

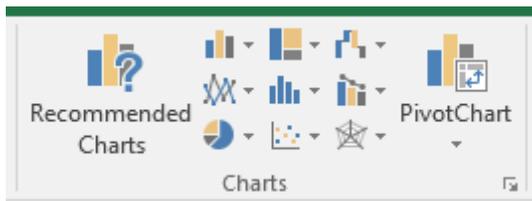
1. Manipulating Charts

Charting or graphing of data makes it easier to understand a trend about presentation of data. Many of us need to create such graphs, charts or visual chars like pi-chart etc at times. It often complicated to understand and create charts with conventional tools or software. Not anymore, with powerful features of Microsoft Excel, charting and graphing has been extremely simplified.

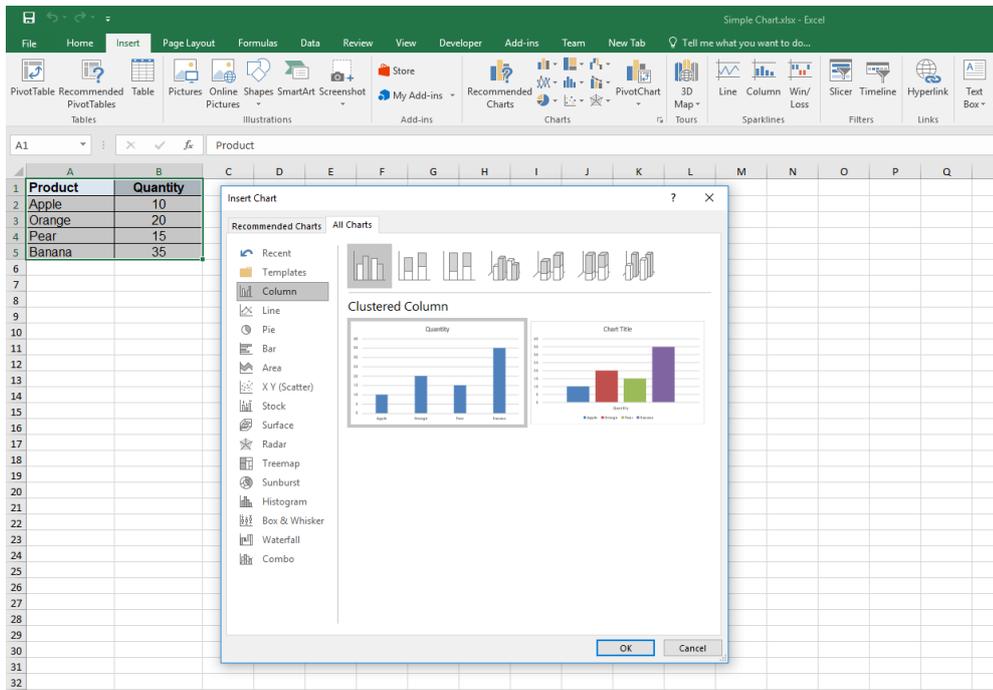
You can create a chart on its own sheet or as an embedded object on a worksheet. You can also publish a chart on a Web page. To create a chart, you must first enter the data for the chart on the worksheet. Then create a basic chart that you can format later.

1.1 How to Draw Charts?

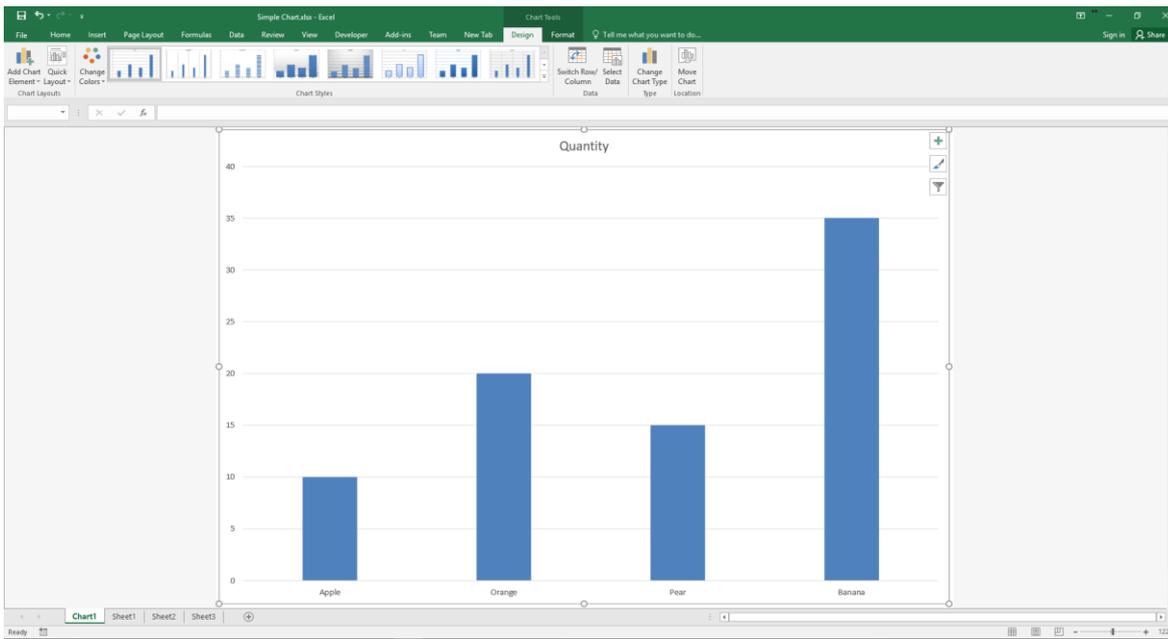
First of all make sure that there is some data in your excel sheet and does not contain any blank cells between the different columns, then click the **Insert** menu and choose the chart type that you wish to draw.



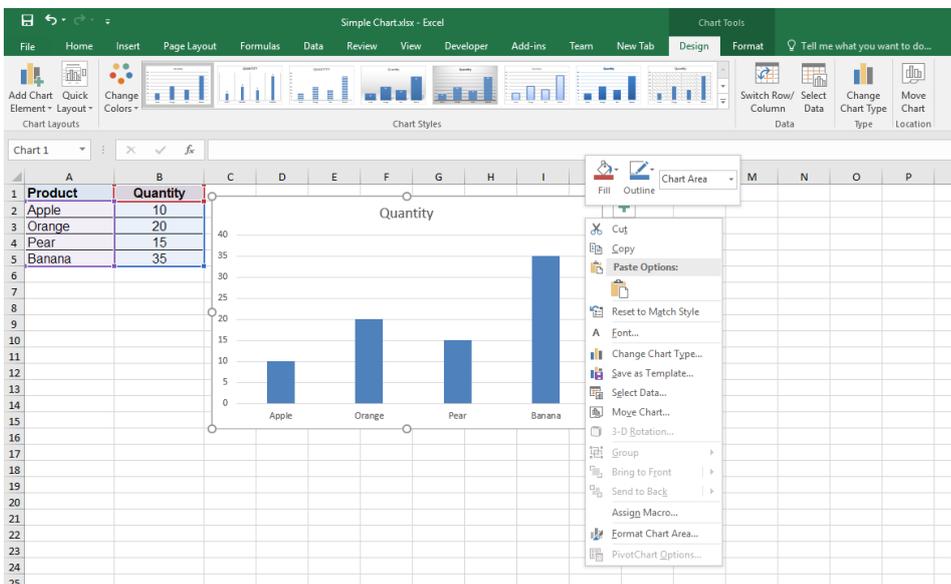
Then select the chart in the Insert Chart dialog to create the chart



Besides, the snappiest way to create a chart is to select some data and press **[F11]**.

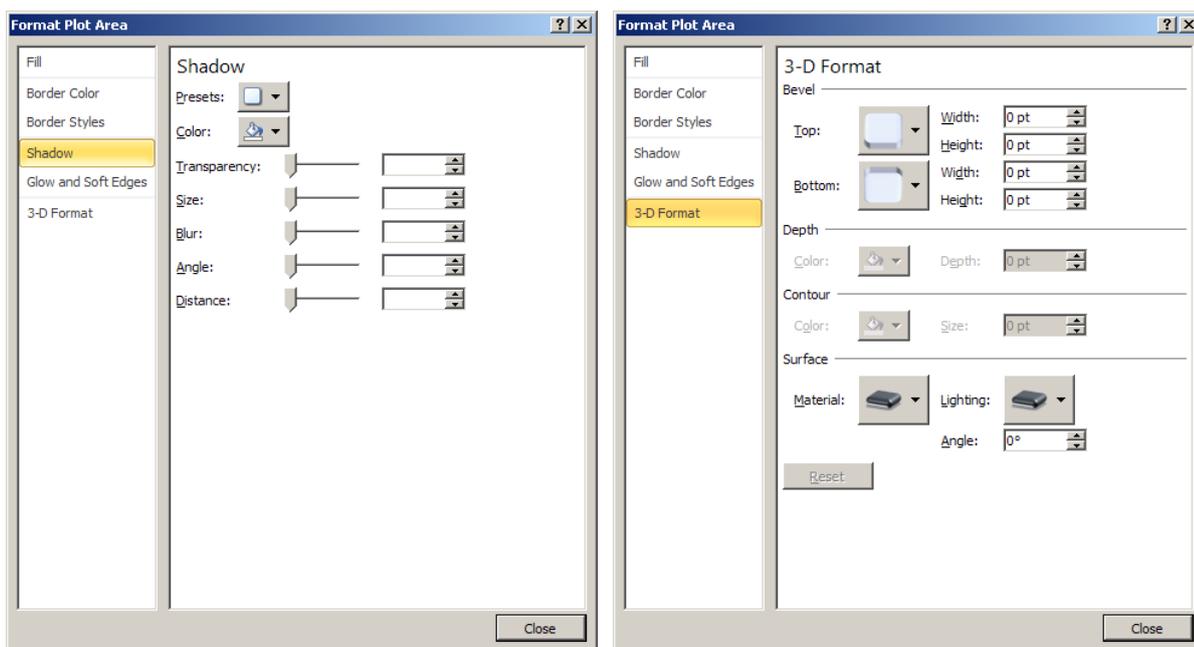


The data in your Excel sheet will be organized as a chart. You can change the attributes by right-click the chart and adjust the options for changing chart types, data, and other formatting.



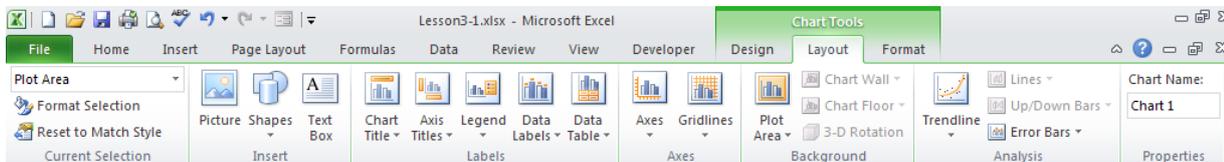
1.1.1 Chart Plot Area

The area that is covered by a specific chart is called the chart plot area. By default Excel draws charts according to the default configuration, but it's very easy to edit the plot area, simply right-click the chart and choose the **Format Plot Area** option. Now you will see a dialogue box which lets you set the chart's fill style, borders, Glow and soft Edges, and 3-D effects.

