

VALENCIA COLLEGE

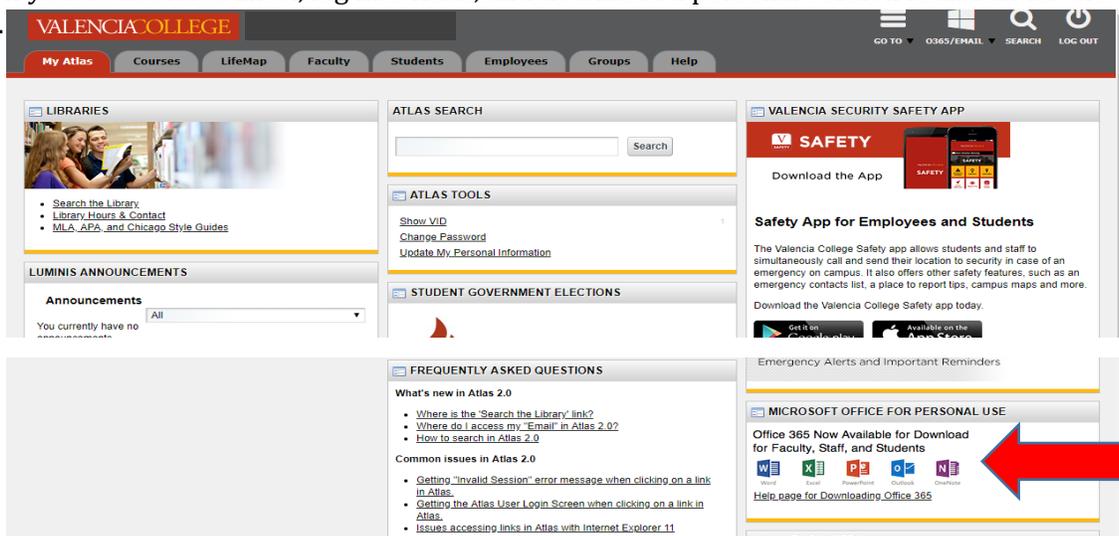
Chemistry

Appendix #7: Creating a Graph in Excel: Straight-Line Graph

Graphing data using a computer-graphing program can make the graphing process easier and visually more attractive. This tutorial is a “crash course” on creating an X-Y scatter graph using Microsoft Excel. Links at the end of this document provide additional information if you want to learn more about Excel.

1. Enter data in Excel:

- a) Open Excel. If you do not have Excel, log into Atlas, and download a personal version found under the MyAtlas tab.



- b) Enter the “x” values on the A column and the corresponding “y” values on the B column.

Example:

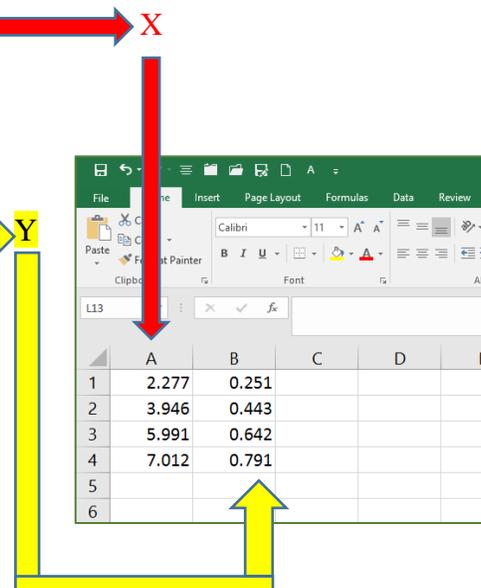
Data:

Table 1: Change in Temperature of solutions containing 5.00 g of HCl dissolved in 100.0 mL of water after the addition of solid NaOH

	Test 1	Test 2	Test 3	Test 4
Mass of NaOH (g)	2.277	3.946	5.991	7.012
Initial Temperature of HCl Sln (°C)	23.175	23.175	23.175	23.175
Final Temperature of HCl Sln (°C)	23.426	23.618	23.817	23.966
Δ Temperature (°C) of HCl Sln	0.251	0.443	0.642	0.791

