Creating Excellent Graphs for Science using MS Excel

For those of us who want to use MS Excel to create graphs of our data, here are two YouTube videos that do a very good job of explaining the steps required. Notice that there are a lot of steps required to create excellent graphs. Just as anything else in life, if a task is worth doing, then it is also worth doing correctly.

The first video explains how to select the data that will be used for the graph. The author shows how to pick two data sets from a complex table. Everything described in this video is top-notch and worth trying. The following is a list of things that you should definitely watch for:

- choosing XY scatter plot
- plotting only the points, not a line!
- swapping axis (if required ⇒ we <u>always</u> want our independent variable on the horizontal axis!)
- deleting the legend (@ t=4:08 in the video)
- Adding axis labels and a chart title (@ t=4:18 in the video)
- changing the background colour (@ t=5:08 in the video)
- adding major gridlines (@ t=5:30 in the video)
- changing the colour of gridlines (@ t=5:53 in the video)
- differentiating major and minor gridlines with colour (@ t=6:20 in the video)
- adjusting the scale of the units on the axis

Find the video here: **http://www.youtube.com/watch?v=-3WgNXh4K8Y**

The second video describes how to add a line that is **fitted** to the scattered data points. Excel calls this a *trendline*. Trendlines are a powerful tool but must be used correctly. The video author suggests that straight lines (linear) are usually the best to use in physics studies. Note that he says usually – our d(t) graphs are curved second degree polynomials (parabolas) for uniform accelerated motion. Watch out for these topics:

- adding the trendline
- displaying the equation of your trendline (@ t=2:30 in the video)
  ⇒ the term *gradient* used in the video means the same a *slope*
- setting the intercept on the graph (@ t=3:10 in the video)
  ⇒ this is good for when you know **for certain** that the graph should start at (0,0) such as our d(t) data where we interpret $\Delta d=0$ at $\Delta t=0$. Note that the author later turns it off.
- **forcasting** the trendline (@ t=3:50 in the video)
  ⇒ we will <u>always</u> want to forcast our data so that the trendline touches the vertical axis!

If you watch and learn the techniques up to time = 4:50 in the video, you will be well set for graphing in grade 11. Those students who take Math of Data Management in grade 12 will be learning about types of graphs and fitting lines through data in more detail. In particular, you will learn about *outliers*. The video author describes how to deal with outliers (which he calls *anomalous points*) in the rest of this video. You can use these techniques in grade 11 & 12 physics but you must be careful in identifying the outliers correctly.

Find the video here: **http://www.youtube.com/watch?v=veftqlSualQ**