

EXCEL 2016

Data Visualization and Images

In this chapter, you will learn a variety of ways to create visually interesting worksheets. This chapter will help you understand when to create charts, which chart types to use, and how they are useful in understanding relationships between numbers in a worksheet.

LEARNING OBJECTIVES

- Insert charts
- Use chart tools to modify charts
- Move and size charts
- Edit chart data

CHAPTER TIMING

- Concepts/Develop Your Skills: 1 hr
- Self-Assessment: 1 hr 20 mins
- Total: 2 hrs 20 mins

PROJECT: REPORTING COMPANY SALES DATA

Airspace Travel has put together a report of sales figures for the year and has asked you to help create some charts. 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.

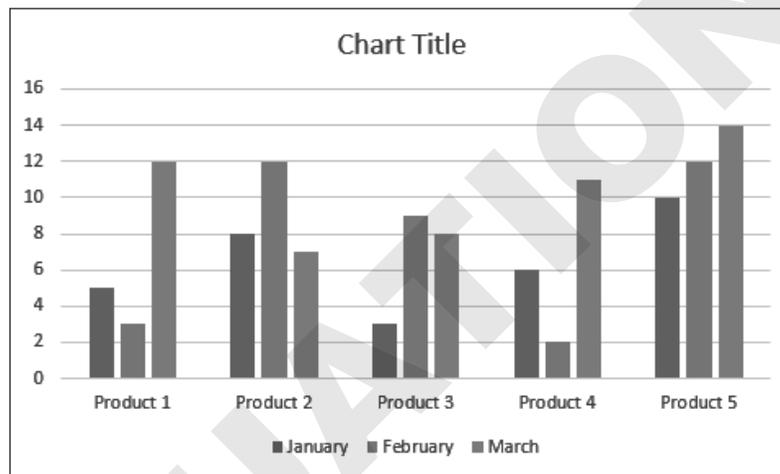
Create Charts to Compare Data

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, and 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, and Excel does the rest. After the chart is created, you can add or modify chart elements to change the way your chart looks.

Choosing a Chart Type

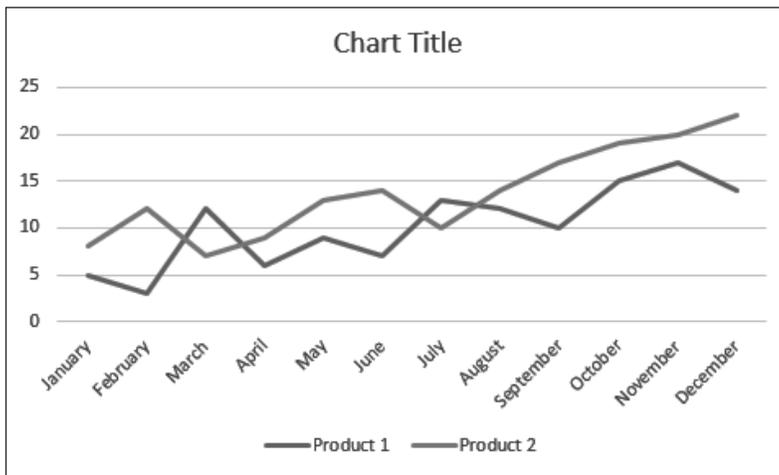
Excel has more than a dozen different types of charts to choose from, with variations of each chart type as well. However, it is important to remember that the purpose of a chart is to simplify data and not make it more complicated. The most common options to use are a column or bar chart, a line chart,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