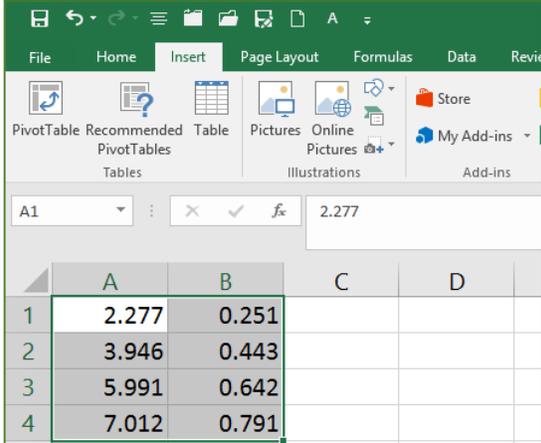
Note:

- Do not enter units of measure. Do not enter spaces or letters, only enter numbers.
- Enter scientific notation using e.
Example, Avogadro's number, 6.022×10^{23} , should be entered as 6.022e23.

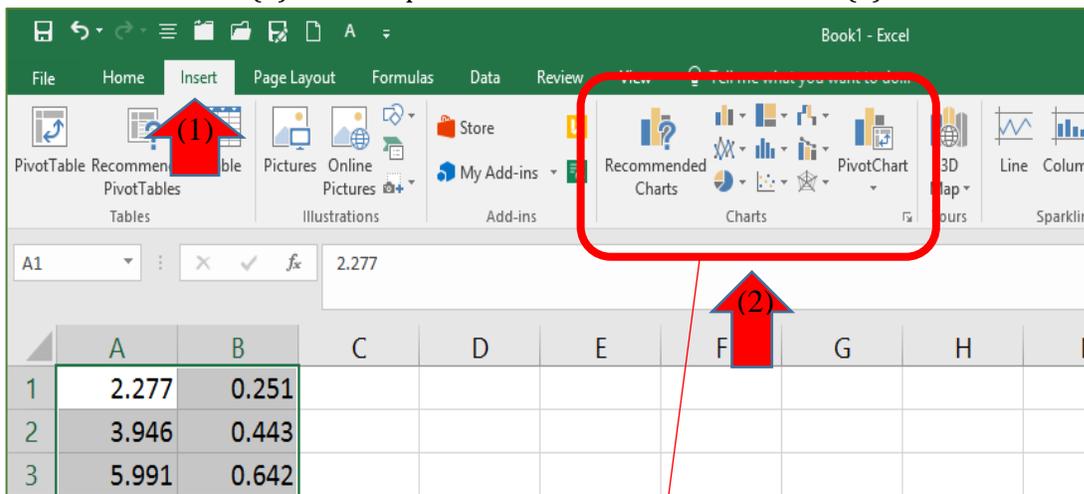


2. Create the graph.

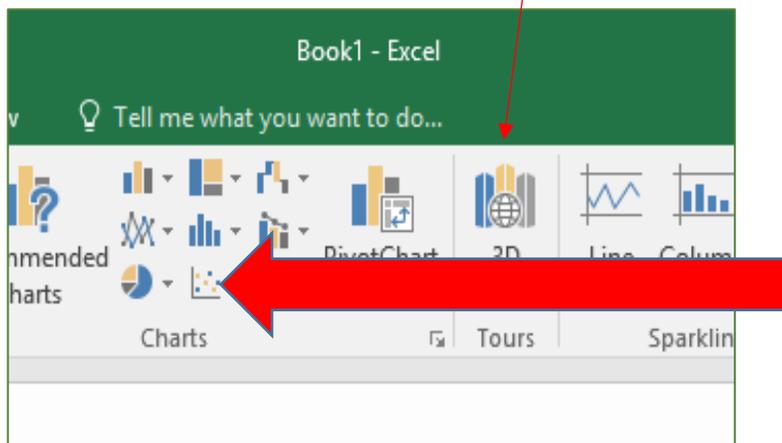
