Linear Graphs

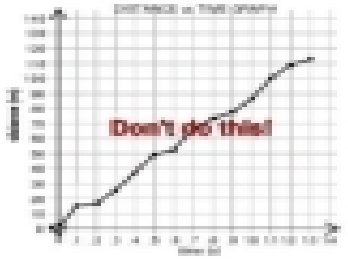
Graphs are a valuable tool for conveying and interpreting data. It can be much easier to see the trend in a data set from a visual graph than from a table of numbers. When conducting experiments, scientists can more easily draw conclusions from a graph when it is a straight line than when it is a curve. Data is often recalculated so as to make a graph that was a curve look like a straight line. [1] For these reasons, it is important to know how to work with straight line graphs.

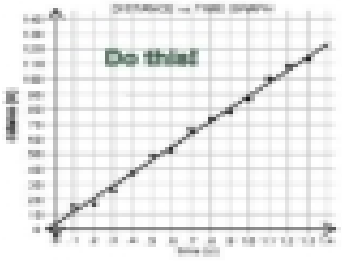
THE LINE OF BEST FIT

Even if your data are meant to form a straight line, they almost certainly won't. If your data points all lie perfectly on a straight line, your teacher is more likely to be suspicious than pleased. When you do a lab, your job in creating a graph is to interpret the data to find the **line of best fit**, a line that represents your data and tries to remove any inconsistencies that crop up because of normal variation in data.

Don't join your data points dot-to-dot. Instead, draw one straight line that goes through as many data points as you can, with about half above it and about half below it. The line doesn't even have to pass through any points. It only has to "average them out".

Once you have your line of best fit, all future calculations about the experiment as a whole are done with that line, not your data points, since using one or two data points (even if they're actually on the line) gives them more importance than the others, and this introduces bias into the experiment.





Other pitfalls in graphing

Don't just join the first data point to the last. If either point is off from where your line should be, the line you draw will look strange, and not be representative of your data.

[1] There's more on this topic in the Phys 083 handout "Plotting the Right Variables to Obtain Straight Line Graphs", also available in the VCC Learning Centre.

Authored by Darren Rigby