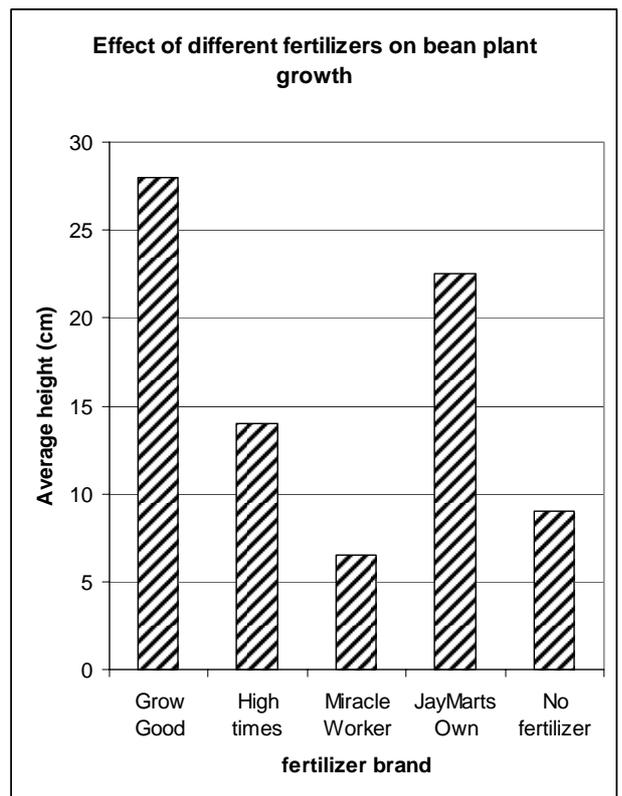


Graphing skills

A bar graph: The items being compared do not affect each other. A typical chart or table for this graph might look like this. See how easy it is to see what was done in the experiment below with bean plant growth and different brands of fertilizer. A bar graph is best for showing how one variable (plant height) is affected by another characteristic (which fertilizer brand is used).

Fertilizer brand	Average height (cm)
Grow Good	28.0
High times	14.0
Miracle Worker	6.5
JayMarts Own	22.5
No fertilizer	9.0

The bars do NOT touch each other.
The numbers on the Y-axis start at 0 and go up evenly.



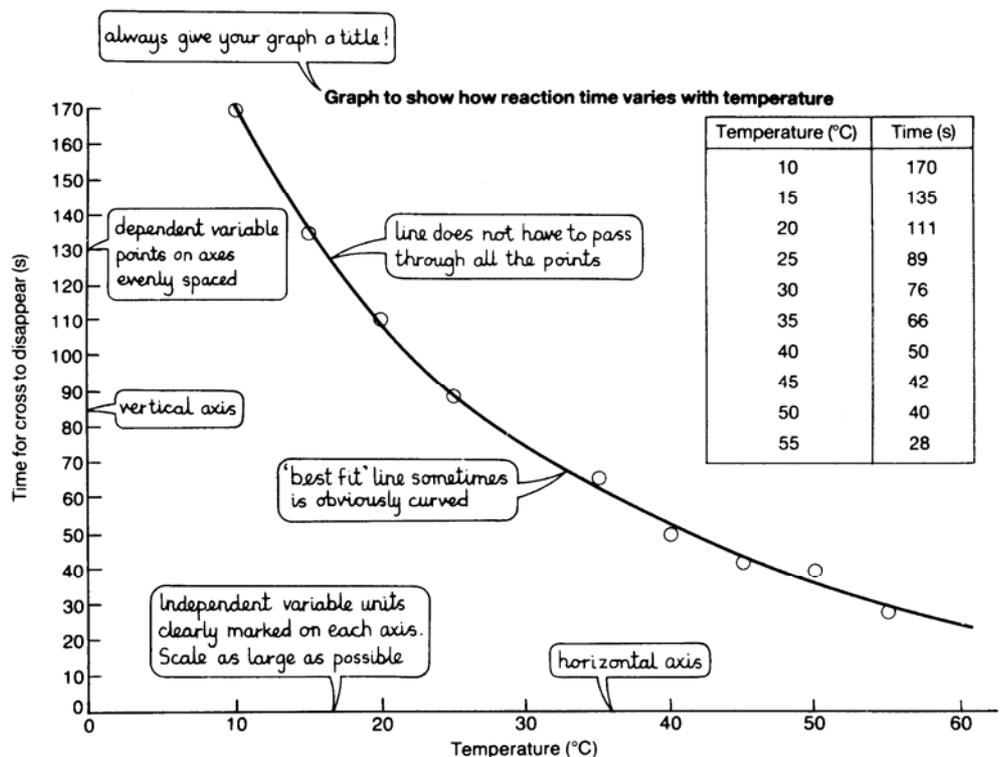
A line graph: A line graph is best for showing how one variable affects another variable. Generally, with a line graph, both variables are measurable traits and so both have a number associated with them.

The two sets of measurements here are temperature and time. The time taken for a chemical reaction depends on the temperature. Therefore, time is called the dependent variable.

Temperature is called the independent variable because the person doing the investigation chooses the temperatures for each experiment.

The dependent variable always goes on the vertical axis.

The independent variable always goes on the horizontal axis.



