

Creating Charts/Graphs in Excel

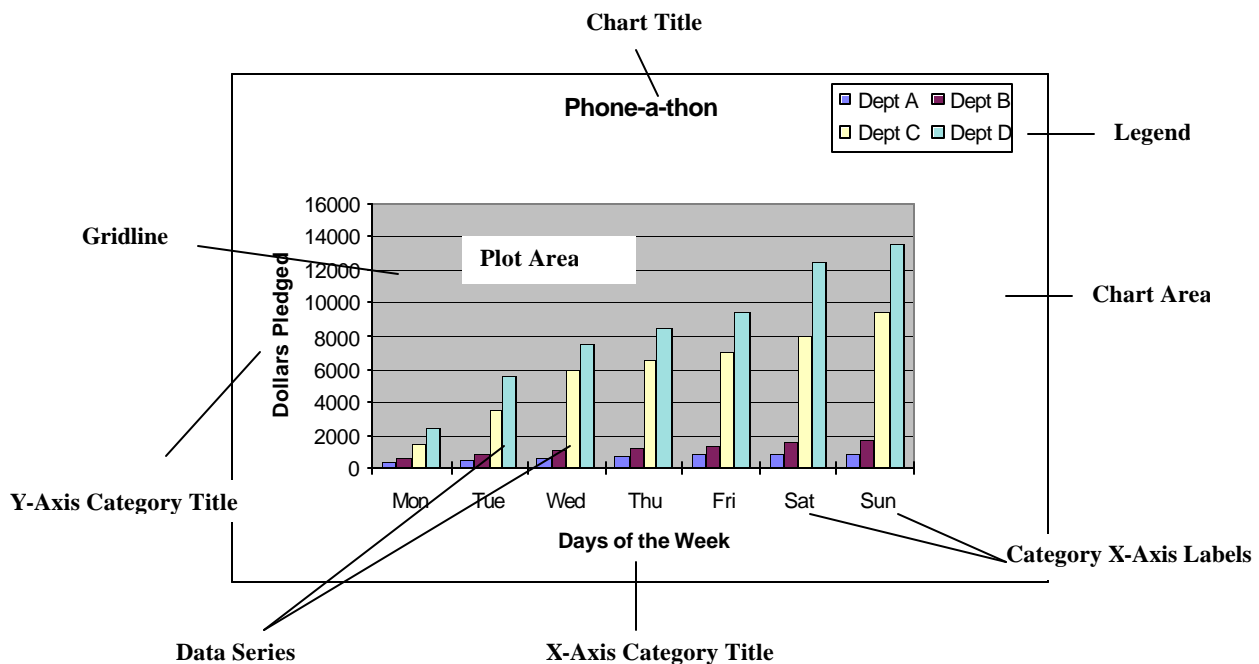
When you create a chart in Excel you will first enter the data on a worksheet and then proceed to create the chart. Excel automatically links the data to the chart so that if data is altered, added or deleted, the chart will update accordingly.

A few guidelines for creating charts:

- 1) Different chart types are suitable for displaying different data sets. For example, a pie chart only displays one series of data, and would therefore be unsuitable for trying to compare more than one data range.
- 2) Generally speaking, simpler is better. Cluttering a chart with unnecessary data or too many additional objects may dilute the message you are trying to present with a chart.
- 3) You may need to consolidate some of your data in order to effectively present it in a chart. For example, you may want to present subtotals for your categories rather than plotting individual data items. Using the built-in subtotals feature of Excel (**Data, Subtotals**) can often be useful in summarizing the data before plotting it.
- 4) Charts may be created in Excel and then pasted into other applications such as PowerPoint or Word. A chart may optionally be pasted as a link so that if the data changes in Excel, the chart's view will update in any other application where it was pasted.

Chart Terms

You should be familiar with chart terminology so you will know the name of the object you wish to modify/add, etc. A typical style of chart would have an X-axis (usually horizontal) and a Y-axis (vertical). Below is a chart with its main aspects labeled.



Creating a Chart

There are several ways to create charts in Excel. You can activate the **Chart Wizard** by clicking on its button on the Toolbar or by choosing **Insert, Chart** from the menu. You will have the choice of embedding the chart in the active sheet along with the data, or you can add the chart to its own separate chart sheet. Selecting the data and pressing **F11** will create a chart automatically (no wizard) and by default locate the chart on a separate sheet.

If you use the Chart Wizard, it will step you through four dialog boxes, each of which corresponds to a menu item on the **Chart** menu. The four screens are: **Chart Type, Chart Source Data, Chart Options, Chart Location**.