Column Chart and Bar Chart



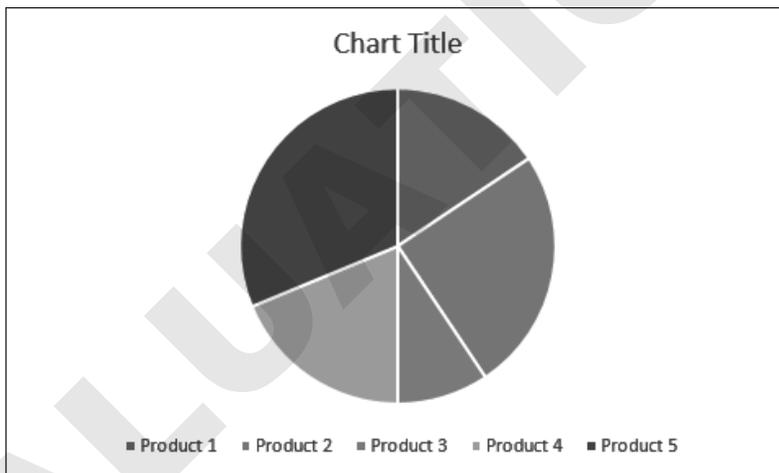
A column chart displays data in columns across the horizontal axis. A bar chart displays data in bars across the vertical axis, so they are basically the same chart, simply vertical up and down or horizontal left to right. Column charts are useful to compare data across several categories.

Line Chart



A line chart displays your 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 Chart



A pie chart shows a comparison of your 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 charts 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

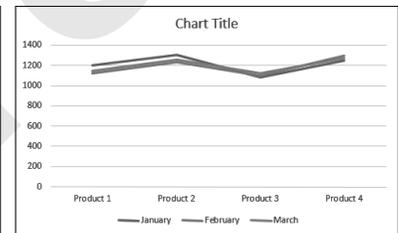
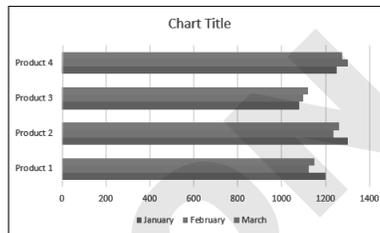
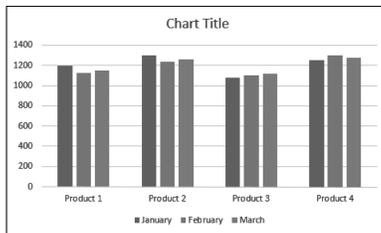
Selecting Chart Data

Choosing the right data is very important to make sure Excel can create the chart correctly. The best method is to always select the data and include the appropriate row and column headings.

To create a column, bar, or line chart, the data selection is the same.

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

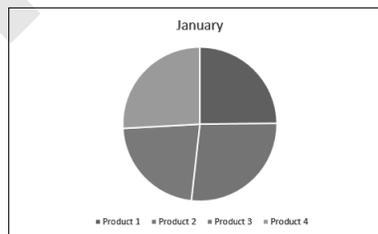
The data, including row and column headings, is selected to create your chart; notice the blank cell in the top-left corner is also included.



These three charts result from the same selection of data.

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

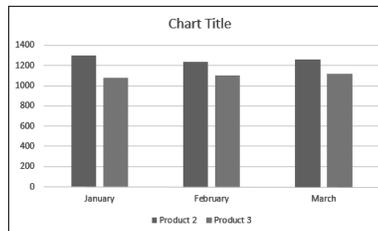
Q1 Revenue			
	January	February	March
Product 1	1200	1123	1150
Product 2	1301	1235	1260
Product 3	1080	1100	1120
Product 4	1250	1300	1275



Only the January data series is selected to create the 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