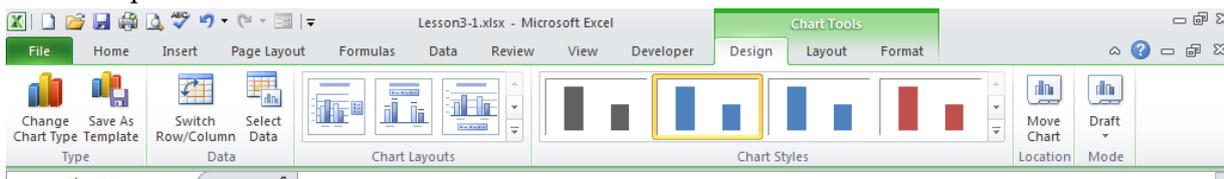


1.1.2 Chart Tools

Chart Tools menu allows you to modify Design, layout and formatting of the chart and the table. You can tweak many options related to the charts like layouts, formatting, design, chart type, displaying data, legends, color scheme etc.



In the **Design** option in charting area, you can select other options line graph, pie chart for different kind of representation of the data.



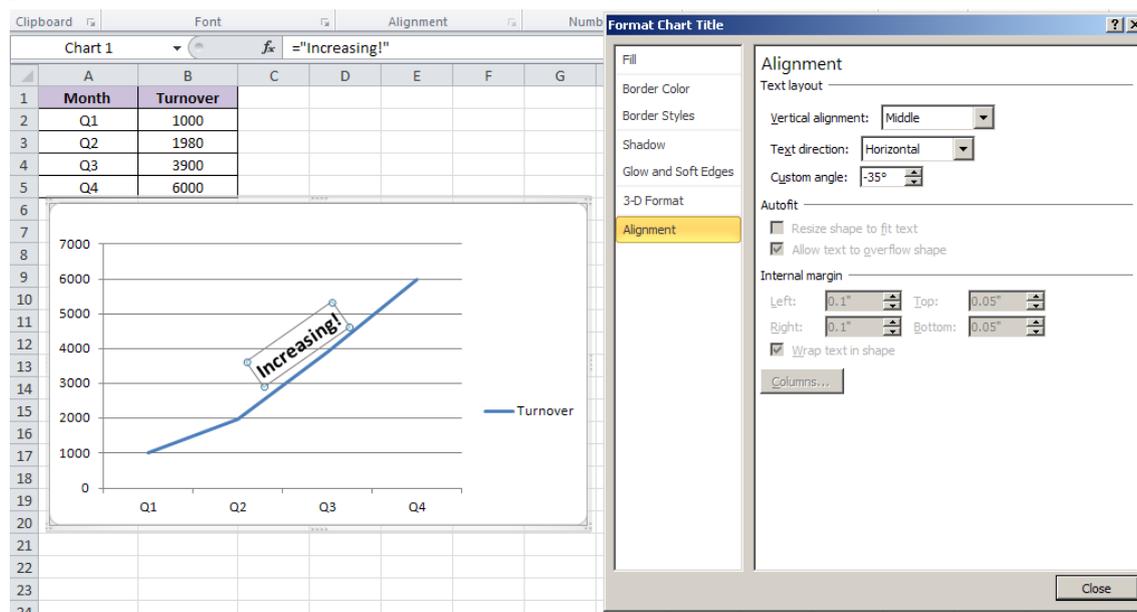
2. Enhancing Chart Appearance

2.1 Working with Titles

2.1.1 Formatting a Title

To change the font, color, border, background, or alignment of a title, you can right-click it and choose **Format Chart Title** to access the Format Chart Title dialog box,

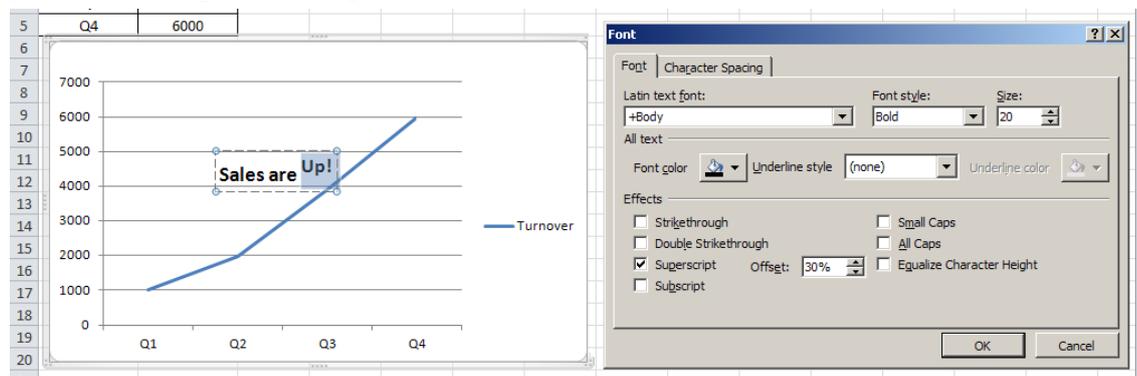
The idea of a diagonal chart title might seem silly at first. However, you can drag the title onto the plot area if you want. A slanted title on the plot area can make a stylish chart annotation.



2.1.2 Formatting Individual Characters in a Title

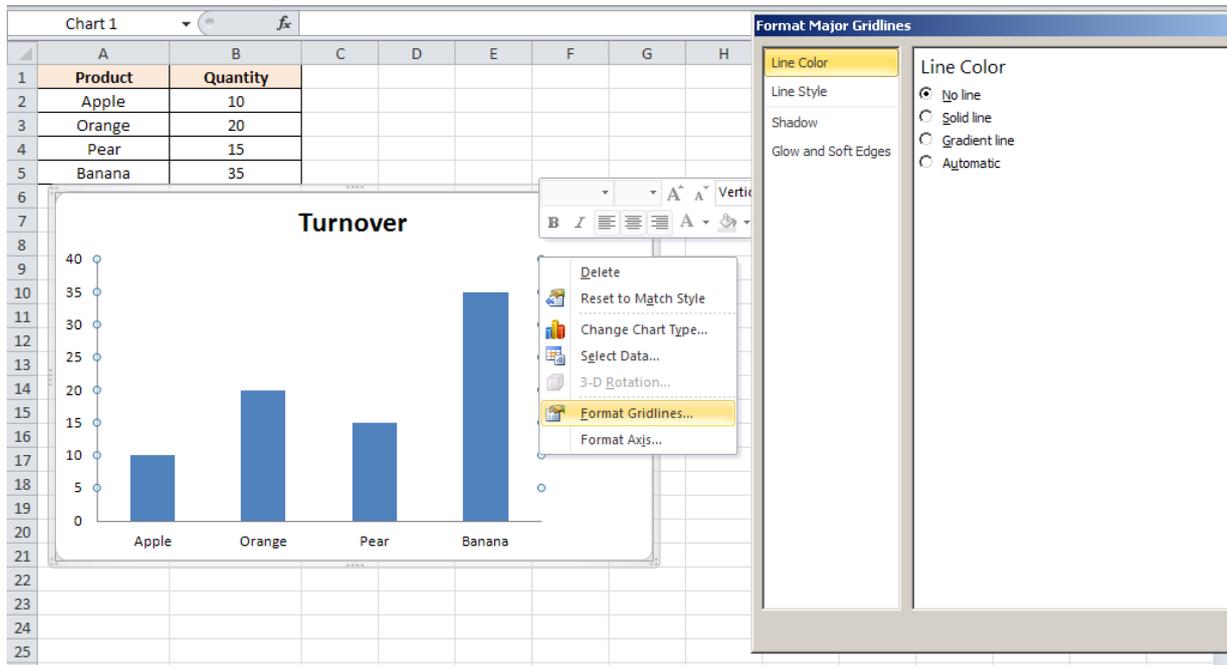
By formatting title characters individually, you can make your titles look like ransom notes. One possible use for individual-character formatting is the characters in the word up have been elevated via the superscript option.

To change the appearance of one or more characters in a title, select the title, pause, and then select the characters you want to change. The dialog box that appears has only a Font tab. In other words, you can't change the background characteristics of selected characters.



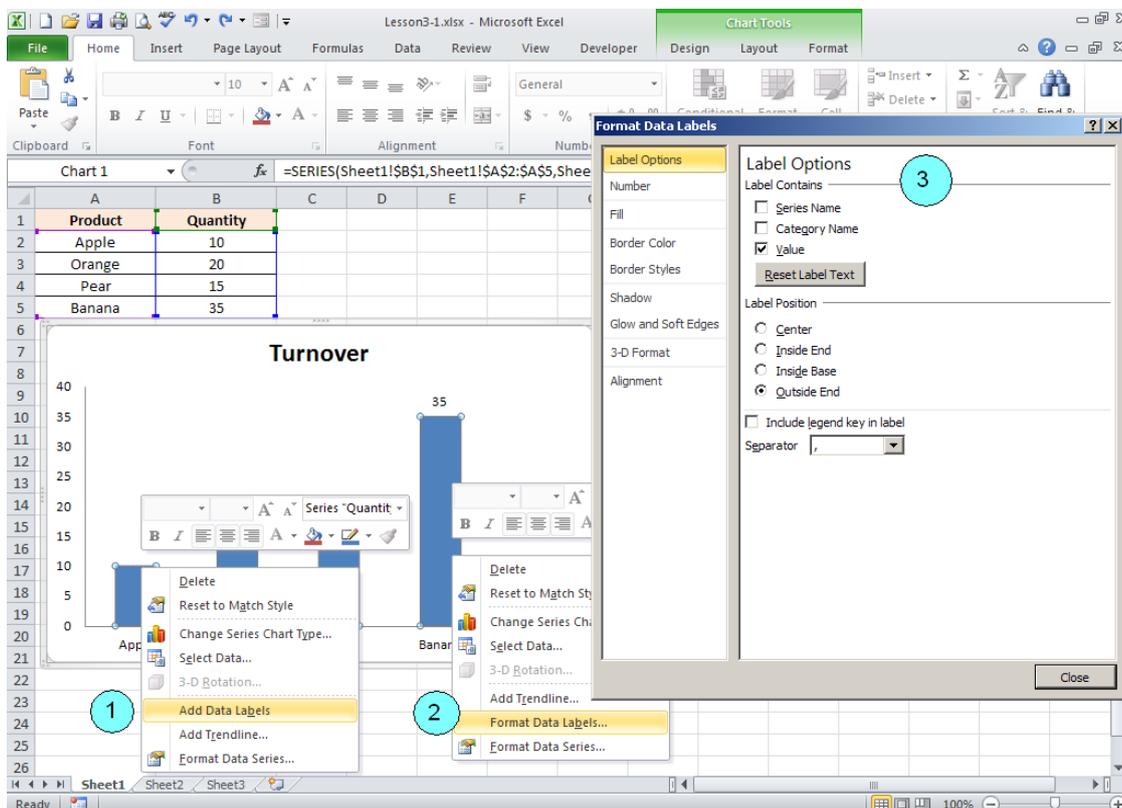
2.2 Working with Gridlines

Excel automatically adds gridlines, but you can delete them if you decide they're not essential, and reduce clutter in the process. Select **Format Gridlines** after right click the chart.



