

Lesson Ten

EXCEL AND QUANTIFICATION

Using the samples brought in from home, create a database of all measurements in Excel. Create a graph for each laboratory result.

Excel Worksheet for Data Management

Open new “Worksheet” and type in the following headings in row 1 starting under column A.

- Sample Number: *will be given in lab*
- Name: *last of addressee*
- Name: *first of addressee*
- Address
- Town
- State
- Phone Number: *for laboratory research inquiries only*
- Date Sample Collected: *from house or site*
- Latitude
- Longitude
- Date Sample Analyzed: *date lab procedures were performed on samples*
- Nitrate:
- Chloride:
- PH:
- Conductivity:
- Hardness:
- Iron

Example:

Sample ID	Date	Name Last	Name First	Address	City	State	Latitude	Longitude	Chloride mg/L	Nitrates mg/L	pH	Conductivity uS/cm	Iron mg/L	Hardness mg/L	Source Type	Needs Letter	System
Mc 1	2/28/12	Brach	Jane	2313 Alb	Walden	NY	'34'48.1	4'13'17.87\	64	0	7	395	0	220	drilled		No
Gi 1	3/8/12	Martin	Jennif	130 Deck	Walden	NY			128	0	7.75`	383	0.7	20	drilled	x	softener

I. How-to Graph Parameters

First create an Excel Worksheet according to directions above.

To do a scatter plot:

1. Open your Excel program to the worksheet you created with your parameters.
2. Select *Insert* from the drop down menu (at the top of your page), go down to *Chart* and select,. When the next menu comes up pick the *XY scatter plot* graph type,.
3. Pick the set where the points are NOT connected, then click *Next* (if applicable)
4. Right click on your mouse and select *Series*

5. Now go to add.
6. Insert information for the X axis (independent variable) by selecting the column you wish to use (i.e., Sample ID)
7. Delete the information automatically placed in the Y axis.
8. Insert information for Y axis (manipulated variable) by selecting the column you wish to use (i.e., Chloride)
9. You do not need a title for your series if your graph is only one parameter. Leave that part blank, then click *Next* (if applicable)
10. Give the graph a title that tells what's going to be shown on the graph. Describe it like a picture! (i.e., Sodium Chloride Ranges in the Town Water and Groundwater Wells of Montgomery, NY Spring 2008)
11. Make sure to use the date when you did the testing.
12. Label both the X and Y axis by describing the variable USE UNITS!!
13. Click to see the graph you've made once you have inserted all the information. Save or *Finish* the graph in the separate *Chart* selection and name it the same as the graph title.
14. Look at your graph, you may have an outlier (it's still important information). IF NOT, then change the axis range by right clicking on the numbers of each axis and *Format Axis*.
15. Click on the *Series* box inside your graph and *Delete*. It is not necessary for this type of graph.
16. Repeat this process with each parameter. Make sure you use **Sample ID** as your X axis.

II. How-to Generate Statistics

Start at the Worksheet where you have all the parameters listed in the format according to directions on page 43 of the GET WET! Curriculum booklet.

To do statistics:

1. You will need to make space under each column with labels as shown below:

Sample ID	Date	City	Chloride mg/L	Nitrates mg/L	pH	Conductivity uS/cm	Iron mg/L	Hardness mg/L
Mc 1	2/28/12	Walden	64	0	7.47	395	0	220
Mc 2	2/28/12	Walden	288	0	7.06	621	0.3	380
Mc 3	3/1/12	Montgomer	160	3.5	7.27	537	0	300
Mc 4	2/29/12	Walden	160	2	6.95	537	0	300
Mc 5	2/29/12	Walden	128	3	7	548	0.3	240
Mc 6	2/28/12	Walden	64	1.5	7.15	475	0.1	320
Mc 7	3/1/12	Montgomer	128	4.5	6.97	424	0	280
Mc 8	3/1/12	Walden	64	5	7.33	192	0.15	140
		Range						
		Mean						
		Median						
		Mode						
		Standard Deviation	75.41					

2. To find the statistics, go to the sheet (not the graph) click on a box underneath the *Chloride* column (for example). You need to make sure the standard toolbox is visible.
3. Click the box next to Standard Deviation FIRST. Then click the summation symbol Σ down arrow.
4. Select *More Functions* and hand type in the words Standard Deviation.
5. Select *STDV* because it will ignore logical values and text.
6. Under the *Number* area, select the column (NUMBERS ONLY) that you want the computer to calculate the standard deviation: As the green shaded area above in the example. Select *Return*.
7. Repeat for each column.
8. Follow the same steps but at #4 above choose Mode, Median, and Average (for Mean). Some programs require you hand calculate Mode, all programs require you hand calculate Range.

III. Putting it all together:

1. When copying graphs and charts into either Word or PowerPoint, you should paste it in Paste Special. Go to *Edit* and in the drop down menu select *Paste Special*.
2. Choose *Microsoft Excel Sheet Object* under Paste Special as it will allow you to work on your graph or chart from Word or PowerPoint. If you simply hit "Copy then Paste" the object becomes a picture and you are unable to edit it.