a) Highlight the data set,



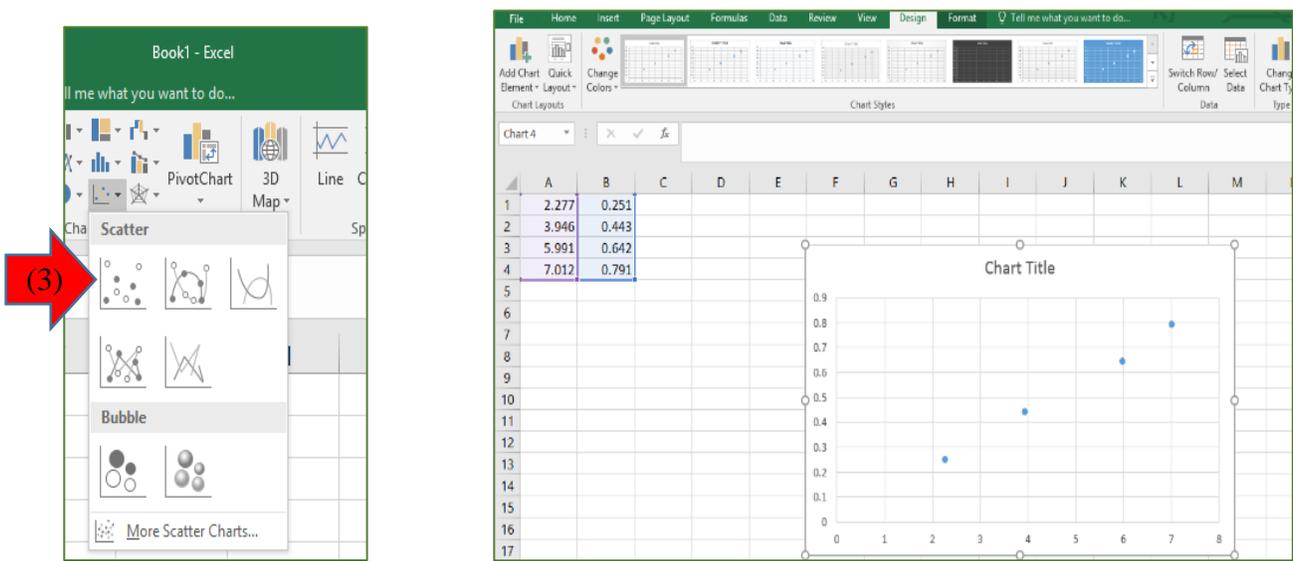
then select "Insert" (1) on the top tool bar to see the "Charts" menu (2).



b) Click on the symbol for "Insert (X, Y) or Bubble Chart" within the "Charts" menu.



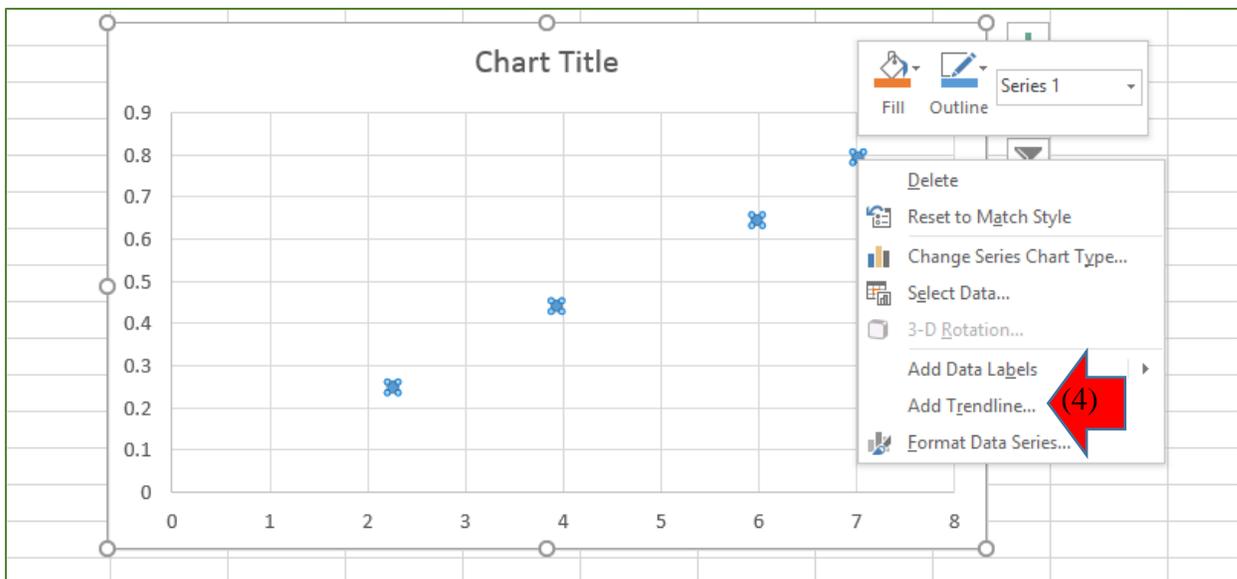
c) Select the option on the far left (3) and the graph will appear.