2.3 Working with Data Labels

If you delete gridlines, but feel a little insecure without them, you can show your audience the exact number of value by the data labels above each column. To add data labels, you could first add the data label and then format it.



2.4 Change Colors and Use Fill Effects

Excel formats the plot area a standard gray color. But you can choose another color, use no color at all, or go wild and use pink or purple for the plot area if that's right for your chart. But your chart will have a professional look even if you use plain white when you use fill effects.

To use a gradient fill, you'd select the plot area, right-click, select the **Format Plot Area** and **Format Data Series** on the shortcut menu, select **Fill**, and then select a color.

A gradient fill was also used for each data series to give the colors some shading and depth. The darkest color represents Peacock, whose sales in February were the highest for the quarter, to draw attention to her achievement. The gradient fills define each column well enough that borders around each column weren't necessary, and could be deleted.

In general, avoid putting two dark colors next to each other. The contrast between light and dark adds extra emphasis to your data and makes it easier to see the differences between the different data series. Greater contrast between colors will also help anyone in your audience who may be color blind to read your charts.

The screenshot shows Microsoft Excel with a bar chart titled "Turnover" and the "Format Data Series" task pane open. The chart displays turnover for three products: Apple, Orange, and Pear. The data is as follows:

Product	Quantity
Apple	10
Orange	20
Pear	15
Banana	35

The "Format Data Series" task pane is open, showing the "Fill" tab. The "Fill" section is selected, and the "Gradient fill" option is chosen. The "Type" is set to "Linear", and the "Direction" is set to "From bottom to top". The "Angle" is set to "0°". The "Gradient stops" section shows a color gradient from light green to dark green. The "Color" is set to "#92D050", and the "Position" is set to "0%". The "Brightness" and "Transparency" are both set to "0%". The "Rotate with shape" option is checked.

3. Working with Chart Data

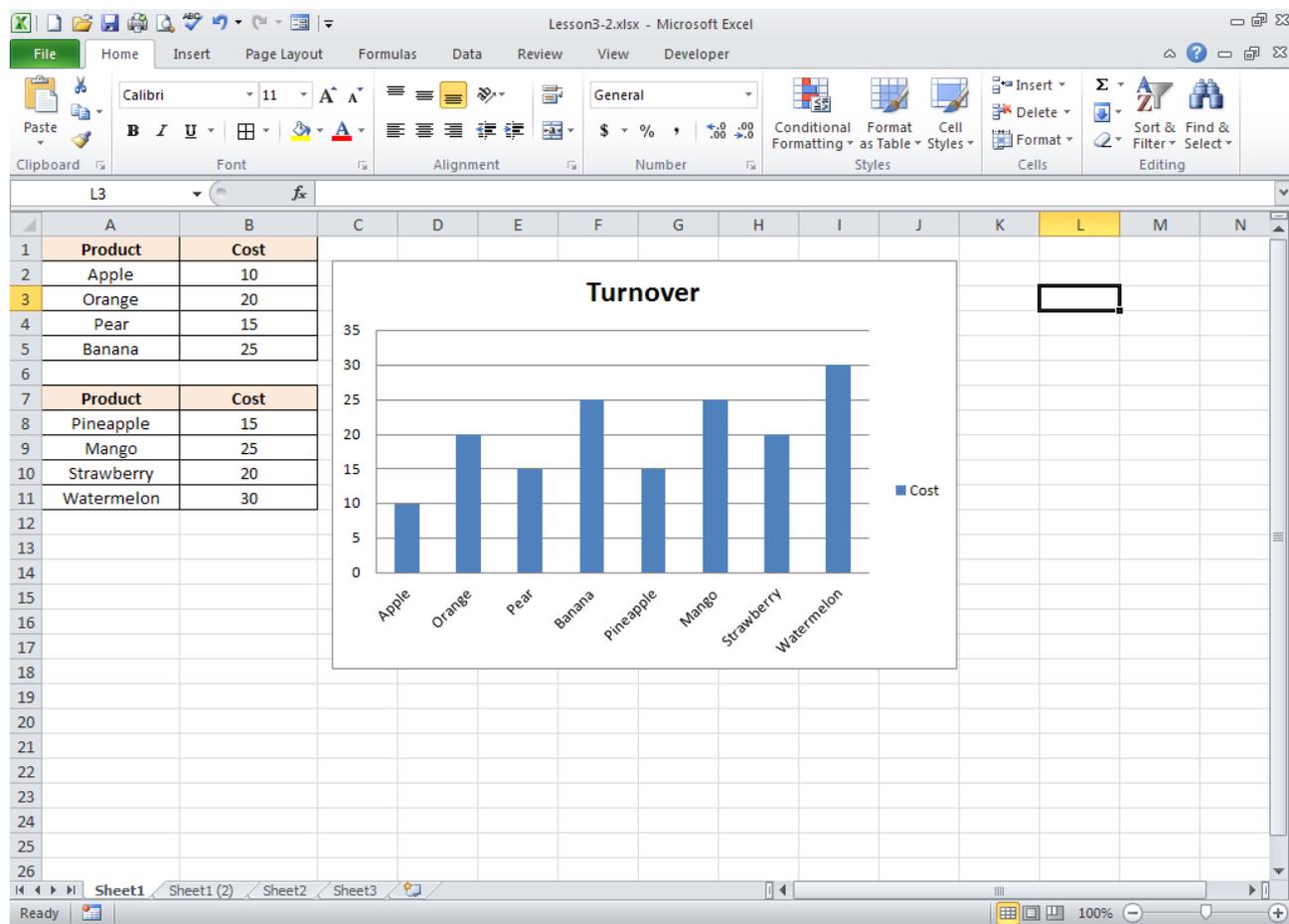
3.1 Adding Data

Excel provides several ways to add data to a chart. Excel drew two rectangles around the chart's source data after the plot area is selected. The first rectangle outlines the worksheet range that the chart is using for its category-axis labels. The second rectangle outlines the data series. Excel uses **blue** for the first rectangle and **purple** for the second, to help you distinguish the two.

3.1.1 Using Copy and Paste

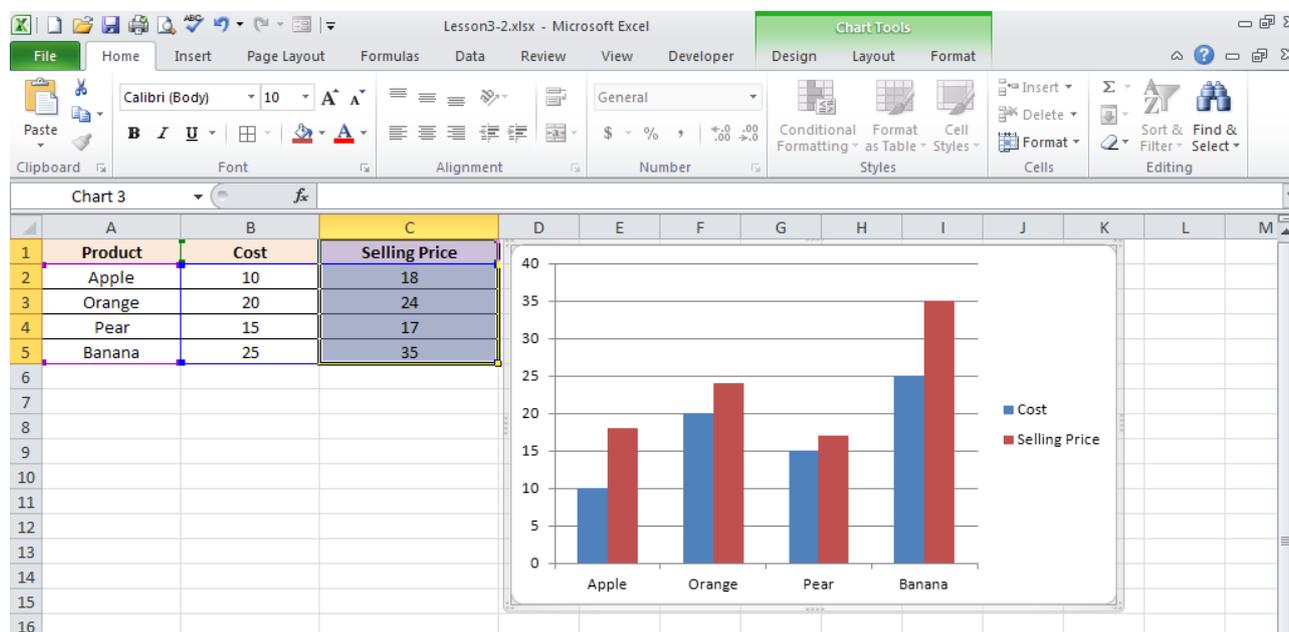
You can use standard copy-and-paste procedures if your chart and its data are close together on the same worksheet. Select the new data, and then choose **Copy**. Next, select the chart, and choose **Paste**.

To extend the chart so that it includes the new data, drag the **Fill** handle in the lower right corner of either rectangle. Alternatively, you can use drag-and-drop by selecting the new data, including its category-axis labels. Position your mouse on the border of the selection so that the mouse pointer changes to an arrow. Then drag the selection and drop it anywhere on the chart. Excel confirms the addition by extending the rectangles to include the new data.



3.1.2 Adding Series

Adding a new series is like adding new points to existing series: Select the data series you want to add, copy it, and then paste it onto the chart. If the new data series is adjacent to the existing data, Excel has no difficulty figuring out that you want to add a new series rather than some new points.



3.2 Removing Data

The simplest way to remove a data series from a chart is to select the series on the chart itself and press **[Delete]**. This method works even if you've refined the selection to a single point in the series; delete that point and the whole series is gone. If you try to delete the series by clearing or deleting the source data on the worksheet, your chart will still reference the empty or nonexistent cells.