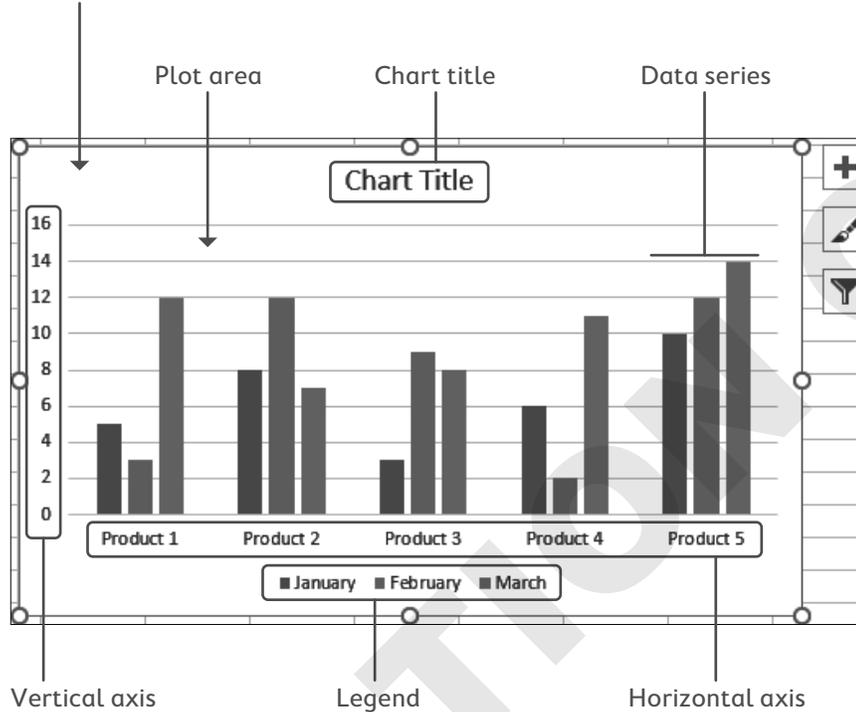


For a column, bar, or line chart showing only Products 2 and 3, you would select the three rows of data as shown, again including the blank cell.

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)



DEVELOP YOUR SKILLS: E3-D1

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

1. Start Excel, open **E3-D1-Sales** from the **Excel Chapter 3** folder, and save it as **E3-D1-SalesCharts**.

2. Follow these steps to insert a column chart:

Agent	JAN	FEB	MAR	APR	MA
Adam Landry	13,629	14,841	19,611	19,737	15,208
Debra Cutler	13,904	17,040	12,207	9,044	18,208
Elizabeth Betts	11,907	12,685	23,329	15,208	20,208
Hope Mooney	12,083	14,490	22,446	12,670	16,208
Tim McKay	23,272	20,287	12,161	21,237	16,208

- A** Select the **range A3:D8** to compare the results for all agents for the first three months of the year.
- B** Choose **Recommended Charts** from the Ribbon.
- C** Excel recommends a clustered column chart. Click **OK** to accept and insert the chart.

3. Save the workbook.

Working with 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 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, and the formatting options change for each chart element.

☰ Chart Tools → Format → Current Selection → Format Selection | Right-click → Format (Selection)

Chart Design Tools

You can use Design Tools to quickly and easily change the way your chart looks, using features like Chart Styles and Layouts. 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 the various chart elements.

 View the Video "Using the Chart Design Tools."

Using 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 new features of Excel charts is the ability to filter your 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.

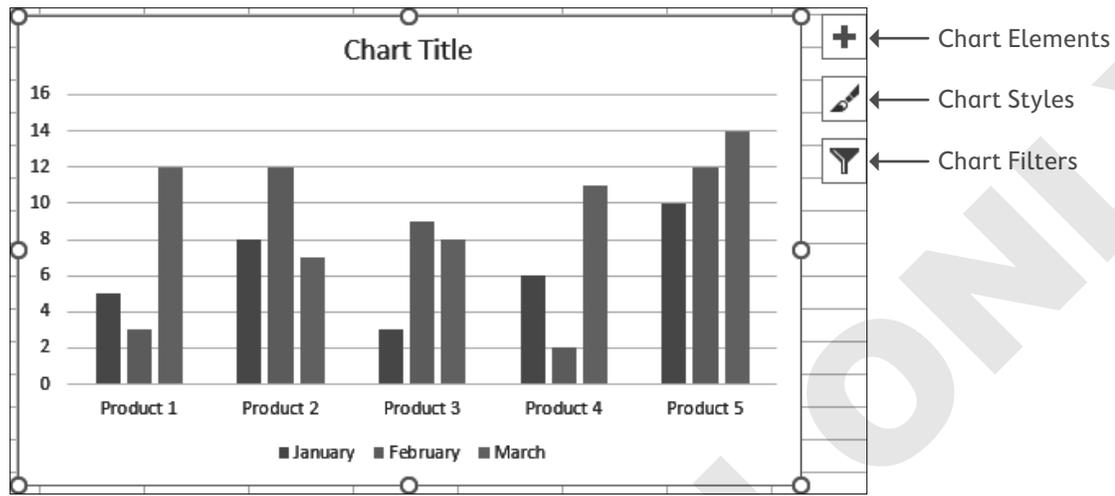
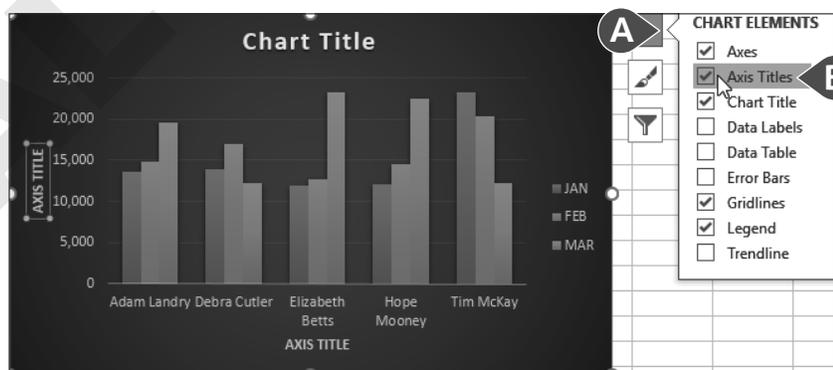