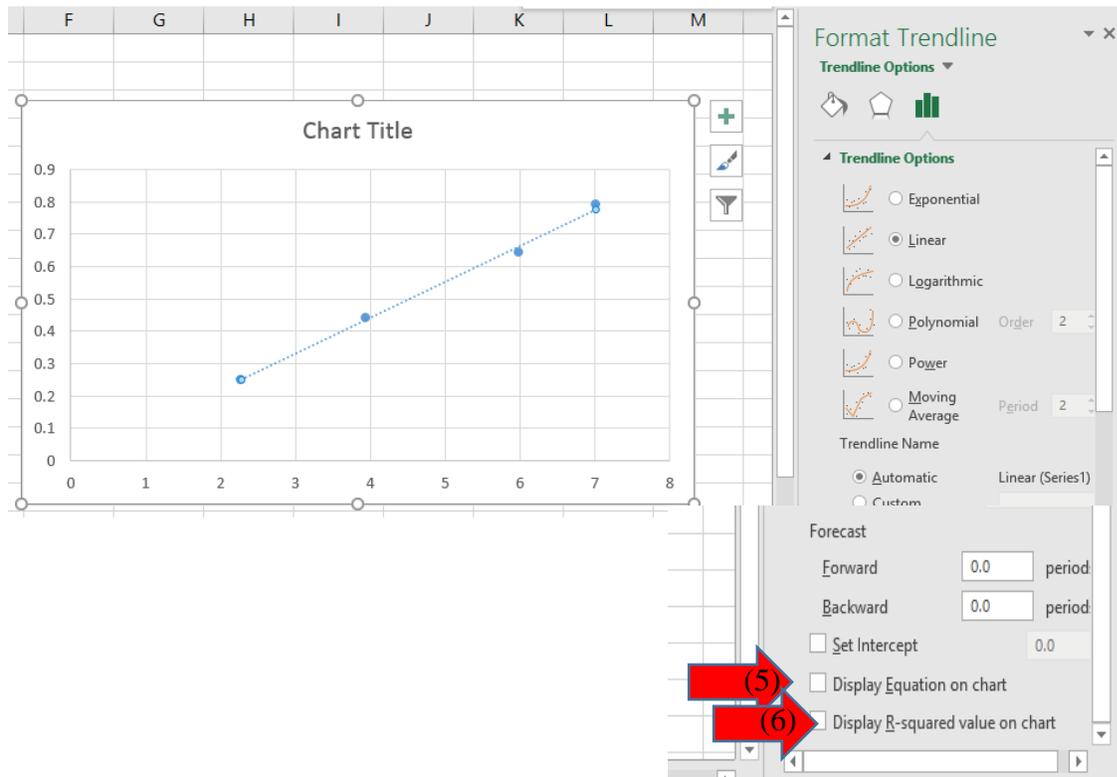
3. Add trendline, R², and line equation:

All data has a degree of uncertainty caused by errors. Linear regression (also called curve fitting or trendline) is a mathematical technique that attempts to minimize the errors of the data by quantitatively estimating the trend of all of the data points. After performing a linear regression, it is important to determine how well the data compares to the trend. The correlation coefficient, R² provides this comparison. An R² value of 0.99 or higher indicates that the trend is a very good representation of the data.