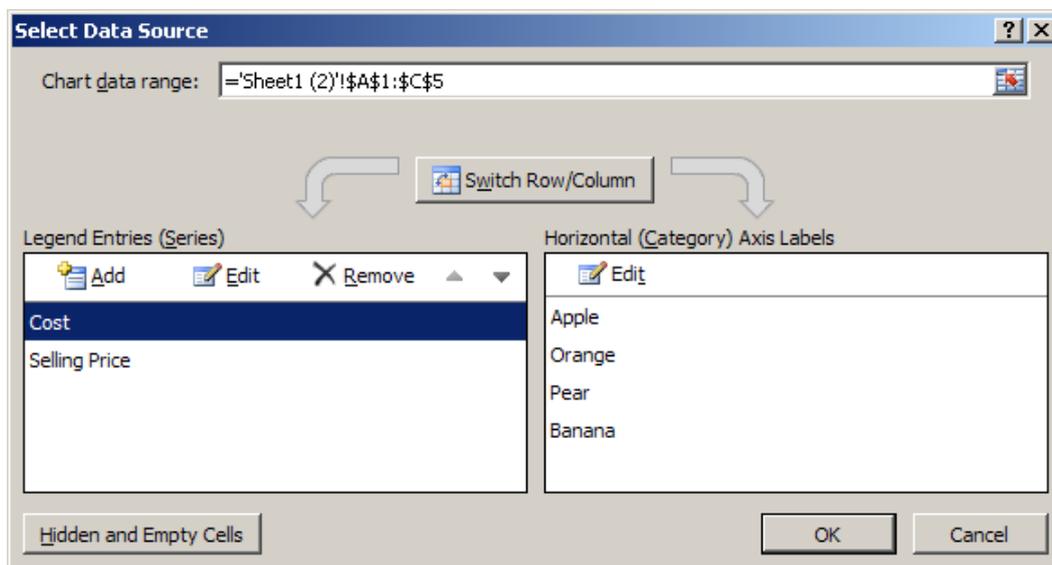
To delete points from either end of all the series in a chart, select the chart area or the plot area, and then drag the Fill handle at one of the corners of either the purple or blue bounding rectangle that surrounds your data. To remove points from a particular series, select that series, and then drag the blue Fill handle.

3.3 Changing or Replacing Data

If you drag the lower or upper perimeter of a data-bounding rectangle, rather than its Fill handle, Excel moves both the start and endpoint of your series. This can be an effective way to obtain detailed views of a chart's data across the whole range of available data. To switch to an entirely different set of data, select any part of your chart, and then choose **Source Data**. You can adjust the entire chart at once (all series) by using the **Data Range** box on the **Data Range** tab, or you can work with individual series on the **Series** tab.

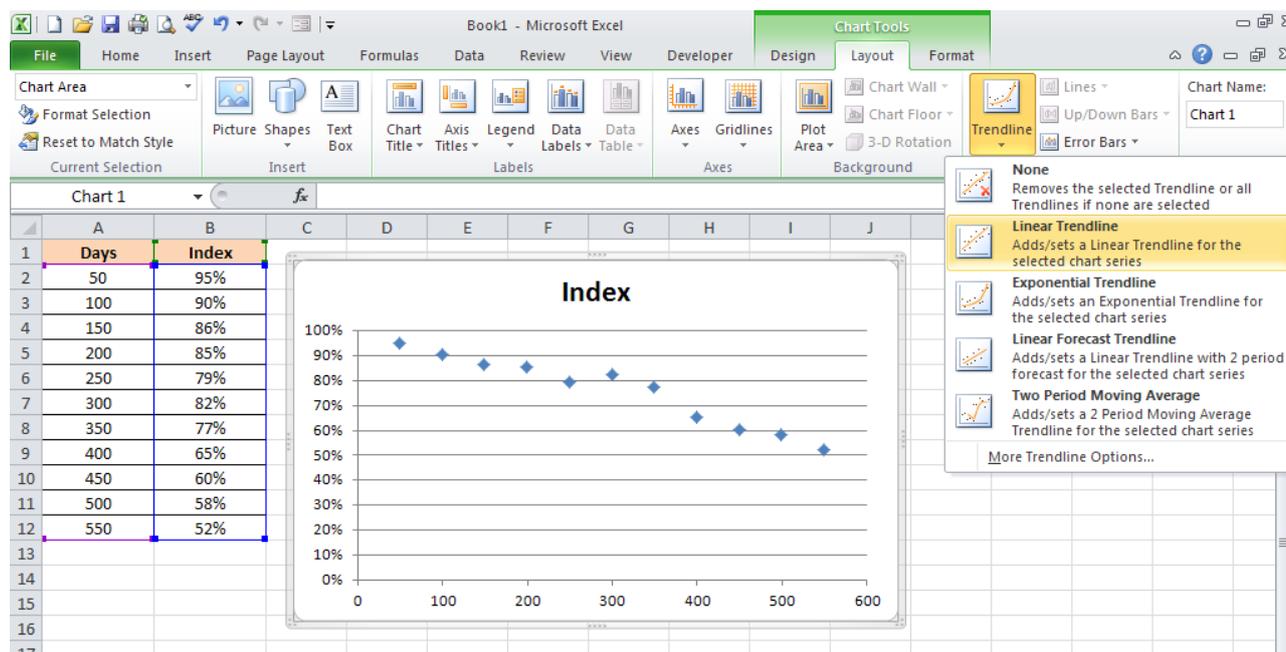
3.4 Changing the Plot Order

To change the order in which series are plotted, select any series and choose **Selected Data Source**. Use the Move Up and Move Down buttons to manipulate the series order.



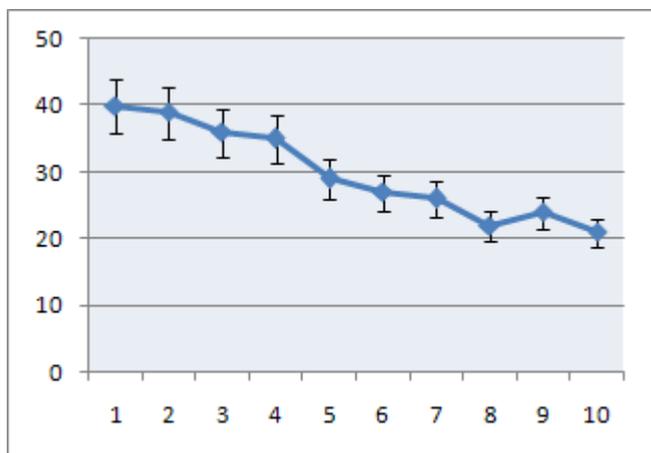
3.5 Adding Trend Lines

A trend line is a line that describes the general tendency of a data series. To add a trend line to a series in an area, bar, column, line, or xy (scatter) chart, first select the series, and then choose **Add Trendline**. If you select Polynomial, indicate the highest power for the independent variable in the adjacent Order box. If you select Moving Average, indicate the number of periods should use in its calculations in the adjacent Period box. After you've indicated the type of trend or regression line, select the Options tab if you want a name for the trend line to appear in the chart legend. For linear, polynomial, and exponential trend lines, you can also set the y-intercept in the Set Intercept box. You can also display the regression equation and the R-squared value beside the trend line plot.



3.6 Error Bars

Error bars express potential error amounts that are graphically relative to each data point or data marker in a data series. For example, you could show 5 percent positive and negative potential error amounts in the results of a scientific experiment:



You can add error bars to data series in a 2-D area, bar, column, line, xy (scatter), and bubble charts. For xy (scatter) and bubble charts, you can display error bars for the x values, the y values, or both.

3.6.1 Add Error Bars

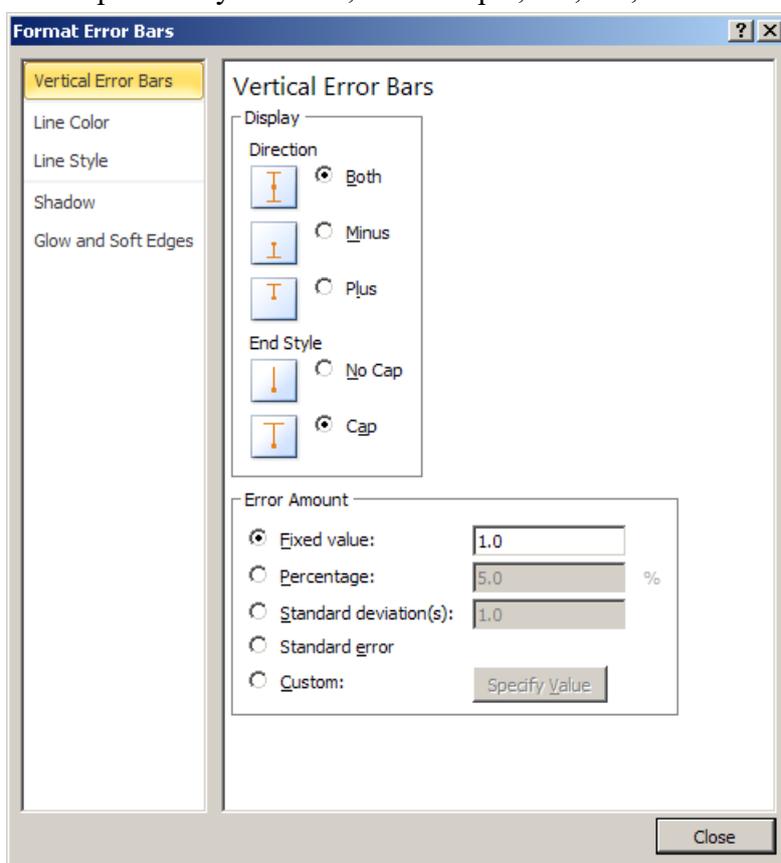
1. Selected data point or data series, click the data point or data series that you want, or do the following to select it from a list of chart elements:
2. On the **Layout** tab, in the **Analysis** group, click **Error Bars**. Click a predefined error bar option, such as **Error Bars with Standard Error**, **Error Bars with Percentage**, or **Error Bars with Standard Deviation**.

Days	Index
50	95%
100	90%
150	86%
200	85%
250	79%
300	82%
350	77%
400	65%
450	60%
500	58%
550	52%

3. Besides, you can click **More Error Bar Options**, and then under Vertical Error Bars or Horizontal Error Bars, click the display and error amount options that you want to use.

3.6.2 Change Error Bar Settings

1. On a chart sheet or in an embedded chart, click the error bar or data series that has the error bars that you want to change. When you select an error bar, any changes that you make affect all of the error bars in its associated data series.
2. On the Format menu, click Selected Data Series.
3. Click the Y Error Bars tab or the X Error Bars tab, depending on the type of error bars that you want to change, and then do one or more of the following:
 - To select a different type of error bar, click the type that you want under Display.
 - To change the method used to determine the error, select the method that you want under Error amount.
 - To change a custom error amount, click Custom. In the Plus and Minus boxes, specify the worksheet range to use as error amount values, or enter the values that you want to use, separated by commas, for example, 0.4, 0.3, 0.8.



3.6.3 Remove Error Bars

On a chart sheet or in an embedded chart, click any error bar to remove all error bars in a data series, and then press **[Delete]**. Or you can right-click an error bar, and then click **Clear**.

