Q1&Q2** sheet, select the **ranges A6:G6** and **A10:G13** and insert a **2-D Clustered Column** chart.
3. Change the chart layout to **Layout 11**.
4. Choose **Chart Tools→Design→Data→Switch Row/Column** to switch the months to the legend and the categories to the horizontal axis.
5. Choose **Chart Tools→Design→Chart Styles→Change Colors→Monochromatic Palette 4** to make all series different shades of blue.
6. Change the chart style to **Style 8**.
7. Move the chart to a new sheet named: **Expenses**
8. Go back to the **Profit Q1&Q2** sheet and select the **range A6:G7**.
9. Insert a **2-D Line** chart and adjust the style and colors to **Monochromatic Palette 4** and **Style 7**.
10. Move the chart to a new sheet named: **Revenue**
11. Adjust the vertical axis format to display the minimum value as **15,000** rather than zero.
12. Remove the chart title from the **Revenue** chart.
13. Save the workbook.

APPLY YOUR SKILLS: E4-A2

Apply Conditional Formatting Rules

In this exercise, you will use conditional formatting rules to identify the month with the highest revenue or expense for each category.

1. Save your workbook as: **E4-A2-ProfitSummary**
2. If necessary, go to the **Profit Q1&Q2** sheet.
3. Select the **range B7:G7** (the six months of revenue data in row 7); do not include the total.
4. Create a conditional formatting rule to format the TOP 1 cell with **Red Text**.
5. Select the cells with the six months of employee wage data in row 10 and, again, create a conditional formatting rule to format the TOP 1 cell with **Red Text**.

   Because the numbers are identical, the formatting applies to all of them.
6. Repeat this process five more times, one time for each of the rows of data for capital expenditures, material costs, marketing and sales, total expenses, and profit/loss.

7. Select **cell D17** and insert a picture of an up arrow using an **Online Picture**.

8. Resize the inserted picture to **1" tall**.

9. Save and close the workbook.

APPLY YOUR SKILLS: E4-A3

Create Visual Tools for a Financial Forecast

In this exercise, you will create and modify a chart displaying the long-term financial forecast for Universal Corporate Events.

1. Start Excel; open **E4-A3-LTForecast** from your **Excel Chapter 4** folder and save it as:
   E4-A3-5yrForecast

2. Create a **3-D Column** chart using the revenue and expense data for all five years. (Be sure to include the year headings.)

3. Change the fill for Revenue to **Gold, Accent 4** and for Expenses to **Standard Dark Red**.

4. Remove the chart title completely.

5. Move the chart so it is directly below Profit/Loss in **row 8** and roughly centered below the data.

6. Edit the chart data to include the profit/loss data in **row 8**.

7. Change the chart type to a **Clustered Column – Line** combo chart; also ensure that Revenue and Total Expenses are each a **Clustered Column** chart and Profit/Loss is a **Line** chart.

8. Right-click the line for Profit/Loss and change the outline color to **Dark Blue** (under Standard Colors).

9. Edit the number formatting for the vertical axis to **Currency** format with no decimals.

10. Create a conditional formatting rule to show the Profit/Loss cells that are greater than **$100,000** with **Yellow Fill with Dark Yellow Text**.

11. Insert the **UniversalCorporateEvents.jpg** logo file from the **Excel Chapter 4** folder in **cell E1** to the right of the sheet title and resize the logo to **1" tall**.

12. Save the workbook and close Excel.

EXCEL

Project Grader

If your class is using eLab (labyrinthelab.com), you may upload your completed Project Grader assignments for automatic grading. You may complete these projects even if your class doesn't use eLab, though you will not be able to upload your work.

PROJECT GRADER: E4-P1

Analyzing Item Sales Performance

Taylor Games is growing fast and adding more items to its inventory. In this exercise, you will use conditional formatting, charts, and other Excel features to help identify the best performing items.

1. Download and open your Project Grader starting file.
   - *Using eLab:* Download **E4_P1_eStart** from the Assignments page. You *must* start with this file or your work cannot be automatically graded.
   - *Not using eLab:* Open **E4_P1_Start** from your **Excel Chapter 4** folder.
2. Insert the **Taylor Games Logo.png** picture from your **Excel Chapter 4** folder.
3. Change the picture's height to **1"**, allowing the width to adjust to the new height. If necessary, move the picture to the top-left corner of the worksheet.
4. For the **range I8:I22**, apply **Green Data Bar (Gradient Fill)** conditional formatting.
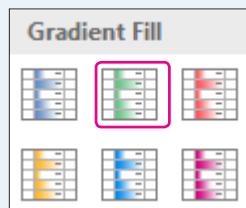
5. Use these settings to apply conditional formatting to the **range H8:H22**:
   - Use **Top 10%** from the Top/Bottom rules category.
   - Change the percentage to **25%** in the dialog box that appears.
   - Leave the color option set to **Light Red Fill with Dark Red Text**.
6. Create a 2-D pie chart using the **ranges A8:A22** and **H8:H22**.
7. Move the chart to a new sheet named: `Replacement Pieces`
8. Change the chart title to: `Replacement Pieces Annual Units`
9. Change the chart style to **Style 3**.
10. Apply a chart filter that only displays items that are **Replacement** pieces.
11. Format the data labels to show only **Category Name** and **Value**.
12. Move the **Replacement Pieces** sheet to the right of the Distributor Sales sheet.
13. In the **Distributor Sales** sheet, create a 2-D clustered bar chart using the ranges **A8:A22** and **I8:I22**.
14. Move the chart to a new sheet named: `Revenue by Item`
15. Change the chart title to: `Revenue by Item`