Chart Tools → Design

DEVELOP YOUR SKILLS: E3-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 **E3-D2-SalesCharts**.
2. If necessary, click anywhere on the column chart to select it, which displays the Chart Tools 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:



- A Click on the **Chart Elements** button.
- B Click to check the box beside **Axis Titles**.

6. Point to the **Vertical Axis Title** you just added and triple-click to select the entire text.
7. Type **Monthly Sales** for the axis title.
8. Select the **Horizontal Axis Title** and replace the text with **Agent** for the title.
9. Replace the **Chart Title** with the title **Airspace Q1 Sales**.
10. Follow these steps to change the chart type:



- A Select **Change Chart Type** from the Ribbon to open the dialog box.
- B Go to **Recommended Charts**.
- C Choose the second option, **Stacked Column**, and then click **OK**.

11. Save the workbook.

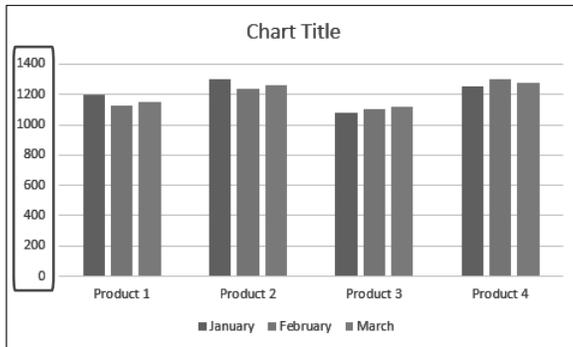
Chart Format Tools

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 could be a color, gradient, texture, or even a picture. Other possibilities include adding shapes or WordArt to a chart.

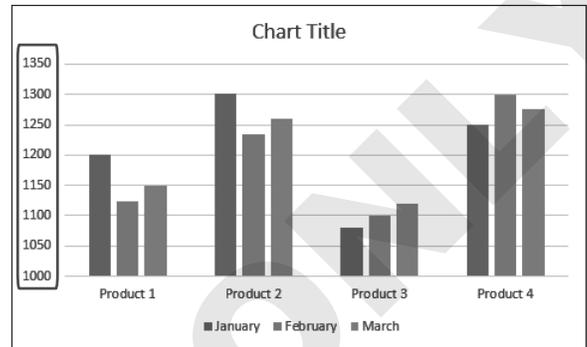
Axis Options

You may want to adjust your axes to focus your data on significant differences or to simply adjust the appearance of the axes. 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 1000 and 1300, you can set your minimum at 1000 to highlight the differences because the first 1000 units are the same for all the data points. Another useful option is to change the Number Format for the axis; for example, to Currency.



The data looks very similar with the axis values ranging from 0 to 1400.