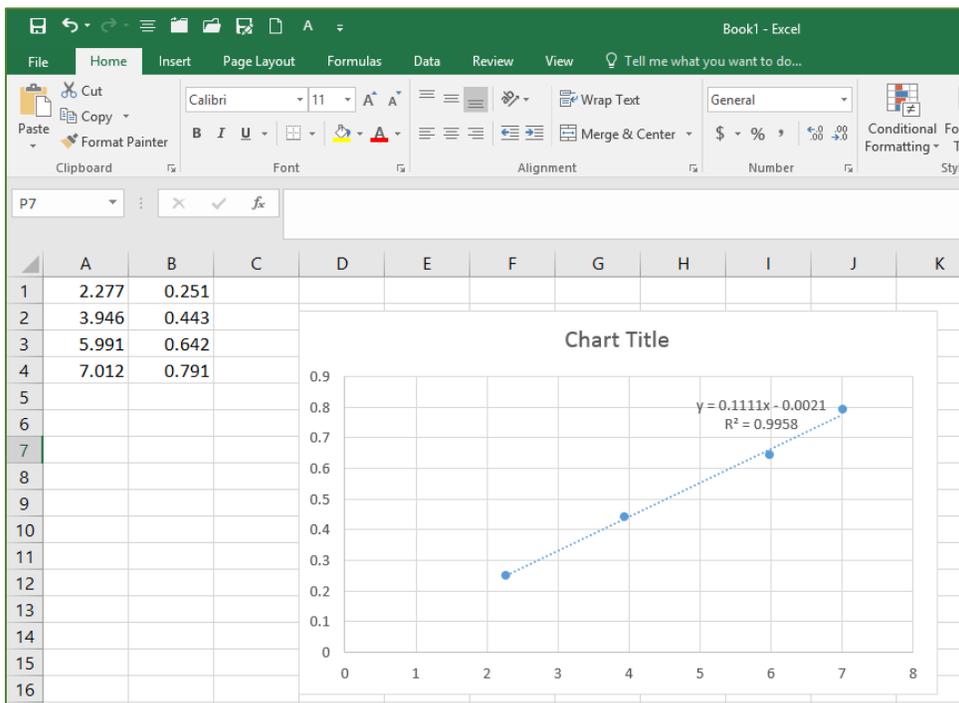
a) Right-mouse click on any data point on the graph; select “Add Trendline” (4) to open the “Trendline Options” menu.



b) If the data is linear, the Linear option will be automatically selected. Scroll down the Trendline Option menu to select “Display Equation on chart” (5) and “Display R-squared on chart” (6).

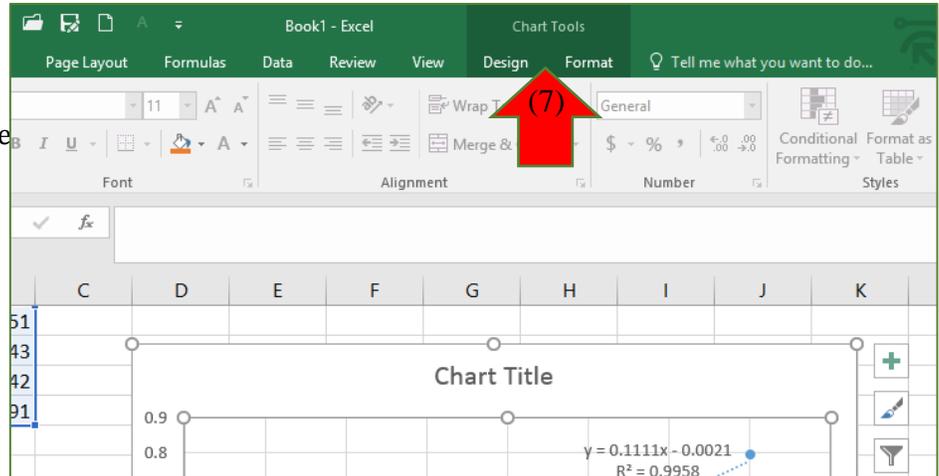


c) The line equation and R² can be repositioned by clicking on it and dragging the box.

