Plotting with Excel 2016 (Mac) – Physics Lab

1. Type your data in an Excel worksheet in columns. You can save time by performing calculations directly on the worksheet: Type in formula in the first cell. Highlight column/row to fill. Within the "Edit" dropdown menu, click on "Fill" and then click on "Down", "Right", or other options.

2. Select the data to plot by highlighting it. Keep in mind that Excel will plot the first column of data as your horizontal (x) axis. You can type the data that you want displayed on your x-axis as your first column or, alternatively, manipulate Chart Wizard later (step 4).

3. Highlight the columns you would like to plot. Click on the "Insert" then choose the "XY (Scatter)" Chart (the name will appear when you float your cursor on the icons). Then click on "Marked Scatter" (the first left panel that has no lines joining the data points).

4. If necessary, you can at this point manipulate the values in the x- and y-axis. Right-click on any data point in the chart and go to "Select Data…". Activate and highlight the "X values" field by clicking in it. Fill the field with the column of your choice. You can either type in the column range manually (for example, typing: =Sheet1!$B$3:$B$9 will take the data in column B from cell 3 through 9), or simply highlight the column of interest with your mouse. Repeat for the "Y values" field. Click on "OK" when you are done.

5. You now have a plot but might need to zoom in by adjusting the default minimum and maximum values on the x- and y-axis to what you choose them to be. Right-click on your horizontal axis and select "Format Axis…" (last row). A panel will open on the right side of your worksheet that will allow you to adjust starting and ending points of your axis ("Axis Options" tab => "Bounds"), the spacing between tick marks, labels, and more. Choose a scale that is meaningful (avoid graphs that have a lot of empty space in them, for example). Do the same for your vertical axis.

6. Make sure the chart is highlighted (clicked on). Now from the Chart Design tab (remember you need to have clicked on the chart to see it), click on the "Add Chart Element" icon that is all the way in the top left corner of the spread sheet. Select "Axis Title", "Primary Horizontal". Click on the label that now appears below the horizontal axis ("Axis Title") and change it to an appropriate label. Remember to include the unit the variable is measured in (e.g. Period (s)).

7. Repeat this step for your vertical axis ("Primary Vertical)." Make sure to include the units you are using for each axis!

8. In the same way, give your graph a relevant title. Remember that, by convention, the Y-axis appears in the name before the X-axis does, e.g., Length (on your Y-axis) vs. Period (on your X-axis). You are almost done…

9. Now right-click on any of the data points and choose "Add Trendline…" Select "Type" from the options on the left-hand column. Select the type of trendline that will describe your data. The data that you will need to plot during your physics lab exercises will either follow a linear or quadratic form. For the former type, select the "Linear" type option. For the latter, click on the "Polynomial" option and set the Order of the polynomial to "2". Go to the bottom and check the next to last box: "Display Equation on chart". You can click on any of the boxes you created on your graph (title box, axis labels, equation of trendline), and move them around your chart by dragging and dropping.

   You are all set. Happy plotting!