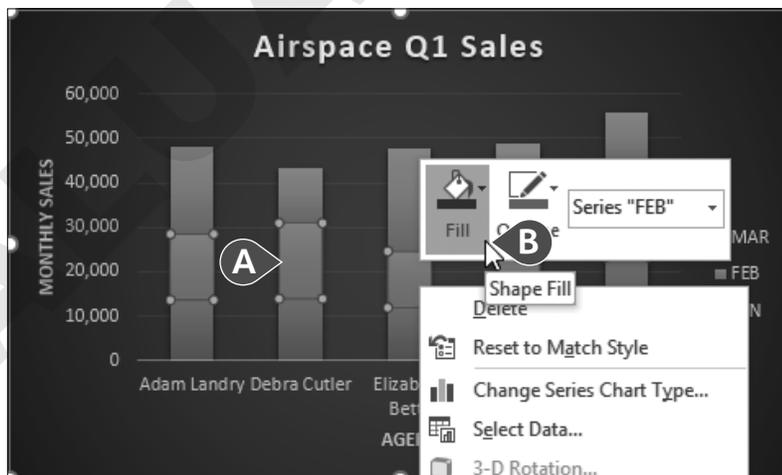
The Product differences are much easier to see with the axis values starting at 1000.

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

DEVELOP YOUR SKILLS: E3-D3

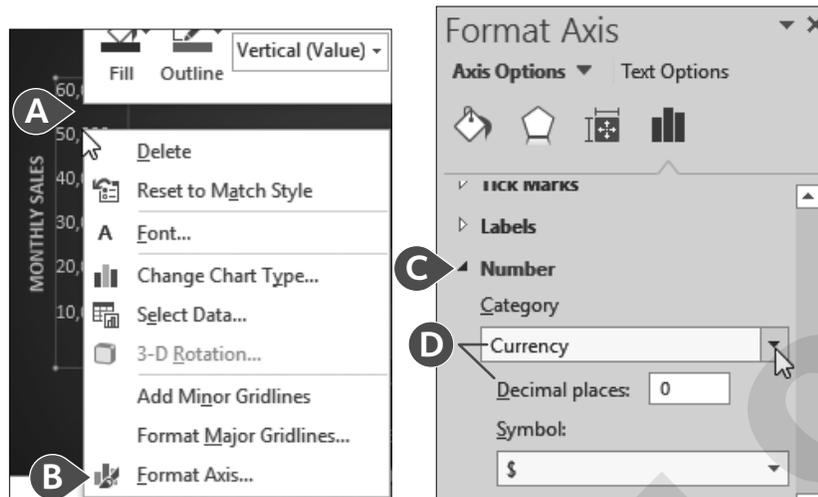
In this exercise, you will adjust the chart colors and axis numbering.

1. Save your workbook as **E3-D3-SalesCharts**.
2. Continuing with the **Airspace Q1 Sales** column chart, follow these steps to adjust the color of the FEB series:



- A Click once on any orange block to select the FEB Data series.
- B Right-click, click on **Fill** in the shortcut menu, and then choose **Red** from the Standard Colors.

3. Adjust the Fill Color for the MAR series to **Standard Color Purple**.
4. Follow these steps to adjust the vertical axis:



- A Point to a number on the vertical axis and then right-click to display the shortcut menu.
 - B Choose the **Format Axis** command.
 - C In the Format Axis pane, scroll to the bottom and click on **Number** to expand (then you may need to scroll down to see Number options).
 - D Choose **Currency** from the Category list using the menu button ▼ and, if necessary, change the Decimal places to **0**.
5. Save the workbook.

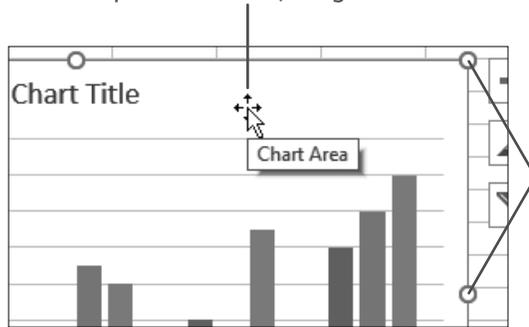
Move and Size Charts

Charts can be moved around on a worksheet or moved to a different worksheet. A chart can be moved on the same sheet by a simple drag, but be sure you click the chart area and not another chart element, or you will be moving that element.