Types of Charts

Below are some general guidelines for selecting the best type of chart for the data you wish to present.

Column	Shows data changes over a period of time or illustrates comparisons among items
Bar	Illustrates comparisons among individual items
Line	Shows trends in data at equal intervals
Pie	Shows proportional size of items that make up a data series; only shows 1 data series
XY (scatter)	Shows relationships among numeric values in several data series or plots two groups of numbers as one series of XY coordinates.
Area	Emphasizes the magnitude of change over time
Doughnut	Shows the relationships of parts to a whole, like a pie, but can contain >1 data series
Radar	Each category has its own value axis radiating from the center point
Surface	Shows optimum combinations between two sets of data (like a topographic map)
Bubble	Type of scatter chart; compares 3 sets of values with the 3 rd displayed as a size of a bubble
Stock	Measures volume and has two axes; one for measuring volume, the other for stock prices
Cone, cylinder & pyramid	Creates the specified effects by using shaped data markers in 3-D column and bar charts

Changing Data in the Worksheet

Once you have created a chart, the data points are automatically linked to the worksheet values they represent. If you need to change a value in an existing chart, you can change the worksheet contents directly. The chart is updated accordingly.

For many chart types, you can also change a value in both the chart and the worksheet *by dragging the data marker on the chart*. If the data marker reflects a cell that is not associated with a formula, then the data sheet will change to reflect the change you made on the graph. If the data marker *is* associated with a formula, then the **Goal Seek** dialog box is displayed for you to enter a cell reference for a value in the formula that needs to be adjusted.

Another option is to re-activate the wizard for that particular chart so you can make your changes. To do this, select the chart and click the Chart Wizard button. Make your changes and click **Finish**.

STEP 1: CHART TYPE

Before you start the **Chart Wizard** you may optionally choose to select the data you wish to plot first. If you do not select it now, you may do so in the second window of the wizard.

Select the cells that contain the data and text you want to include in the chart. Select both the numeric data and adjacent row and column headings. Make sure there are no blank rows or columns between the title and category headings and the body of the data or Excel will plot the blank spaces.

Plotting Nonadjacent Selections

Sometimes the data you wish to plot are in rows or columns that are not in adjacent columns or rows. To select and chart nonadjacent selections, begin by selecting cells in the first row or column. Hold down the **CTRL** key as you select nonadjacent areas. Then choose the **Chart Wizard** to continue creating the chart.

STEP 2: CHART SOURCE DATA

The **Data Range** tab lets you choose to orient your chart by Rows or Columns and also allows you to change the data range if desired.

The **Series** tab will let you select which labels appear on the X-axis. You can make alterations that will let the data headings in either rows or columns serve as labels appearing on the X-axis.

By default a data series is one category of your table. You can emphasize either the row or column data and may change back and forth within the Chart Wizard to select the best view.

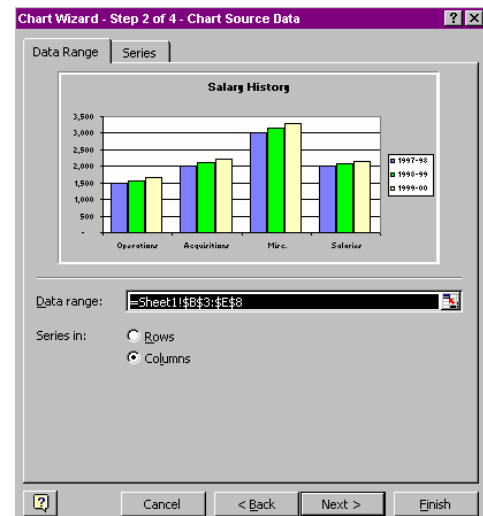
To change the order in which series are plotted, select the **Series** tab. Specify the order you want by moving the series up and down in the list box.

Adding Data

There are two ways you can add data to an embedded chart on a worksheet:

1. select the data on the worksheet and drag it onto the chart. This is the faster way; it's equivalent to using the Copy and Paste commands;
2. use the **Chart** menu and select **Add Data**.

When adding data points to a data series, you can add the category name along with the data by including it in the selection that you add to the chart.