You can also remove error bars immediately after you add them to the chart by clicking Undo on the Edit menu, or by pressing **[Ctrl] + [Z]**.

4. Advanced Charting Techniques

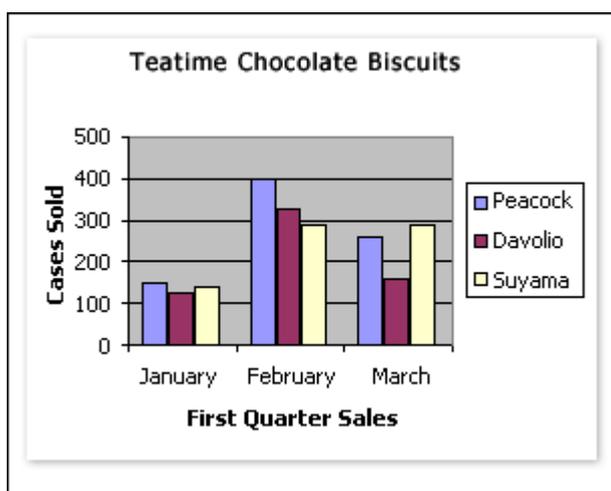
4.1 Choose the Right Chart Type

Selecting the most effective chart type will make your data clearer, stronger, and more informative. Excel offers a wide variety of chart types and simple methods for selecting and previewing them. The best chart type is the one that gets your message across most effectively. This may be rich or simple, lines or points or parts of a circle, even a combination of several types. The more types you've seen and tried, the better you'll be able to choose the right one for your purpose.

4.1.1 A Column Chart Compares Values Directly

Imagine that you have a worksheet showing how many cases of Teatime Chocolate Biscuits were sold by each of three salespeople in each of three months. Now suppose that you want to create a chart that compares the salespeople, month by month.

A Column chart is a good type for comparing values directly, and you want to compare how many cases each salesperson sold, so it's a good fit. When choosing a chart type, it's often wise to keep it simple, so that your message comes across clearly

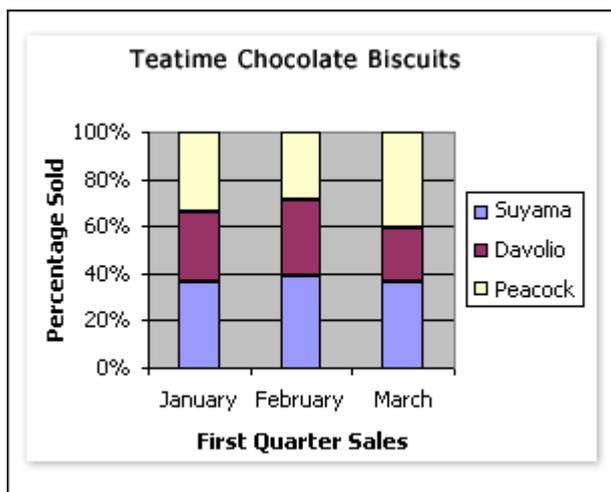


4.1.2 A Stacked Column Chart Compares Parts of Several Totals

What if you want to compare contributions to total sales, instead of just case numbers? You can place a different emphasis on the same data by creating a different kind of chart, the Stacked Column.

A Stacked Column chart compares the contributions to a total of different values, showing either units or percentages. The chart shown here is a 100% Stacked Column chart that shows contributions as percentages.

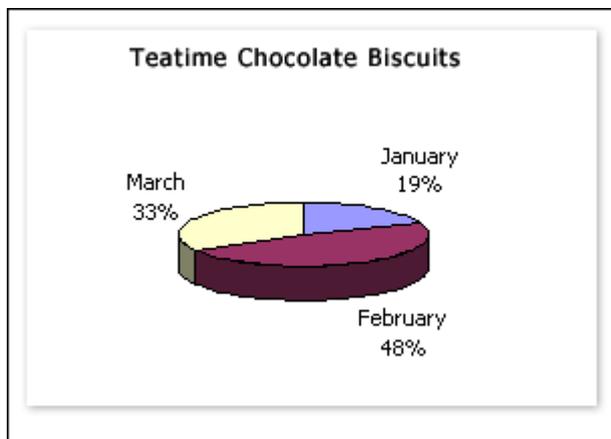
Instead of comparing how much each person sold each month, this chart emphasizes the relative contribution made by each salesperson to each month's total.



4.1.3 A Pie Chart Compares Parts of One Total

What if you want just the big picture? You could create a Pie chart. A Pie chart is designed to show comparisons within a single set of values, and to show how parts contribute to a whole. It's an ideal chart type to display each month's contribution to a quarterly sales total.

In the chart shown here, you can see that February accounts for almost 50% of the sales in the first quarter. That message wasn't so strong in the Column charts. Pie charts are available in various sub-types, such as 3-D, which is visually attractive but can be difficult to understand if it has many sections. Again, choose the form of chart that makes your point most effectively.

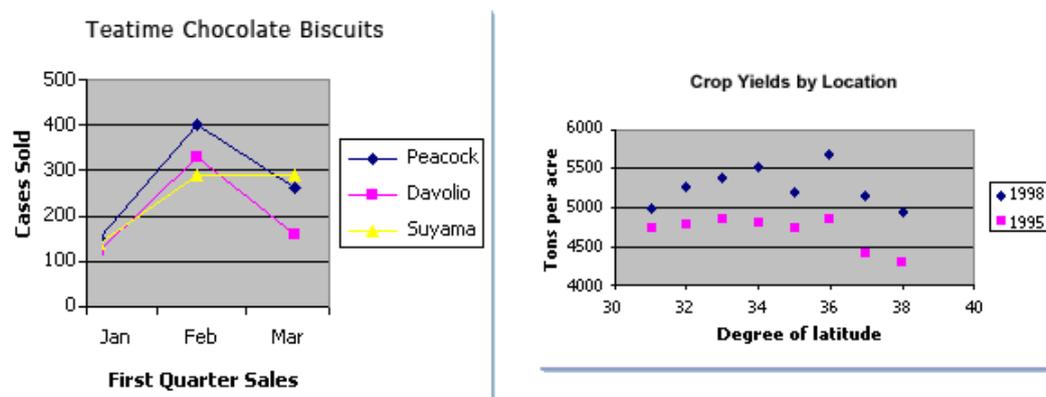


4.1.4 A Line Chart Compares Values over Time

A type of chart well suited to showing changes and trends over time is the Line chart. You could make comparisons of salesperson performance dramatically visible by showing monthly numbers this way.

Line charts and XY (Scatter) charts look very similar in the Chart type list. In fact they are quite different, as you can see in the two charts shown here. It's important to choose the one that will work for you. Here are some guidelines to help you choose.

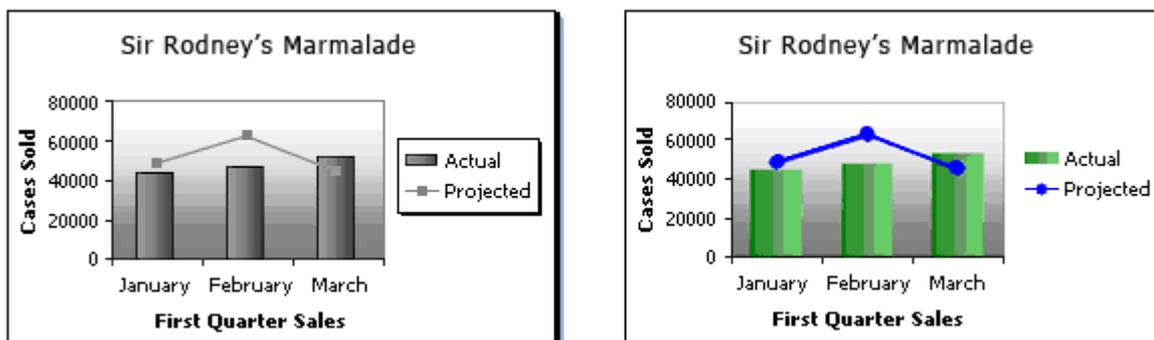
- Line charts are good for displaying trends over time in such business numbers as sales, revenues, and profits. Use a Line chart if you want dates on the bottom of the chart, to make historical developments visible at a glance. Line charts usually have only one set of numbers, shown on the vertical axis.
- An XY Scatter chart compares two sets of numbers at once, one on the horizontal X axis, one on the vertical Y axis. The data values are scattered across the chart. You have the option of connecting the values with lines, but those lines don't show trends over time. XY Scatter charts are good for showing comparisons of numbers such as scientific or statistical data, where several measurements need to be plotted on a single chart. If you wanted to show how many cases of flu occurred in various age groups, or the average incomes in cities of various sizes, an XY Scatter chart would be an effective type.



4.2 Combination Charts

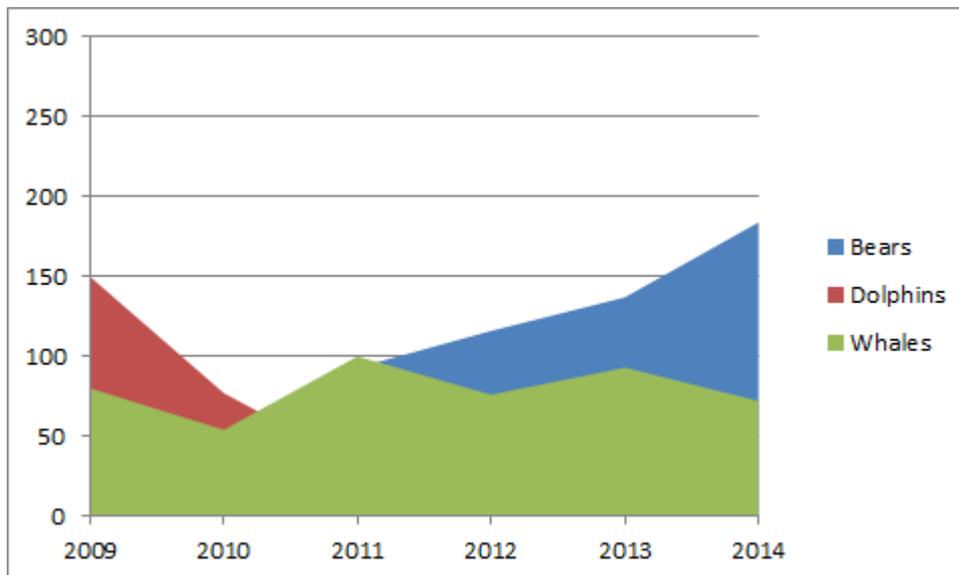
A combination chart uses two or more chart types to emphasize that the chart contains different kinds of information. The chart in the example shows one data series (Projected) as a column chart type and the other (Actual) as a line. To create this kind of overlay effect:

1. Create the first chart
2. Select the data source, copy and paste it into the graph to create the secondary chart
3. Select **Chart** → **Chart Type** and select the secondary chart



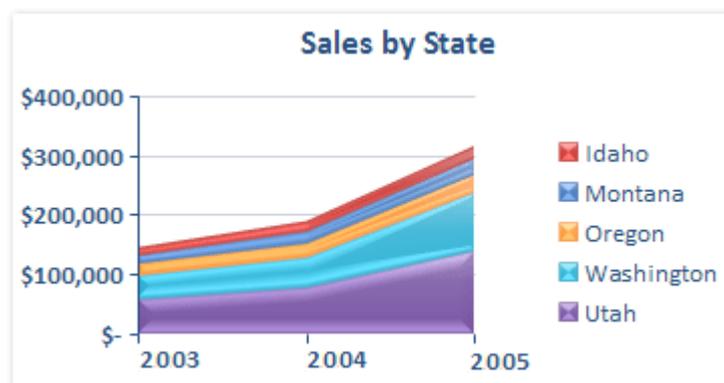
4.3 Area Chart

Area charts are much like line charts, but they display different colors in the areas below the lines. This colorful and visual display distinguishes the data more clearly.



