

## 105a google graphing

**(20pts) Part 1: Analyzing data and creating graphs:**

In this activity you will make graphs in a google spreadsheet, insert into a google document and write a figure legend.

- 5pts) for figure 1 graph
- 5pts) for figure legend
- 5pts) for figure 2 graph
- 5pts) for figure legend

Experiment: The effect of magnesium chloride on plant growth by measuring the stem length after 7 days (concentration of magnesium chloride is 10g/100ml for each sample)

45.3cm	50.4cm	101cm	125cm	150cm	228cm
100ml	200ml	300ml	400ml	500ml	0ml

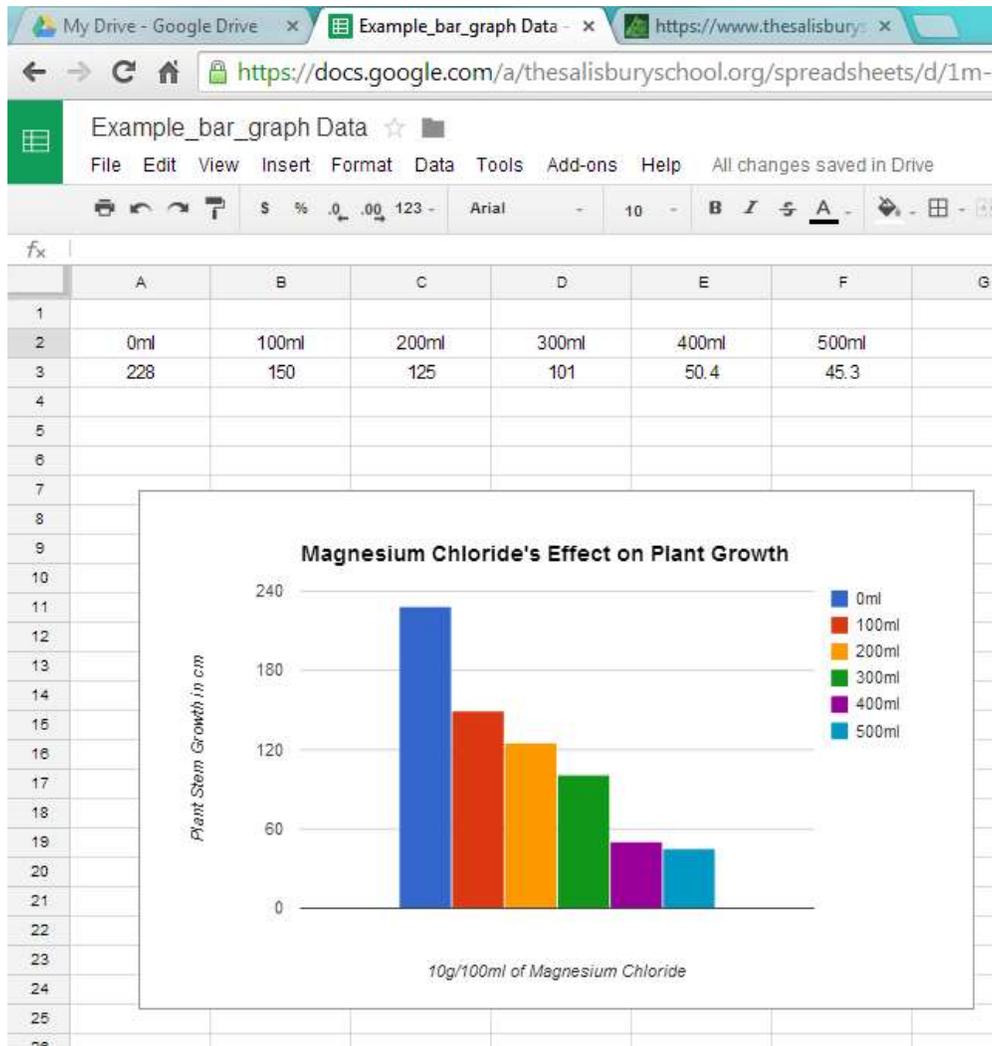
Although the data is presented, it is hard for observers to visually determine the effect that magnesium chloride had on the growth of the plant. This can best be illustrated using a graph. We will be using google spreadsheets to create all of your graphs, because changes in data or format is easy to accommodate.