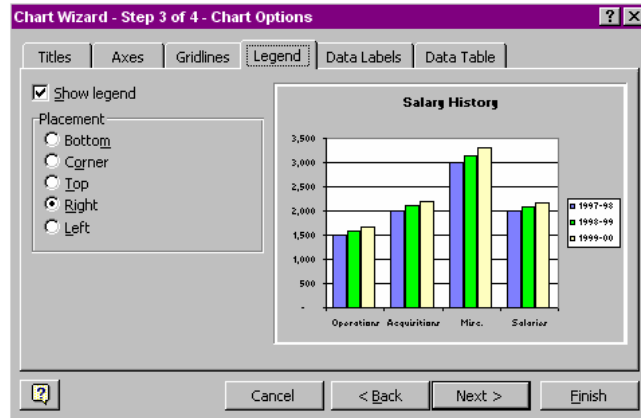
STEP 3: CHART OPTIONS

To modify chart options such as **titles**, **axes**, **gridlines**, **legends**, **data labels**, or to add the **data table**, go to Step 3 of the **Chart Wizard**, or choose **Chart Options** from the **Chart** menu.

Titles

You can add titles to the chart as well as titling both the X and Y-axes. You will probably want to name the value (Y-Axis) as well. The X-axis is often self-

explanatory. However, the Y-axis can be confusing unless the unit of measure is clearly labeled.



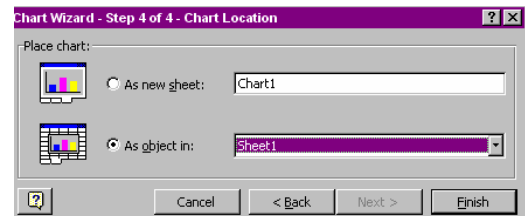
Changing Chart Text

When you create a chart, the data labels, legend entries, and axis tick-mark labels are created from and automatically linked to the worksheet selection the chart is based on. It is usually easiest to make changes to this text by editing cells on the worksheet. You can edit data labels directly in the chart, although this breaks the automatic link.

If you have added a chart title, axis titles, or text boxes (“floating text”) to your chart, you can select this text and type new text to replace it, or place the insertion point and edit it directly in the chart. Vertically aligned text is displayed horizontally until you are finished editing it.

STEP 4: CHART LOCATION

To change the location of the chart, reactivate the wizard by selecting the chart and clicking on the **Chart Wizard** button or else by choosing **Chart, Location** from the menu. You can then choose to include the chart with the data or have it embedded on a separate sheet.



Moving & Sizing a Chart

Once you have created a chart, you can move it, size it, or copy it to other areas. To size the chart, drag the sizing handles until the chart reaches the desired size. To move it, simply click on the chart until you see sizing handles around it and drag to another location. To move it to another sheet, select the chart, choose **Edit, Cut**. Go to the new location, position the cursor and choose **Edit, Paste**. (If you wish to create a live link between the data and the copied chart, be sure to choose **Edit, Paste Special** in the new file or application where you are pasting the chart.)

Changing the Chart Type

If you wish to change the type of chart, simply select the chart and click on the **Chart Wizard** button. This will open the Wizard where you may select a different style of chart.

Changing the Plot Order of Data Series

You can change the order in which the series are plotted for data series within the same chart type group (other than radar charts). From the **Chart** menu, choose **Source Data** and select the **Series** tab. Specify the order you want by moving the series up and down in the list box.

Formatting Chart Elements

Before you can select and modify any chart item, the chart must be activated. Click on a chart to select it. You will see “selection” handles added to the border indicating it is active. After activating the chart, you can move, modify, and size various elements of your chart such as titles, data labels, and pie and doughnut slices by selecting and dragging them. You can move and resize the plot area, the legend, and any graphic objects, such as text boxes and arrows that you have created.

When the chart is active, the **Chart** toolbar should appear. If it doesn't, right click on any toolbar and choose **Chart** from the list of those available. The **Chart** toolbar provides quick access to many formatting properties.

To format an area of the chart such as the axis or title, click the item.

To easily select the chart element you want, you may optionally use the **Chart Toolbar** to select items from the chart objects drop-down list.



Once it is selected, you can format it by right-clicking on the object and choosing **Format** or click the **Format** button from the Chart toolbar.



Deleting a Chart or Deleting an Element in the Chart

To delete a chart, click on it to select it, then press the **Del** key on your keyboard. The same process will work to delete any chart element such as a data series, legend, or title. Click on it to select it, then press **Del**.

Printing a Chart

You can choose to print a chart by itself or print it with the worksheet data. To print a chart by itself, select the chart and choose **File, Print**. To include the chart with the worksheet data, simply select the data and the cells underneath the chart before going to the **Print** menu.

Using Drawing Tools with Worksheets and Charts

You can put graphic objects on worksheets and charts to emphasize cells, add interest, add text, etc. The objects are not actually part of the worksheet or chart but are inserted on a transparent layer. These objects can be moved, sized, and formatted independently of the data or chart underneath or they may be grouped together with the chart.