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 charts onto a 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.

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 the 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.



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: E3-D4

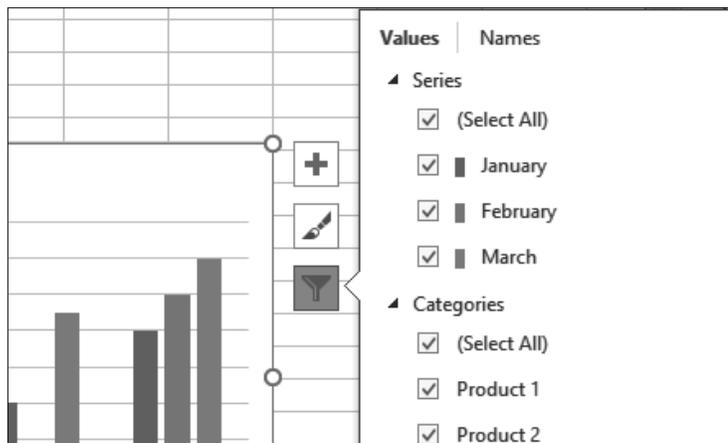
In this exercise, you will move the existing chart, create another chart, and resize it.

1. Save your workbook as **E3-D4-SalesCharts**.
2. With the **Airspace Q1 Sales** chart selected, choose **Chart Tools→Design→Location→Move Chart** to open the Move Chart dialog box.
3. In the dialog box choose **New Sheet**, in the New Sheet box type **Q1 Sales** for the name of the new sheet, and then click **OK**.
4. Go to the **Sales** worksheet to create a new chart.
5. Select the **range A3:G6**, which holds the data for Adam, Debra, and Elizabeth.
6. Choose **Insert→Charts→Insert Line or Area Chart**  **menu button ▼→Line** (the first option on the top row in the 2-D Line group).
7. Drag the chart so it is directly below the data.
8. Rename the Chart Title **Semiannual Sales**.
9. Save the workbook.

Edit Chart Data

After a chart has been created, the data is linked, so that 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 which data is 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. You can also modify your chart data by swapping the Horizontal Axis and the Legend categories using the Switch Row/Column button.

Sometimes a better option is to keep all existing data in the chart but 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.



The Chart Filter feature lets you check off the Series or Category you wish to display and uncheck the ones to hide.

☰ Chart Tools→Design→Data→Select Data

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

DEVELOP YOUR SKILLS: E3-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 **E3-D5-SalesCharts**.
2. Ensure the **Semiannual Sales** chart is selected on the **Sales** worksheet.
3. Right-click anywhere in the chart and choose **Select Data**.
4. The Chart data range is already selected, so drag across the worksheet range **A3:G8** to select the new data and click **OK**.
5. Click the **Chart Filters**  button; click the checkbox next to **Adam, Elizabeth, and Tim** to remove the check and filter out their data; and then click **Apply**.
6. Adjust the Number format for the vertical axis to display **Currency** with no decimals.
7. Save the workbook. Exit Excel.

Self-Assessment

Check your knowledge of this chapter's key concepts and skills by completing the Self-Assessment. The answers to these questions can be found at the back of this book.

