

Chemistry Foundations: Using Microsoft Excel for Drawing Graphs

Microsoft *Excel* lets you create graphs as a way of summarizing and representing data. Essentially, you enter the data to be graphed, you create the graph, and then you edit the graph so that it appears as desired. The graph and the data can both be stored as one spreadsheet.

While many types of graphs can be created very easily, the type of graph must be appropriate to the data. Here are some rules of thumb:

- ◆ use a line graph to depict trends
- ◆ use a column graph to show relative quantities
- ◆ use a pie-chart to show the relative share of a whole

Do not simply use the default graph created for you. Use the editing features to vary line types and thickness, textures, and type characteristics. Use this variation to emphasize the message to be conveyed by the graph.

How to begin

Turn on the computer and choose the excel icon from the desktop or from the Microsoft office folder. Double click the icon to launch the program. The computer will now open the Excel application and a table will appear in the window with tool bars above. This is called a blank workbook.

Graph 1: Pie Chart

1. Enter the sample data below. Click on cell A1 to make it active. Type in "Element". Tab over or use your arrow keys to click on Cell B1. Type "Mass". Notice that as you type the letters appear in the cell and in the formula bar. The formula bar tells you where you are and allows you to edit any cell. Cells are identified by column letter and row number. You can edit any cell by clicking on the cell and then moving your mouse up to the formula bar, clicking there and editing as you would a word document.

Mass Composition of Glucose

Element	Mass (g)
Carbon	72
Hydrogen	12
Oxygen	96

2. You may wish to edit the column width in your workbook. This can be done by placing the mouse on the line between the columns at the very top, until it changes to a black cross. Then simply drag the column to the desired width.
3. Drag across the data you wish to graph. This does not include column labels. Drag from Carbon down to 96. Both columns should be highlighted. (although the 1st cell does not appear to be highlighted, it is)
4. Now choose the chart wizard icon. It looks like a vertical bar graph with blue, red and yellow bars.
5. You will be greeted by a series of choices. Select pie chart for the first data set.
6. Click **next** and go through the series of screens. Add a title and edit this graph as you choose.

Graph 2: X-Y scatter plot with trend line

1. Open a new workbook using the tab at the bottom of the screen.
2. Enter the second set of sample data.

Mass vs. Volume

Mass (g)	Volume (cm ³)
54.4	20.1
65.7	24.15
83.5	30.9
105.7	39.1

3. Drag across the second set of data you want to graph. Drag from mass down to 39.1.
4. Choose the chart wizard icon
5. Select x-y scatter plot for this set of data. Next you specify the appearance of the graph. Choose type #1 (dots only). A sample graph will now appear. If you are not satisfied with it, you can go back and change previous options.
6. A window with "data range" will appear, just click "Next"
7. Give your graph a title, label including with units.
8. Click on the "Legend" tab and de-select "show legend" then click "Next"
9. A screen will appear for chart location. Select "As object in" and click "Finish"
10. Double click on the x axis and change the data range by choosing "Scale" under formatting axis. Insert a minimum and maximum that make sense for your data. Do the same for the y axis.
11. Inserting a best-fit line: Select the data series by single clicking on the dots. Next, on the menu, go to "Chart" on the top menu and select then "Add Trendline". Under Type, specify linear.
12. Making changes to an existing graph:
 - Clicking once on a graph will allow you to move/resize the graph.
 - Double clicking on a graph will allow you to make various changes to the graph's style.
 - You can also add graphical annotations to the graph you created. Click on the tool to open the drawing palette. Use the tools to draw lines, arrows, text, and other annotations on your graph.
 - You can change the size of the chart by dragging the black boxes on the edges of the chart. You can re-position it by simply dragging it.

Graph 3: Triple line graph

1. Open a new workbook using the tabs at the bottom of the page.
2. Enter the data below. (Use "shift" + "option" + "8" to make the ° symbol)
3. Drag to select from "Temp in Los Angles" down through 17" Do NOT select the top line of the data table or you will get an extra line on your graph with days 1-10
4. Go to the char wizard and select "line graph"
5. Give the chart a title and label the axis, including units.
6. Edit the legend so that it only includes the city name. You can move the legend by clicking on it and dragging it to a new location.

Average Temperature in 3 major West Coasts Cities

Time (days)	1	2	3	4	5	6	7	8	9	10
Temp in Los Angles (°C)	28	29	22	27	26	27	29	31	30	24
Temp in San Francisco (°C)	18	22	20	17	21	21	20	18	21	19
Temp in Portland (°C)	11	10	14	13	15	16	15	11	15	17

Printing your graph

You have two main options when printing your graph based on the size of graph desired.

- To print a full page graph, select the graph only by clicking on it. There will be black squares in the corners of the graph. This will print the graph only.
- To print a smaller graph and data table, do not select the graph. (Click outside the graph and make sure that the black squares are gone) The graph should be placed all the way over to the left hand side of the worksheet and below the data table