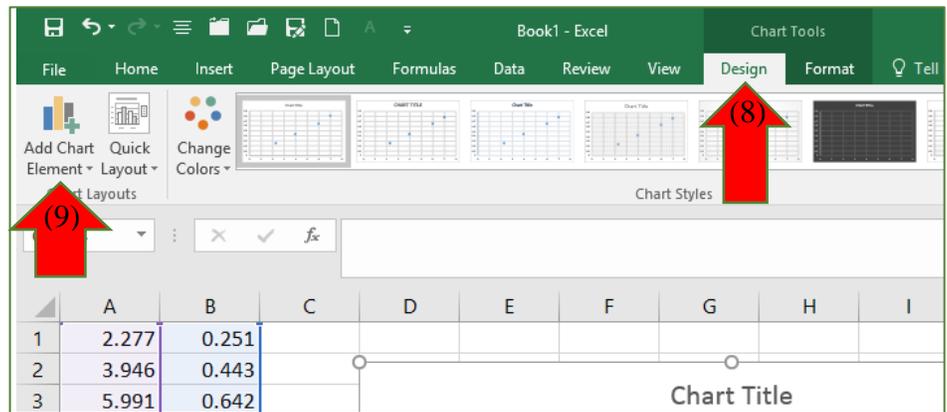


4) Adding titles.

- a) Click on the graph to see the “Chart Tools” (7) options.

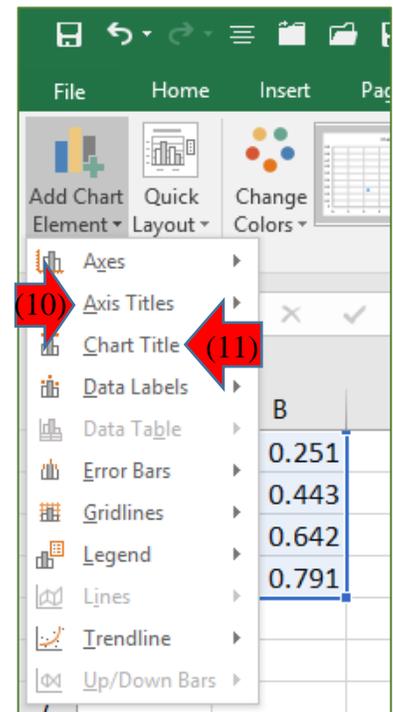


- b) Select “Design” (8) from the “Chart Tools” menu, then select “Add Chart Element” (9).