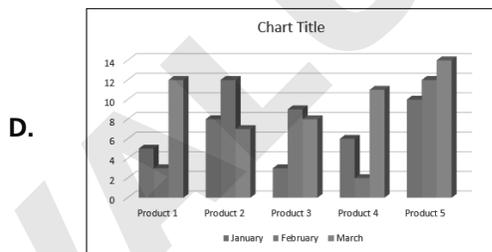
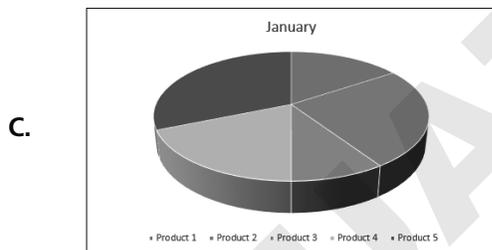
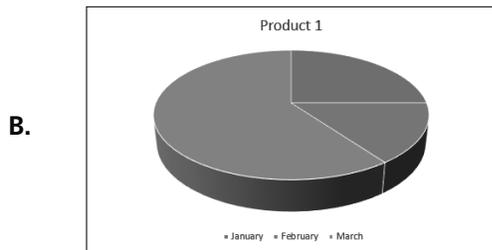
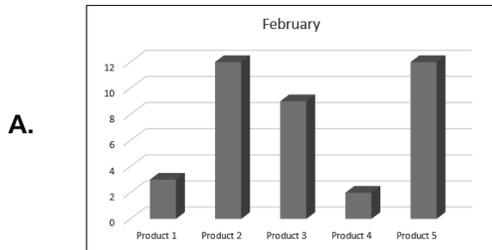
1. Changing the style does not change the layout (the position of the elements on the chart area). True False
2. Number formatting options for an axis include Currency, Date, and Percentage. True False
3. When you move a chart to a new sheet, you cannot change the sheet name. True False
4. The Chart Filters feature allows you to remove values from your chart, and then later you can choose to display all the data again. True False
5. The best chart type to use for comparing one series of data, as part of a whole, is a line chart with a trend line. True False
6. You should create a column or bar chart to compare your data by categories. True False
7. What chart type is useful for showing trends in data over time, such as days, months, or years?
 - A. Pie
 - B. Bar
 - C. Column
 - D. Line
8. What range of data would you select to create a pie chart of Product 1 sales for January to March?

	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

- A. A1:B6
 - B. A1:D2
 - C. A2:D2
 - D. A1:D6
9. Which of the following is NOT one of the chart elements?
 - A. The chart title
 - B. The legend
 - C. The horizontal axis
 - D. The pivot area

10. The selection of data shown in the image below could produce which of the following charts?

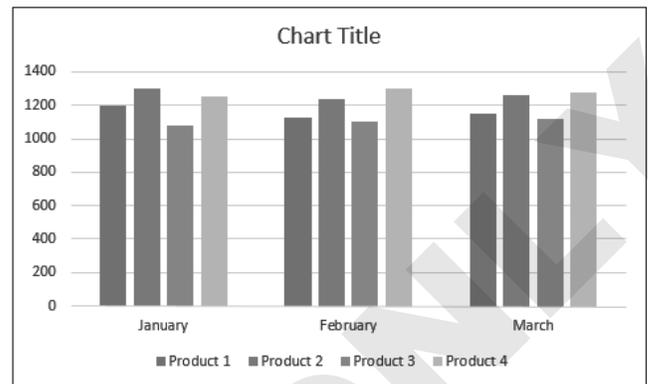
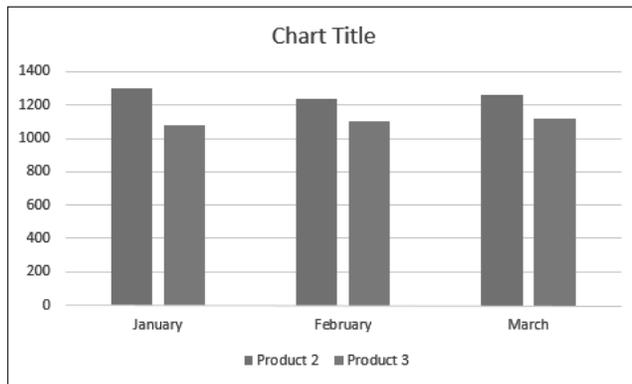
	January	February	March
Product 1	5	3	12
Product 2	8	12	7
Product 3	3	9	8
Product 4	6	2	11
Product 5	10	12	14



11. After moving a chart to a chart sheet, which of the following is true?

- A. You can continue to edit all of the elements using chart tools.
- B. You can no longer make any changes to the chart.
- C. You can't move the chart again.
- D. You can move but not edit the chart.

12. Which feature could have been used to modify the first chart to look like the second?



- A. Change Chart Type
- B. Select Data
- C. Chart Filters
- D. Either Select Data or Chart Filters

EVALUATION ONLY

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