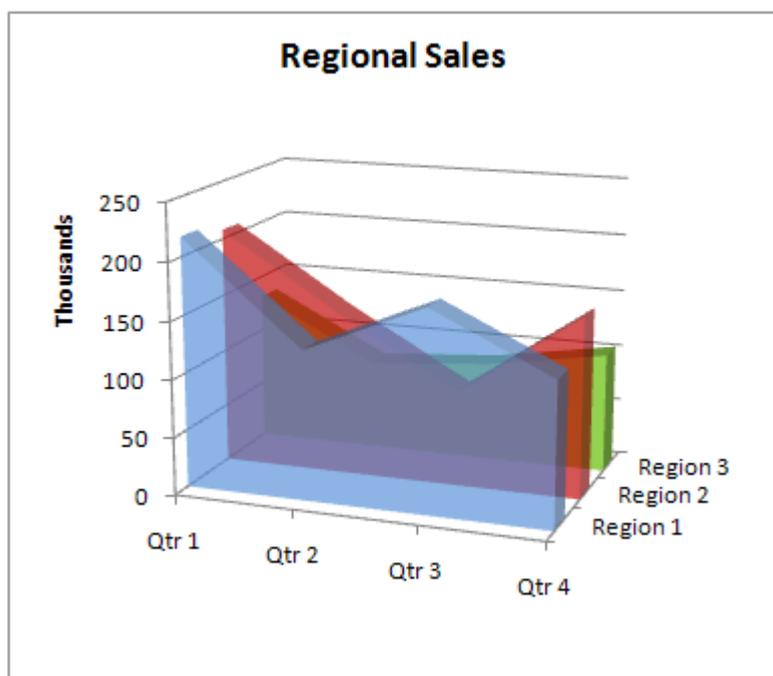
4.3.1 Stacked Area Chart

Data that is arranged in columns or rows on a worksheet can be plotted in an area chart. Area charts emphasize the magnitude of change over time and can be used to draw attention to the total value across a trend. For example, data that represents profit over time can be plotted in an area chart to emphasize the total profit. A stacked area chart also shows the relationship of parts to a whole.



4.3.2 Create an Area Chart that uses Transparency

Unfortunately, data series with smaller values that are plotted in the back of an area chart may be completely or partially hidden behind data series with larger values that are plotted in front of them. However, you can use transparency to show the entire outline of smaller data series through any larger data series in front since Microsoft Office 2007.

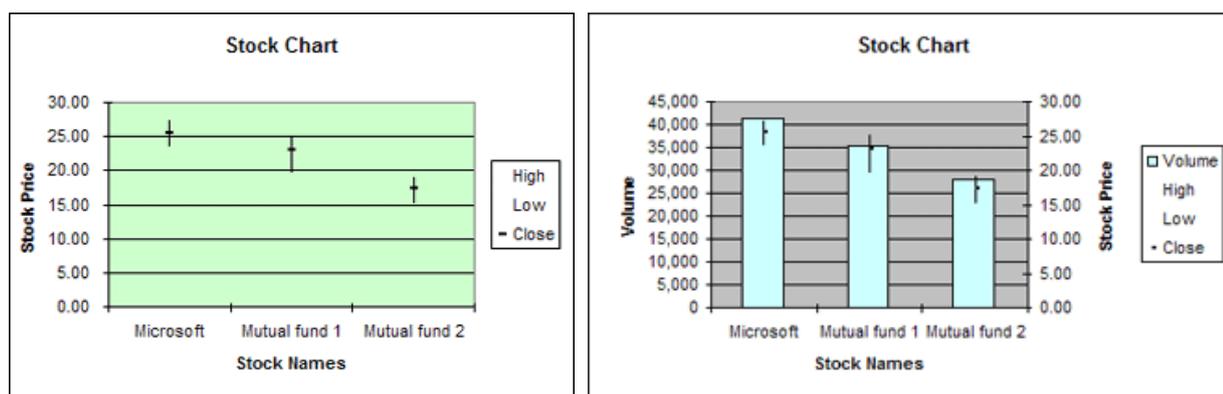


1. Open the worksheet that contains the data that you want to plot in an area chart.
2. Select the data that you want to plot in the area chart.
3. On the **Insert** tab, in the **Charts** group, click **Area**.
4. Under **3-D Area**, click **3-D Area**.
5. Click the chart area of the chart. This displays the **Chart Tools**.
6. On the **Design** tab, in the **Chart Styles** group, click the chart style that you want to use.
7. In the chart, click the legend, and then press **[Delete]**.
8. To change the size of the chart, on the **Format** tab, in the **Size** group, select the shape size that you want in the **Shape Height** and **Shape Width** boxes, and then press **[Enter]**.
9. Click the vertical axis, or select it from a list of chart elements.
10. On the **Format** tab, in the **Current Selection** group, click **Format Selection**.
11. Under **Axis Options**, in the **Display Units** box, click **Thousands**.
12. In the chart, click the first data series, or select it from a list of chart elements.
13. In the **Format Data Series** dialog box, click **Fill**.
14. Under **Fill**, click **Solid Fill**. In the **Color** palette, click the color that you want to use for the selected data series. Drag the **Transparency** slider to the percentage of transparency that you want to use, or type the percentage in the **Transparency** box.

4.4 Stock Chart

As its name implies, a Stock chart is most often used to illustrate the fluctuation of stock prices. However, this chart may also be used for scientific data. For example, you could use a Stock chart to indicate the fluctuation of daily or annual temperatures.

The way Stock chart data is organized in your worksheet is very important. For example, to create a simple high-low-close Stock chart, your data should be arranged with the stock names entered as row headings, and High, Low, and Close entered as column



Depending on the type of stock chart you want to create, you must include a specific combination of data series in your worksheet — and put the data series in order — as shown in the following table.

Stock Chart Type	Required data series and order
High-low-close	High price Low price Closing price
Open-high-low-close	Opening price High price Low price Closing price
Volume-high-low-close	Volume traded High price Low price Closing price
Volume-open-high-low-close	Volume traded Opening price High price Low price Closing price

4.4.1 Create a Stock chart

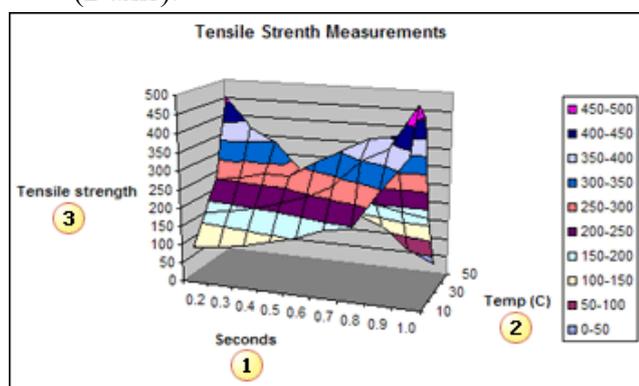
1. Select the data you want to display in a Stock chart. Make sure the data is arranged for the type of Stock chart you want to create, as described in the preceding table.
2. Click **Insert** → **Chart**. In the **Chart** type box, click **Stock**.
3. Under Chart sub-type, click the type you want to use. For a quick preview of the chart you are creating, click [**Press and Hold to View Sample**].
4. Click [**Next**], and continue with steps 2 – 4 of the Chart Wizard.

4.5 Surface Chart

A Surface chart shows a three dimensional surface that connects a set of data points. A Surface chart is useful when you want to find optimum combinations between two sets of data. Like a topographic map, the colors and patterns in a Surface chart indicate areas that contain the same range of values. Unlike other chart types, colors in a surface chart are not used to distinguish each data series. Instead, colors are used to distinguish the values.

When you use this data to create a Surface chart, it will be plotted as follows:

- The row headings (seconds) appear along the series axis (y-axis).
- The column headings (temperatures) appear along the category axis (x-axis).
- The data in the center of the worksheet (tensile strength) will be plotted along the value axis (z-axis).



4.5.1 Surface chart types

A Surface chart can be displayed in different ways by selecting the following chart sub-types:

- 3-D Surface – This chart shows a 3-D view of the data, which could be imagined as a rubber sheet stretched over a 3-D Column chart. It is typically used to show relationships between large amounts of data that may otherwise be difficult to see.
- Wireframe 3-D Surface – A variation of the 3-D Surface chart that appears in black and white. Without color in the surface, a wireframe chart shows only the lines.
- Contour – A Contour chart provides a 2-D view of the Surface chart from above, similar to a 2-D topographic map. The lines in a Contour chart connect interpolated points of equal value.
- Wireframe Contour – A variation of the Contour chart that appears in black and white. Without color in the surface, a wireframe chart shows only the lines.

4.5.2 Create a Surface chart

1. Select the data you want to display in a Surface or Contour chart.
2. Click **Insert** → **Chart**.
3. In the **Chart type** box, click **Surface**.
4. Under **Chart sub-type**, click the type you want to use. For a quick preview of the chart you are creating, click [**Press and Hold to View Sample**].
5. Click [**Next**], and continue with steps 2 – 4 of the Chart Wizard.

4.5.3 Changing the format of a Surface chart

Because the colors in a Surface chart are based on the values rather than the data series, you cannot select them in the chart itself. You can, however, select the corresponding color keys in the chart's legend, and then make the formatting changes you want in the **Format Legend Key** dialog box. Using this dialog box, you can:

- Change the colors and patterns used in the chart.
- Reorder the data series.
- Change the depth of the chart.