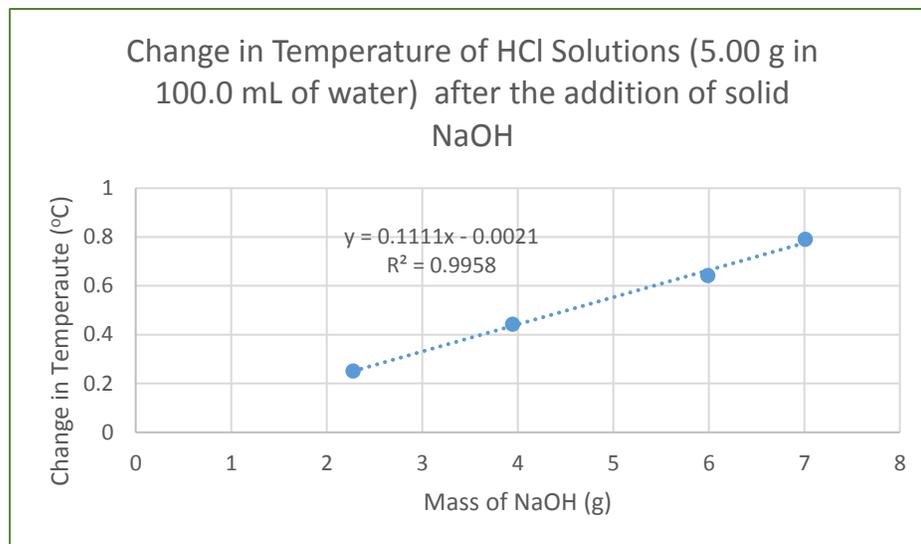


- c) Select Axis Titles (10) to enter titles for the x-axis (Primary Horizontal), and the y-axis (Primary Vertical). Make sure you include units of measures for each axis, if applicable.

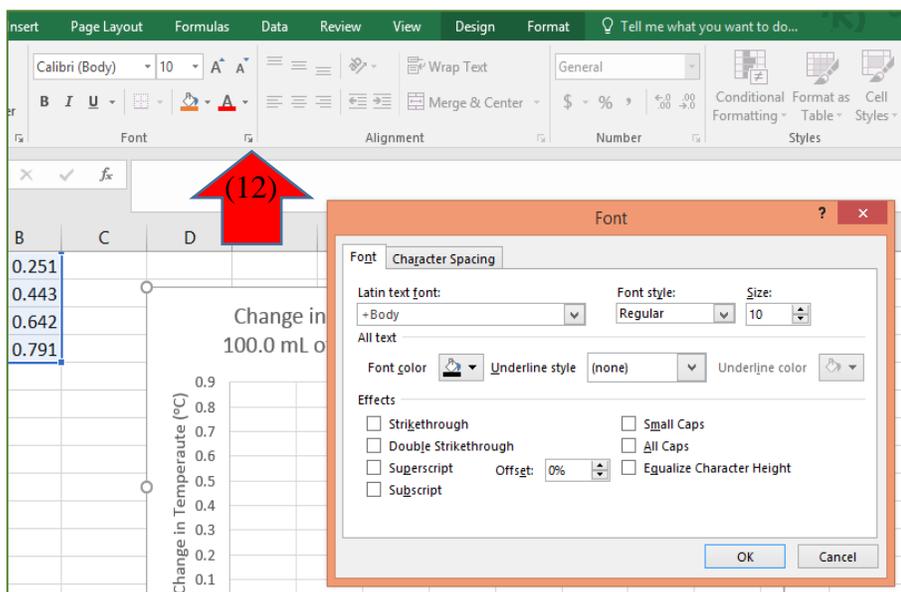
Also select Chart Title (11) and enter one in the textbox above the graph. A good title will allow people to understand what is plotted without having to ask. If the graph title includes the axes measurements, it should be stated as “Y” versus “X”. However, make sure to include additional details. Think of the title as a short story that presents the essential details of what is being presented.



Example:



Note: To apply superscripts or subscripts, highlight the character and click on the arrow in bottom corner of the Font menu (12) to see more “Font” options. Click on the option desired, then click OK.



5. Print graph. It is usually not necessary to print the Excel data table, particularly if it appears somewhere else in your report. Click on the graph, select File (top left), Print. Within “Settings”: Print Selected Chart.

If you would like additional information on Excel, visit the following websites:

1. Creating a Scatter Plot
 - a. tutorial: <http://www.dummies.com/software/microsoft-office/excel/how-to-create-a-scatter-plot-in-excel/>
 - b. video: <https://www.youtube.com/watch?v=eMEhjbhtfxQ>
2. Simple Calculations in Excel
 - a. tutorial: <http://chemed.chem.purdue.edu/genchem/lab/datareports/excel/intro.html>
 - b. tutorial: https://web.iit.edu/sites/web/files/departments/academic-affairs/academic-resource-center/pdfs/Excel_Chem.pdf