To display the **Drawing Toolbar** (if it is not already visible), *right-click* on any toolbar and choose **Drawing** from the list of available toolbars. You can then draw objects such as circles, arrows, squares, etc. to highlight data in your spreadsheet.



Note: if you double-click a button, it will remain "sticky". In other words, you can continue to use that tool multiple times without re-selecting it.

AutoShapes

PowerPoint also comes with a number of predefined shapes called AutoShapes. Select the AutoShapes button on the toolbar and select the shape to insert. AutoShapes include arrows, lines, connectors, flow chart symbols and more.

Grouping, Ungrouping, and Regrouping Objects

You can group objects together so you can control them as one unit. For example, if objects are grouped and you change the color, the fill color will change for all of them.

To group a set of objects:

Hold down the SHIFT key and click to on each of the objects to be included in the group.


Click on the **Draw** button and select **Group**.

To ungroup a set of grouped objects:

- 1) Select the group by clicking on it.
- 2) Click on the **Draw** button and select **Ungroup**.

Manipulating Objects



From the **Draw** button, you can choose options to manipulate objects. Any PowerPoint object can be flipped horizontally or vertically and rotated left or right using options on the **Draw** button. Objects can also be rotated in any direction, at any angle, using the **Free Rotate**  tool.

Copying a Chart

To copy a chart to a new location or other application, click on the chart and choose **Edit, Copy**.

To simply paste the chart in another sheet, workbook, or Windows application (such as PowerPoint or Word), open the receiving document and choose **Edit, Paste** from the menu. If you wish to paste the chart as a link, meaning that the chart will automatically update to reflect any changes in the original chart and/or data, then choose **Edit, Paste Special**, then **Paste Link**.

Inserting Charts in PowerPoint



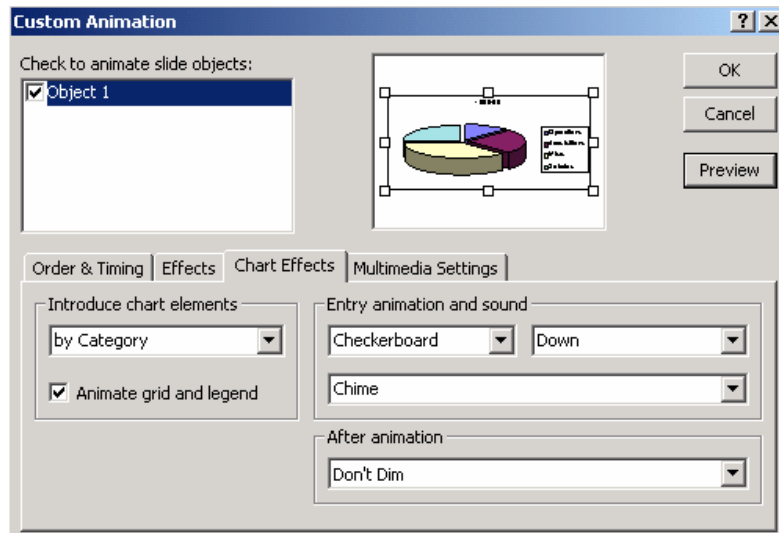
Charts are stored in your PowerPoint presentations, not in separate files. To insert a chart, click the **Insert Chart** button (or create a new slide and choose the sample that includes a chart object). A sample graph and worksheet appear where you can type your own data into the worksheet.

You also can import data from an ASCII file that separates fields with either comma or tab characters, or from an Excel or other type of spreadsheet. With the default chart and datasheet showing, choose **Edit, Import File**.

Animating your Chart in PowerPoint

You can animate text, graphics, sounds, movies, chart elements, and other objects on your slides so you can focus on important points, control the flow of information, and add interest to your presentation.

To animate chart elements, You can also change the order and timing of your animations, and you can set them to occur automatically without having to click the mouse. To set up and preview the animation of your text and objects, click **Custom Animation** on the **Slide Show** menu.



Multiple Chart Types (Bar/Line Combined)

To assign a chart type to a data series, first select the data series, and then choose the **Chart Type** command from the **Format** menu. To make other changes, such as changing the subtype or the other series order, choose the **Options** button after changing the chart type. **Note:** You cannot combine chart types when using 3-D charts.

Adding a Trendline to a Data Series

You can add a trendline to a data series in a chart to show the trend, or the direction, of the data in the series. Trendlines are commonly used to study problems of prediction, also called *regression analysis*. They are also frequently used to show *moving averages*, which smooth fluctuations in data to show the pattern or trend more clearly.

The first step in creating a trendline is to **select the data series** that you want the trendline associated with. Then choose **Add Trendline** from the **Chart** menu. On the **Type** tab, select the type of trendline you want.