There are two main ways graphs will be displayed in your project.

- **Bar Graphs** - display data visually (preferably) vertically and allows viewers to compare items displayed. Data displayed will relate to things like amounts, characteristics, times and frequency etc. A bar graph displays information in a way that helps us to make generalizations and conclusions quickly and easily.
- **Line Graphs** - use points connected by lines to show how something changes in value over time (Time is typically depicted on the X axis.) For instance, students might use a line graph to depict how the average daily temperature (or isotherm) changes over time. Line graphs can also produce a very important piece of evidence that shows a relationship between both the Y and X axis called the slope.

***Line graphs will be presented in part 2***

The data from the previous example above would be most clearly shown using a simple bar graph.



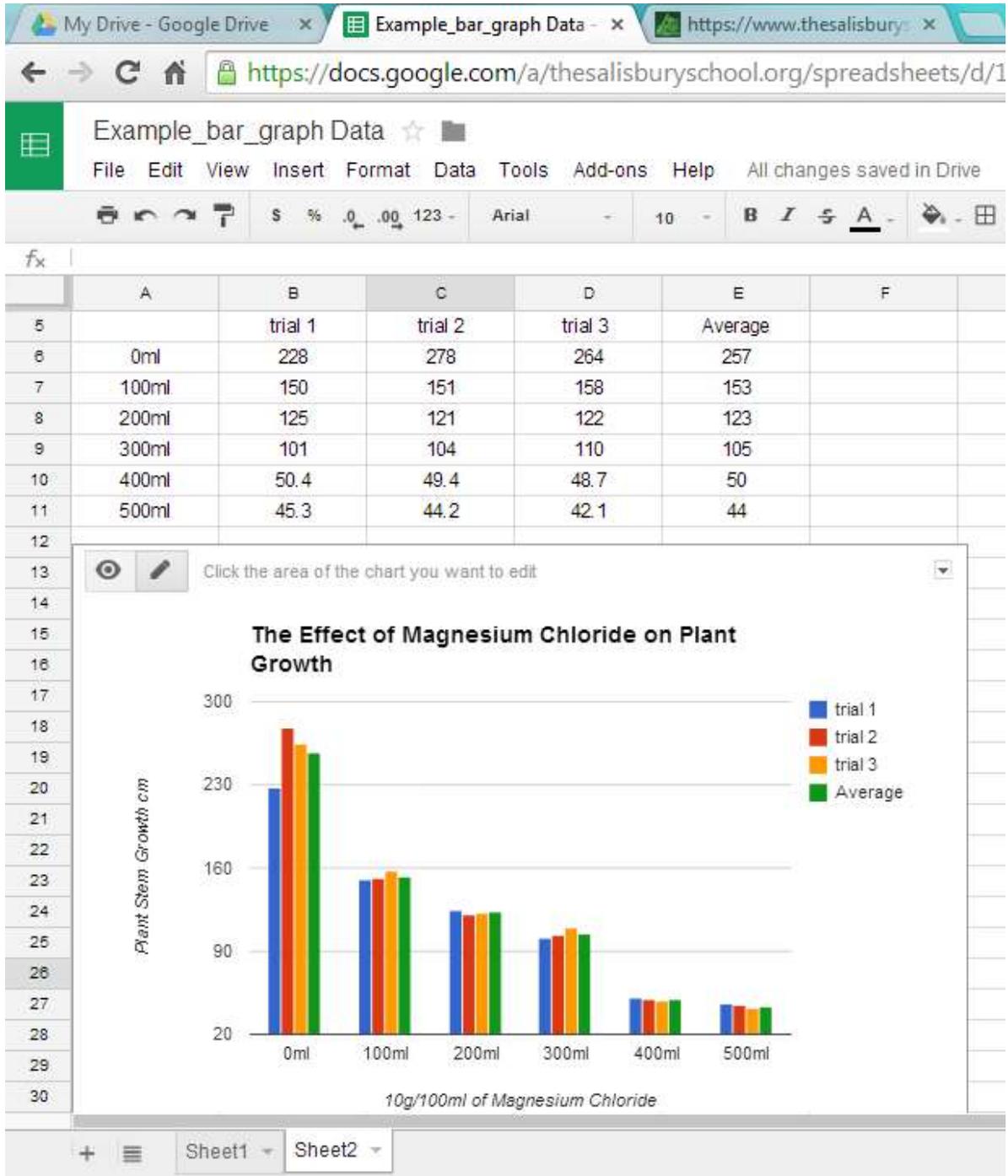
The X-axis would be - **mls of magnesium chloride (10g/100ml)**. Each bar would signify what you changed in between the samples (*the independent variable*)

