Barnard Library Empirical Reasoning Lab: Excel for Chemistry BC2001

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Getting Started

- Go to the ERL Website for this class: erl.barnard.edu/Chem2001-2014**.**
- Do the first part of the survey (the rest of it is to be done after the class).
- Download the data from the link on the website, and enable editing.

Formulas and Functions

X*Y

- Don't forget to label your data – write **X*Y** at the top of column C, in cell C1.
- Write the formula **=a2*b2** in cell C2. Always start formulas with a = sign.
- The **select** cursor is a large white plus sign and the **copy** cursor is a small black plus sign that only shows up at the bottom right corner of the cell. Copy the formula down the column.
- Excel will use **relative referencing** - i.e. in row 5 it calculates **A5*B5**, but in row 6 it calculates **A6*B6**.

50X

- Write **50X** in cell D1.
- To use **absolute referencing**, put in a **$** sign to tell Excel not to use relative referencing. The letter or number after the **$** refers absolutely to a particular row or column. If you put 50 in cell F1, in D2 you can use the formula **=a2*f$1**.
- If you want to multiply by a different number, just change it in F1, hit enter, and the results are updated.

Average

- Write **Average** in cell A22.
- Write **=average(** in cell A23 and select the X rows to be averaged. It's important to include the **(**.

Other Functions

- You can find functions by going to the **Formulas** tab, and then to **Insert Function**. Make sure you've selected a blank cell with the cursor. If your cursor is still on the Average function, then it will default to a dialogue box showing you how to calculate the average.
- The functions are organized categorically in the function library (just to the right of the **Insert Function** box).

Inserting and Editing a Scatter Plot

- Select the data for the chart and go to **Insert – Scatter**.
- In Excel 2013, the chart has 3 boxes to the right of it. The green plus sign allows you to edit particular elements of the chart. In earlier versions of Excel, use the **Chart Tools - Layout** tab.
- To format the axes, in Excel 2013, click on the green **+**. In earlier versions of Excel, select the X axis by clicking on a number on the axis, then right click and use **Format Axis - Axis Options**.
- Use **Axis Options** to change the numbering on the X axis to go from 0 to 1, instead of 0 to 1.2, and change the major units to 0.1.
- To insert or delete gridlines, in Excel 2013 you can click on gridlines to edit them, or you can click on the green **+**. In earlier versions of Excel, to add vertical gridlines, select the X axis, then right click and use **Format Axis - Add Major Gridlines**. Right clicking on the vertical axis allows you to add horizontal gridlines.
- To format the data series (meaning the series of dots, or markers, on the chart – not to be confused with data labels, the labels showing the values of the data), right click on a data marker and select **Format Data Series**. In Excel 2013, click on the paint box in the right hand box and select **Marker**. Change the color of the markers to green.

Inserting a Linear Trendline

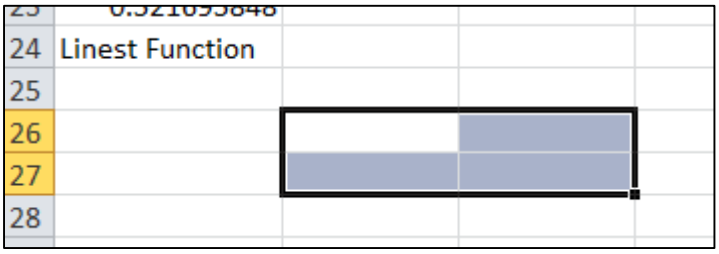
- To add a trendline to the chart, in Excel 2013, click on the green **+**. In earlier versions of Excel, right click on a marker and then click on **Add Trendline**. To change its formatting, e.g. make it solid, right click on it and select **Format Trendline**. (In earlier versions of Excel, it's solid by default.)
- To display the equation for the trendline and the R-squared value for the data, right click on the trendline, select **Format Trendline**, and click on the graph icon in the format box. At the bottom of the box are three checkboxes - the bottom two should be checked. Move the equation and the R-squared value around on the chart so they can be read easily.

Adding Partial Data to the Scatter Plot

- To add another set of data to the chart, go to the second worksheet in the workbook, titled "Z". Copy the column from the worksheet and paste it into column G on the first worksheet. We'll add part of this data to the scatter plot to compare Y and Z with respect to X.
- In Excel 2013, click on the chart and select the third box (that looks like a funnel). At the bottom right, click on **Select Data**. In earlier versions of Excel, you right click anywhere on the chart and then click on **Select Data**.
- The data series already on the chart is currently called "Series1." To rename it as "Y", click on **Edit** and write in **Y** under **Series name**. Click on OK.
- To add a new data series, click on **Add**, and under **Series name** select cell G1, or alternatively write in **Z**. Move the cursor to the box **Series X values**. Select elements in X from **A5 - A12** (we are adding a partial dataset). Move the cursor to the box **Series Y values** and delete the **={1}** that appears there. Select elements in Z from **G5 - G12**. Click on OK twice.
- To insert a legend or edit the chart title, in Excel 2013, click on the green **+**, and in earlier versions of Excel, go to **Chart Tools – Layout**.

The Linest Function

- This function is used to calculate the parameters of the trendline and the standard errors for the parameters.
- Linest is an array function, and the results are displayed in a 2x2 array. (For the full output from the Linest function, you would select ten cells in a 2x5 matrix formation, but for this class you will only need the top two lines of the Linest array.)
- In cell A24, type **Linest Function**, and select the four empty cells B26, C26, B27 and C27. See below:



- In B26, type **=linest(**
- Follow the prompts in Excel: select **known Ys** (which is the Y variable in column B), type a **comma**, then select the next argument which is **known Xs** (which is the X variable in column A), type a **comma**, then for [const] type **true**, and for [stats] also type **true**.
- Press **CTRL + SHIFT + ENTER** all simultaneously, and the Linest function will fill out the 2x2 array.

Pasting a Chart into a Word Document

- Right click on the frame of the chart and click on **Copy**. In Word you can paste it in as a picture by selecting **Paste Options – Picture**.
- There are other alternatives under **Paste Options** that will allow you to edit the chart in Word after pasting it.