

Graphing Experimental Data

Looking at how two sets of numbers are related to each other.

Data Table

Assume that you have measured some temperature values over a period of time. The data should be arranged in a table like the one shown below. Note that it has a title, the variables are identified, and the units are shown.

Temperature Changes Over Time of 100 g of an Unknown Metal in 2 L of 50 °C Water

Temperature (°C)	Time(s)
22.0	0.0
24.7	5.0
26.9	10.0
28.4	15.0
29.5	20.0

Laying Out the Graph:

Determine which quantity depends on the other. In this example, the temperature was measured at specific times, so the temperature *depends* on the time at which it is read. The dependent variable goes on the Y axis (up and down) and the other variable (independent variable) goes on the X axis (left and right). Draw two lines with a straight edge using at least half of one piece of graph paper (see below). Draw arrowheads at the end of each line and label the lines with the title and unit in parenthesis.

Labeling the Axis:

Select a scale that allows the data to fill out most of the area of the graph. The scale should start at zero and rise in equal steps until the highest value for that category. In the graph shown, the time scale works best if each grid line represents one second. For the temperature scale, there is not enough room for one grid for each degree of temperature, so two degrees per grid line would be better.

Adding a Title:

Use the same title as on the data table. It should include the dependent and independent variables and any important controlled variables.

Plotting Points:

After labeling the axis the data points can be plotted by placing each dot at the intersection of a vertical time line with a horizontal temperature line. If a data point does not land on a grid line, you should estimate how far it is between two adjacent grid lines and place a dot there (see figure).

Drawing the Curve:

Using a pencil draw a faint curve that connects the dots. Don't force the line to be straight, but let the curve fit the points as smoothly as possible. Once you are satisfied with the curve, darken it with either a pencil or pen.