4.5.4 Format a Surface chart

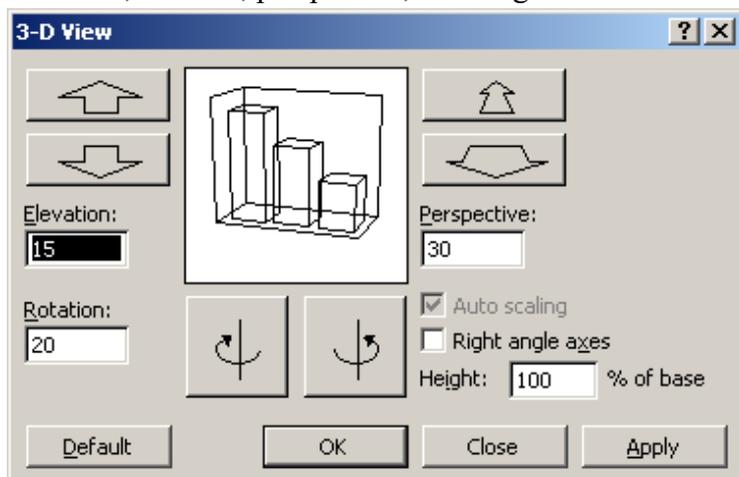
1. To display the legend, click **Chart** → **Chart Options**, and then select the **Show legend** check box on the **Legend** tab.
2. In the legend, click the key for which you want to change the format.
3. On the **Format** menu, click **Selected Legend Key**.
4. On the **Patterns** tab, make the color, border, or fill effect changes you want.
5. Repeat step 2-4 for each level you want to format.
6. To change the order of the data series in the chart, click the **Series Order** tab, click a series name in the **Series order** box, and then click the [**Move Up**] or [**Move Down**] buttons.
7. To change the depth of the Surface chart, click the **Options** tab, and then type a value between 20 - 2000 in the **Chart depth** box. By default, the depth of the Surface chart is set to 100.
8. To add a 3-D shading effect to the Surface chart, on the Options tab, select the 3-D shading check box.

You can see the effects of your changes in the preview box on the Series Order tab or the Options tab. The number of colors shown in a Surface chart is dependent on the scale settings of the value axis. Changes you make to a Surface chart may affect the size of the chart and those scale settings, showing more or fewer colors.

4.6 Changing Three-Dimensional Viewing Angles

The simplest way to change the viewing angle of a three-dimensional chart is to select one of the chart's corners and drag it with the mouse. While you're dragging, Excel displays an outline of the chart. This direct-manipulation approach is simple, but you also can easily turn an intelligible chart

into something quite the opposite. For more precise viewing-angle adjustment, choose **Chart → 3-D View**. The 3-D View dialog box, provides separate controls for modifying your chart's elevation, rotation, perspective, and height.



4.6.1 Adjusting the Elevation

The Elevation setting changes your viewing angle relative to the floor of the chart. The default setting is 15, and you can specify any value from -90 through 90 (With 3D pie charts, you're limited to values from 10 through 80). A setting of 90 places you directly above the chart, as if you were looking down on the tops of markers. With a 90 setting, you look up through the chart's floor (which, incidentally, is always transparent regardless of how you format it). To change the elevation, type a number in the Elevation box or click the large up or down arrow button in the upper left corner of the dialog box.

4.6.2 Changing the Rotation

Imagine that Excel has anchored your chart to a turntable. The Rotation setting spins the turntable. Technically, the rotation setting specifies the angle formed by the category axis and a line drawn horizontally across your screen. The default angle is 20° (pie charts = 0). You can specify any angle from 0 – 360 by entering it in the Rotation box or by clicking the clockwise and counterclockwise buttons to the right of the Rotation box.

4.6.3 Changing the Height

The Height setting changes a chart's value-axis-to-category-axis ratio. The default is 100%; you can select any value from 5 through 500. The higher the value, the taller your chart.

4.6.4 Changing the Perspective

The **Perspective** setting determines the apparent depth of three-dimensional area, column, line, and surface charts. The default setting is 30, but you can specify any value from 0 – 100. Low values make the chart look flatter, as if you were looking at the chart through a telescope or telephoto lens. High values have the opposite effect, making it appear as if you were looking through the wrong end of a pair of binoculars or through a wide-angle lens.

The default setting specifies that the far side of the chart is 30% smaller than the near side. This means that with a rotation of 0, the back of the floor is 30 percent narrower than the front of the floor. Similarly, if the elevation is 90, the bottom of the tallest column in a 3D column chart is about 30% smaller than the top of the column. To change the perspective setting, type a new number in the **Perspective** box or click the up or down arrow buttons above the **Perspective** box.

4.6.5 Changing the Axis Angle and Scale

The **Right Angle Axes** option sets the axes at right angles independent of chart rotation or elevation. To see axes in perspective, turn off this option. This option default as off for 3D column charts.

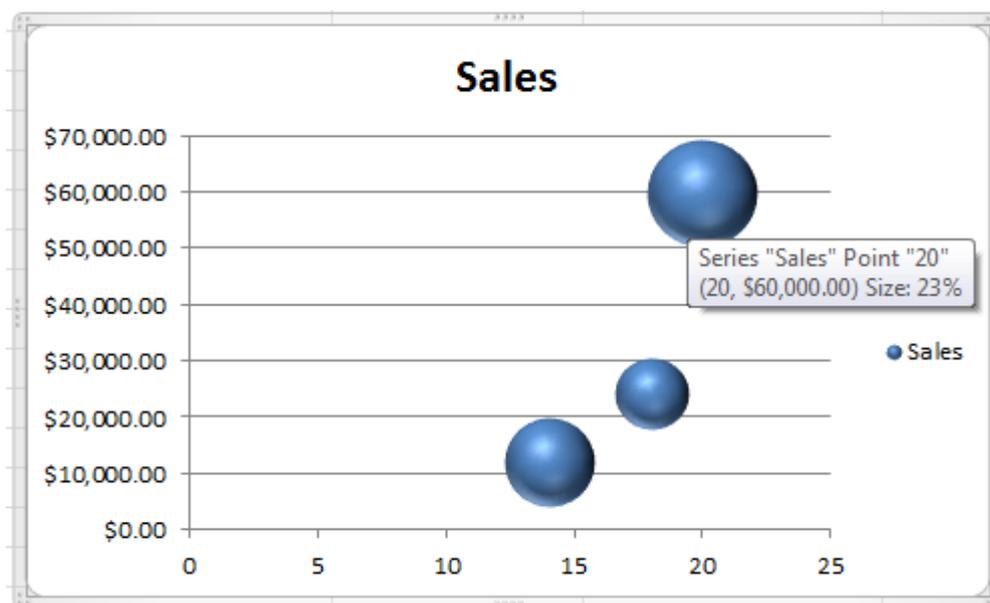
Auto Scaling is available only if you have the Right Angle Axes option selected. When you change a two-dimensional chart into a three-dimensional chart, Excel sometimes draws it smaller. For charts with right-angle axes and a rotation of less than 45°, the Auto Scaling option scales the 3D chart so it's closer in size to the two-dimensional version.

4.7 Bubble Charts

A Bubble chart is a variation of a Scatter chart in which the data points are replaced with bubbles. A Bubble chart can be used instead of a Scatter chart if your data has three data series, each of which contains a set of values. For example, the worksheet in the following picture contains values for three types of data: number of products, dollar value of sales, and percentage size of market share.

	A	B	C
1	Number of products	Sales	Market share %
2	14	\$12,200.00	15%
3	20	\$60,000.00	23%
4	18	\$24,400.00	10%

In a Bubble chart, the size of the bubbles is determined by the values in the third data series. For example, the following Bubble chart displays bubble sizes that correspond to the values in the third column of the sample data (Market share %).



Notice that the data in this Bubble chart is plotted as follows:

- Number of products is displayed along the horizontal (x) axis.
- Sales amounts are displayed along the vertical (y) axis.
- Market share percentages are represented by the size of the bubbles.

4.7.1 When to use a Bubble chart

Bubble charts are often used to present financial data. Use a Bubble chart when you want specific values to be more visually represented in your chart by different bubble sizes. Bubble charts are useful when your worksheet has any of the following types of data:

- **Three values per data point** – Three values are required for each bubble. These values can be in rows or columns on the worksheet, but they must be in the following order: x value, y value, and then size value.
- **Negative values** – Bubble sizes can represent negative values, although negative bubbles do not display in the chart by default. You can choose to display them by formatting that data series. When they are displayed, bubbles with negative values are colored white (which cannot be modified) and the size is based on their absolute value. Even though the size of negative bubbles is based on a positive value, their data labels will show the true negative value.
- **Multiple data series** – Plotting multiple data series in a Bubble chart (multiple bubble series) is similar to plotting multiple data series in a Scatter chart (multiple scatter series). While Scatter charts use a single set of x values and multiple sets of y values, Bubble charts use a single set of x values and multiple sets of both y values and size values.

4.7.2 Create a Bubble chart

1. Select the data you want to display in the Bubble chart. It's best not to include row or column headings in the selection. Otherwise, the chart may produce incorrect results.
2. Select **Insert** → **Chart**. In the **Chart** type box, click **Bubble**.
3. Under **Chart** sub-type, click the chart sub-type you want to use. For a quick preview of the chart you are creating, click **[Press and Hold to View Sample]**.
4. Click **[Next]**, and continue with steps 2 – 4 of the **Chart Wizard**. Note that smaller bubbles may be hidden by larger bubbles, making it seem that Excel has not drawn all of the data markers. When an entire data series contains negative bubble sizes, the series is not displayed by default. If you want to see the negative bubbles, select the series you want in the Chart Objects list on the Chart toolbar, and then click Format Data Series on the same toolbar. On the Options tab, select the Show Negative Bubbles check box.

4.7.3 Formatting Bubble charts

There are several ways to change the format of a Bubble chart:

- **Display bubbles with a 3-D visual effect** – By selecting the 3-D Bubble chart sub-type, bubbles are formatted with a 3-D visual appearance. A 3-D Bubble chart is 3-D in appearance only — it actually remains a 2-D chart type. Unlike other 2-D chart types, however, this chart

type cannot be used in a combination chart.

- **Adjust the size of bubbles** – The size of the bubbles can represent the area of the bubbles or the width of the bubble, which affects the relative size of one bubble to another. The Width of bubbles option can be used for representations such as market share between products. You can also scale the bubble size for a data series by specifying a percentage between 0 and 300 — the larger the percentage, the larger the bubbles.
- **Display error bars** – To graphically express potential error amounts relative to each bubble in a bubble series, you can display error bars for the X values, the Y values, or both.
- **Change the color and fill effects of bubbles** – You can assign different colors and fill effects (such as pattern, texture, and gradient) to individual bubbles or an entire bubble series.
- **Replace bubbles with pictures** – You can replace each bubble or all bubbles in a series with a picture. The size of the picture is automatically adjusted to match the bubble size for each corresponding value.