The Y-axis would be **length of stem in cm** (*the dependent variable*)

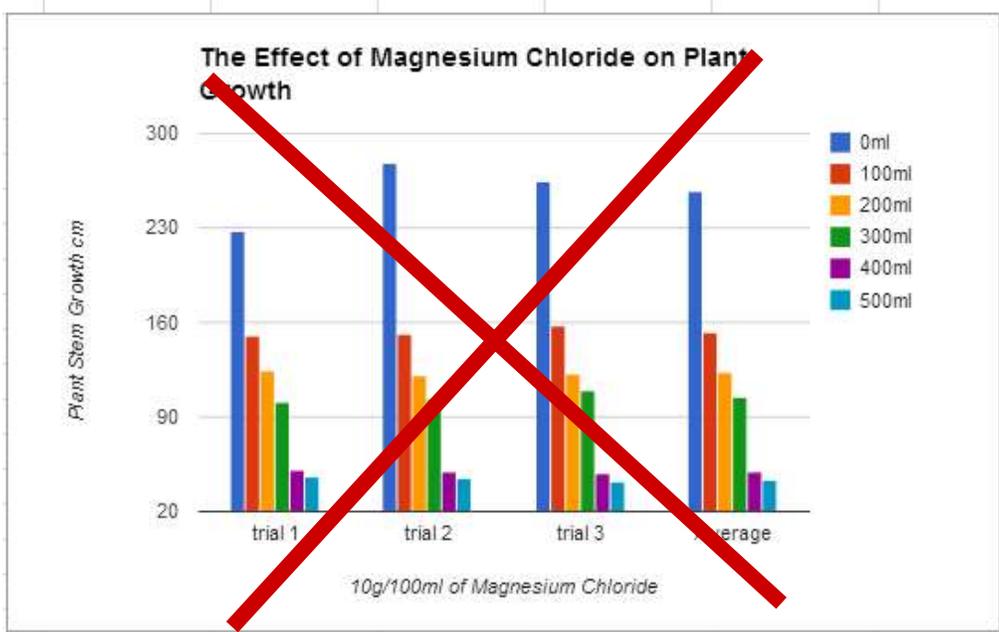
If you did three trials, you would group the bars when making the graph, remember that the observer of the graph would read the data easier if it is grouped according to trials and changes in the independent variable NOT JUST TRIALS.

**Use the =average(b6:d6) function to let google spreadsheet do all of your calculations for you**

**YES to this graph**



**NO to this graph**



**Figure 1: The Effect of Sodium Chloride on Plant Stem Growth**

100ml	200ml	300ml	400ml	500ml	0ml
84.3	94.1	101	60.1	45.7	25.6

**Figure 2: The Effects of Different Salts on Plant Mass Growth.**

Condition	NaCl +H2O	NaCl + mineral	MgCl2 + +H2O	MgCl2 + Mineral	H2O
Trial 1	123	89.0	133	99.0	200.
Trial 2	133	80.3	140	95.3	201
Trial 3	127	78.9	146	76.9	212
Average					