Some other points to note

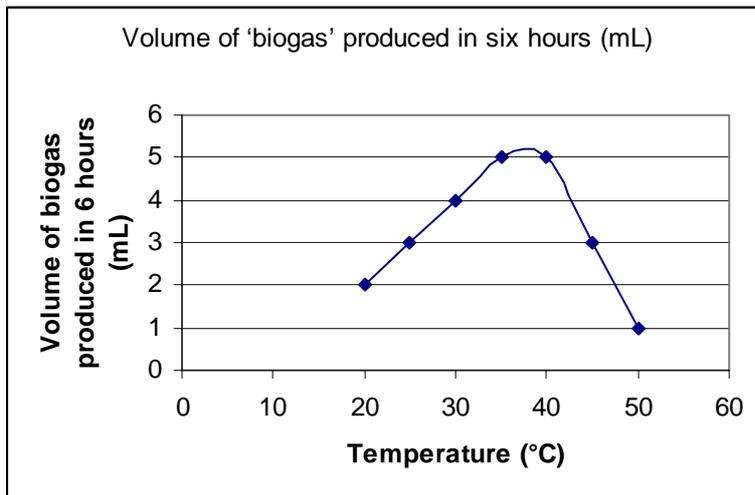
Titles and labels - Always give your graph a title. Always label each axis and write the units in brackets.

Size - Should be as large as possible—use as much of the graph paper as you can.

Scale - Work out the total range of values for each variable. Make sure that the numbers are evenly spaced on each axis.

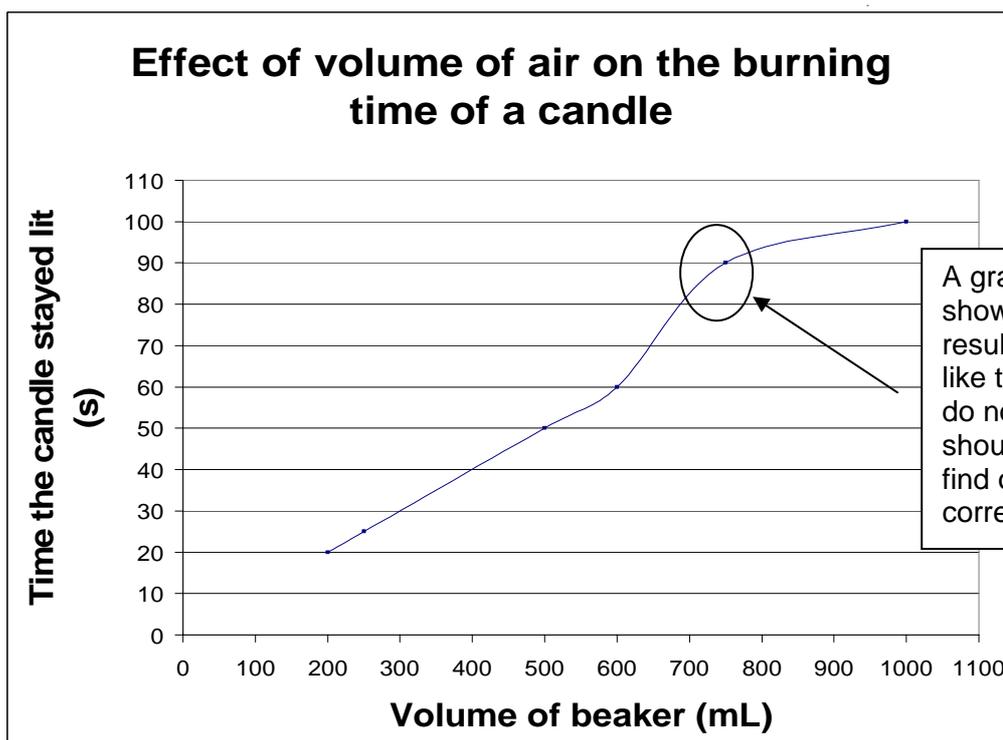
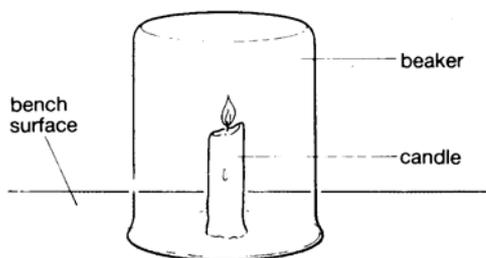
Points on a line graph - These should be clearly marked with an ×. If you have two sets of information, the points should be drawn differently.

Line - The line that you draw after plotting the points should always show up the general pattern that the results take. Always take a good look at the points and try to see the overall shape that they make. Very often this will be a straight line or gentle curve. Do not worry if you cannot draw a single line through all the points. Draw a 'best fit' line which goes as close as possible to most of the points. Try and draw the line so that the points are evenly scattered on either side. If a straight line seems to fit the points best then use a clear plastic ruler to find the best position for the line. If a curve seems best then make it as smooth as possible and avoid using sharp angles unless there is obviously a very sudden change in direction. Do NOT just "join the dots" with your ruler to make a zigzag line.



Using your graph

A graph can show a steady increase or decrease in the measurements. This kind of pattern is called a trend. It can show similarities and differences between two sets of measurements. A graph can be used to find values that you have not actually measured. This might be between two actual measurements or might be a continuation of the graph beyond your measurements.



A graph can be used to show unexpected results. Measurements like these that obviously do not fit the pattern should be repeated to find out if they are correct.