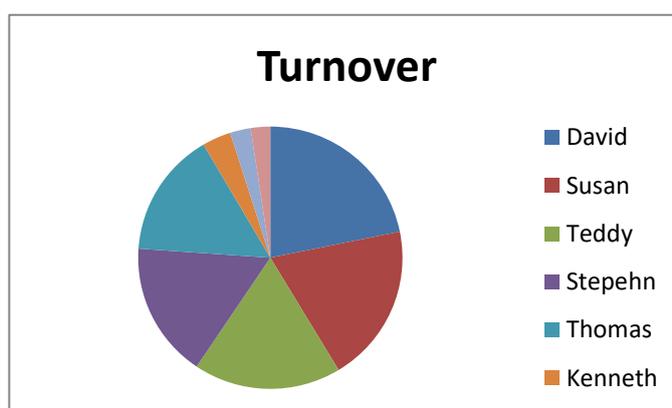
4.7.4 Change the Color and Pattern of Bubbles

1. In the Bubble chart, select a bubble or bubble series.
2. Click **Format** → **Selected Data Point** or **Format** → **Selected Data Series**.
3. On the **Pattern** tab, select the options you want.
4. To change the gradient, texture, or pattern of bubbles, click **Fill Effects**, and then select the options you want on the Gradient, Texture, or Pattern tab. To use pictures instead of bubbles, click the Picture tab, and then click Select Picture to insert the picture you want.

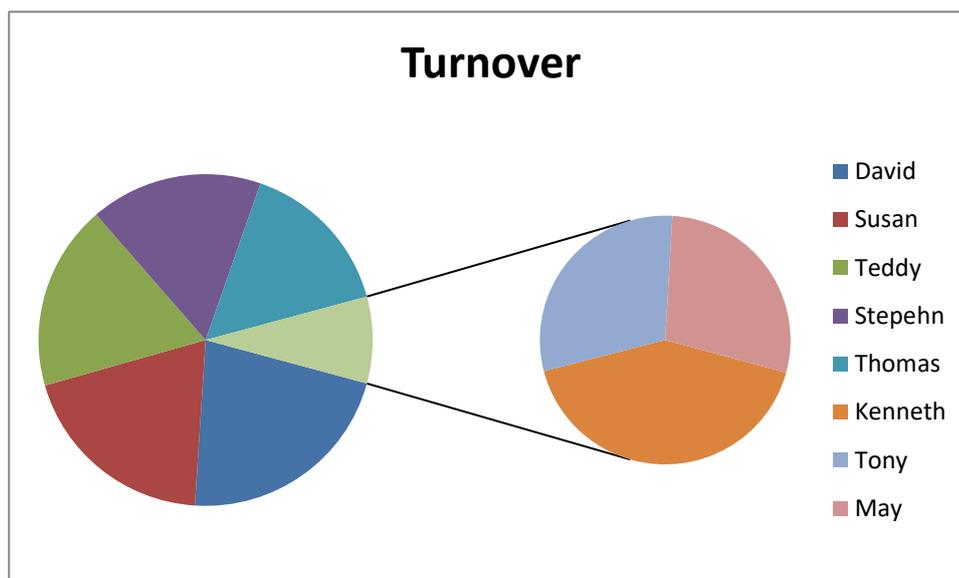
4.8 Pie of Pie and Bar of Pie Charts

Pie charts are excellent for displaying data points as a percentage of the whole. However, when several data points each amount to less than 5% of the pie, it becomes hard to distinguish the slices. For example, a pie chart of the following sales data contains three slices that fall below 5%.

Salesperson	Turnover
David	\$2,190.50
Susan	\$1,963.40
Teddy	\$1,814.88
Stepehn	\$1,676.00
Thomas	\$1,552.00
Kenneth	\$354.00
Tony	\$254.00
May	\$240.00



To make smaller slices more visible in a pie chart, Excel provides the Pie of Pie and Bar of Pie chart sub-types. Each of these chart sub-types separates the smaller slices from the main pie chart and displays them in an additional pie or stacked bar chart, as shown in the next picture.



Notice that the percentage labels in the secondary pie chart display the same numbers as in the regular pie chart. The numbers only represent the individual slices that were moved to the secondary chart; they do not total 100%.

4.8.1 Setting up your data and creating the chart

Pie charts can display only one data series, which means you can include only one column or row of values in your selection when you create a pie chart. You can also include a row or column of categories, as long as it is the first column or row in the selection.

When you select the Pie of Pie or Bar of Pie chart sub-type, Excel moves the last third of the data points into the secondary chart by default. For example, if there are nine data points, the last three points in your selection are plotted in the secondary chart. However, after the initial chart is created, you can change the number of data points in the secondary chart by changing settings on the Options tab of the Format Data Series dialog box.

4.8.2 Create a Pie of Pie or Bar of Pie chart

1. Select the data that you want to display in the Pie of Pie or Bar of Pie chart.
2. Click **Insert** → **Chart**.
3. In the **Chart** type box, click **Pie**.
4. Under Chart sub-type, click **Pie of Pie** or **Bar of Pie**. For a quick preview of the chart you are creating, click **[Press and Hold to View Sample]**.
5. Click **[Next]**, and continue with Steps 2 – 4 of the Chart Wizard.

Depending on how many decimal places are specified for percentages on the Number tab of the Format Cells dialog box (Format menu, Cells command), percentages that are displayed in data labels may be rounded so that they don't add up correctly.

4.8.3 Customizing the way data points are displayed

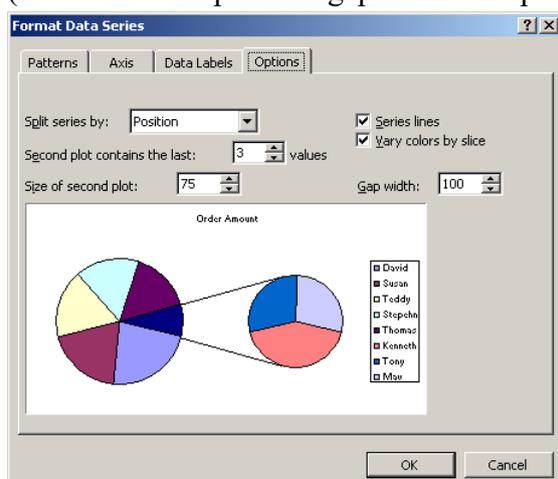
You can format specific chart elements of a Pie of Pie or Bar of Pie chart the same way you would in a regular pie chart. However, there are a few things that are unique to Pie of Pie and Bar of Pie charts:

- **Position of primary and secondary charts** – The primary and secondary charts are always positioned horizontally and adjacent to each other. They cannot be moved separately. The left chart is always the primary chart, but it's not always the larger of the two charts — the secondary chart can be larger than the primary chart.
- **Selection of primary and secondary charts** – You cannot select the individual charts or format them separately. Both primary and secondary charts are part of one data series. You can only select the entire data series or its individual data points, and then apply formatting to the selection.
- **Connector lines** – Connector lines are automatically added to emphasize the association between the two charts. You can format them by applying different line styles. You can also remove them if you need to.

4.8.4 Change Pie of Pie or Bar of Pie data series options

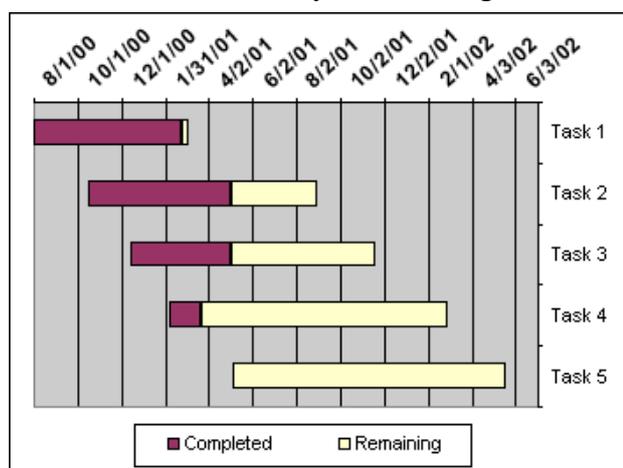
1. In the chart, select the entire data series. To select the entire data series, make sure nothing else is selected, and then click either of the charts once.
2. Click **Format** → **Selected Data Series**.
3. Click the **Options** tab.
4. To specify what kind of data you want in the secondary chart, click an option in the **Split series by** box.
5. To adjust the number of data points that appear in the secondary chart, do one of the following:
 - If you chose to split the series by position, change the number in the **Second plot contains the last [] values** box.
 - If you chose to split the series by value or percent value, change the number in the **Second plot contains all values less than** box.
 - If you want to customize the split of the data, close the dialog box, and then use the mouse to drag pieces between the two charts. The slice in the primary chart that represents the data in the secondary chart cannot be moved into the other chart. If you drag a slice from a pie chart without placing it in the other chart, space is created between the slices.
6. To change the size of the secondary chart, increase or decrease the number in the **Size of second plot** box (This number represents size as a percentage of the primary chart size).
7. To remove the connector lines, clear the **Series lines** check box.
8. To use the same color for all data points, clear the **Vary colors by slice** check box. You can change the color of individual data points. Select the piece that you want to change, and then, on the Format menu, click Selected Data Point. On the Patterns tab, under Area, click the color you want to use.

9. To change the space between the charts, increase or decrease the number in the **Gap width** box (This number represents gap width as a percentage of the secondary chart width).



4.9 Gantt Chart

There are many ways to create a Gantt chart. For example, Microsoft Project, a task-planning program, makes it easy to track and chart project timelines with a built-in Gantt chart view. Another option is to use Excel. Excel does not contain a built-in Gantt chart format; however, you can create a Gantt chart in Excel by customizing the stacked bar chart type.



4.9.1 Step 1: Enter the sample data

Open a new worksheet in Excel and enter the values in cells, then format with the date format you want to use for the chart by clicking Cells on the Format menu, and then clicking the Number tab. Click **Date** in the Category list, and select the format you want to use in the **Type** list.

Task	Start Date	Duration (days)	End Date
Task 1			
Task 2			
Task 3			

4.9.2 Step 2: Create a stacked bar chart

1. Select the data source, click **Insert** → **Chart** to activate Chart Wizard, and select **Stacked Bar** as the chart type
2. Remove all data series, and then recreate two data series:
 - Create a new series for the column of Start Date
 - Create a new series for the column of Duration
3. Press [**Finish**] to create the chart.

4.9.3 Step 3: Make the chart look like a Gantt chart

1. Double-click the first series in the chart. This is the series for **Start Date**.
2. On the **Patterns** tab of the **Format Data Series** dialog box, click **None** for **Border** and **None** for **Area**, and then click [**OK**].
3. Double-click the category (x) axis, which in a bar chart is the vertical axis. Click the **Scale** tab, and select the **Categories in reverse order** check box.
4. Double-click the value (y) axis, which in a bar chart is the horizontal axis. Click the **Scale** tab and type the following values in the appropriate boxes: **Minimum**, **Maximum**, **Major unit** and **Minor unit**.
5. Within the legend, select Start Date and then press [**Delete**].