16. Move the **Revenue by Item** sheet to the end of the sheet order (to the right of the Replacement Pieces sheet).

17. Save your workbook.

- *Using eLab:* Save it to your **Excel Chapter 4** folder as **E4_P1_eSubmission** and attach the file to your eLab assignment for grading.
- *Not using eLab:* Save it to your **Excel Chapter 4** folder as: **E4_P1_Submission**

PROJECT GRADER: E4-P2

Analyzing Car Brands and Ages

The Classic Cars Club management team wants a chart of the brand and age of the members' cars. In this exercise, you will address their needs by using pie charts to display the needed information.

1. Download and open your Project Grader starting file.
   - *Using eLab:* Download **E4_P2_eStart** from the Assignments page. You *must* start with this file or your work cannot be automatically graded.
   - *Not using eLab:* Open **E4_P2_Start** from your **Excel Chapter 4** folder.

2. In the **Membership List** worksheet, insert the **Classic Cars Logo.png** picture from your **Excel Chapter 4** folder.

3. Change the picture's height to **1"**, allowing the width to adjust to the new height. If necessary, move the picture to the empty cells above the header row and to the right of the title and subtitle.

4. For the **range H7:H36**, apply conditional formatting that highlights all cells in which the term is 5 years with a green fill and dark green text.

5. In the **Brands & Ages** worksheet, create a 3-D pie chart using the ranges **A4:A11** and **C4:C11**.

6. Change the chart style to **Style 3**.

7. Format the data labels to include only the **Category Name** and **Value**.

8. Delete the legend.

9. Move the chart to a new sheet named: **Older Cars**

10. Move the **Older Cars** chart sheet to the end of the sheet order (to the right of the Brands & Ages sheet).

11. In the **Brands & Ages** sheet, create a 2-D pie chart using the **range A4:B11**.

12. Add data labels that contain only the value (you may need to remove leader lines even if they don't show).

13. Set the chart's height to **5"** and the width to **6.25"**. If necessary, move the chart up near the top of the sheet.

14. Change the number in **cell B11** to **10**. If your chart doesn't change, then you may need to tap F9 or click the **Calculate** button at the bottom-left corner of the worksheet.

15. Save your workbook.

- *Using eLab:* Save it to your **Excel Chapter 4** folder as **E4_P2_eSubmission** and attach the file to your eLab assignment for grading.
- *Not using eLab:* Save it to your **Excel Chapter 4** folder as: **E4_P2_Submission**

EXCEL

✈ Extend Your Skills

These exercises challenge you to think critically and apply your new skills in a real-world setting. You will be evaluated on your ability to follow directions, completeness, creativity, and the use of proper grammar and mechanics. Save files to your chapter folder. Submit assignments as directed.

E4-E1   That's the Way I See It

As a student who prides yourself on achieving top grades, you are creating a chart of your scholastic achievements. Create a new blank worksheet and set up headings so you can list your recent classes in one column and the grades for those classes in the next. List your classes in chronological order, oldest to newest (at least ten classes), and then insert your grades in the next column (if you don't have access to your grades or this is your first class, enter grades you would like to achieve). Create a line chart from the data to show the trend in grades over time. Modify the chart to use your favorite colors, and use conditional formatting to highlight the top three grades and the lowest three grades you received. Save your workbook as: **E4-E1-ClassGrades**

E4-E2   Be Your Own Boss

You are looking to acquire more funding to expand Blue Jean Landscaping after a very successful year. You are preparing a report on last year's financial statements, and you want to include a chart to emphasize your revenue growth and the decrease in expenses. Open **E4-E2-RevandExp**, select the data, and then choose the best chart to show this trend. Insert the **BlueJeanLandscaping.jpg** logo and modify the chart as you see fit so that it looks professional and presentable. Apply conditional formatting to highlight the top three Revenue months and the bottom three Expense months. Save your workbook as: **E4-E2-RevandExpCharts**

E4-E3   Demonstrate Proficiency

After very encouraging BBQ sauce sales for its two new flavors last year, Stormy BBQ has asked you to create some charts that represent a comparison of its three sauces. Open the file **E4-E3-SauceSales** and use the data to create both a column chart and a line chart for the year. Move both of these charts to new sheets. Then add a total at the bottom for each sauce and create a pie chart comparing the three totals. Be sure to include the Stormy BBQ logo (**StormyBBQ.jpg**) on each chart and adjust the styles, layouts, and formatting in the charts appropriately. Try and use the corporate colors, red and gold, where possible. Save your workbook as: **E4-E3-SauceSalesCharts**