



Presenting data

Data is the information you collect from experiments. It often consists of numbers such as measurements. Organizing data into tables, charts, or graphs helps you make sense of it and spot patterns. The kind of chart or graph you use depends on the kind of data you collect.

Tables

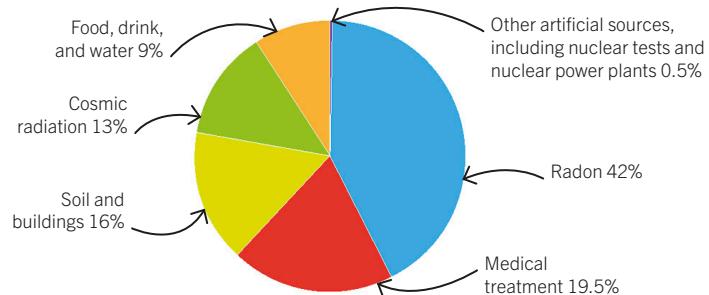
Tables are useful for organizing data and for doing simple calculations, such as working out mean (average) values. This table shows results from an experiment investigating how mass added to a cart affects its acceleration.

| Mass added to cart (kg) | Acceleration (m/s^2) | | | |
|-------------------------|---------------------------------|---------------------|---------------------|------|
| | 1 st run | 2 nd run | 3 rd run | Mean |
| 0.5 | 9.9 | 10.2 | 10.1 | 10.1 |
| 1.0 | 6.8 | 8.8 | 6.6 | 6.7 |
| 1.5 | 5.2 | 4.8 | 5.1 | 5.0 |

Tables help us spot "outliers." These are very different from the other values and may be mistakes. This value was ignored when calculating the mean.

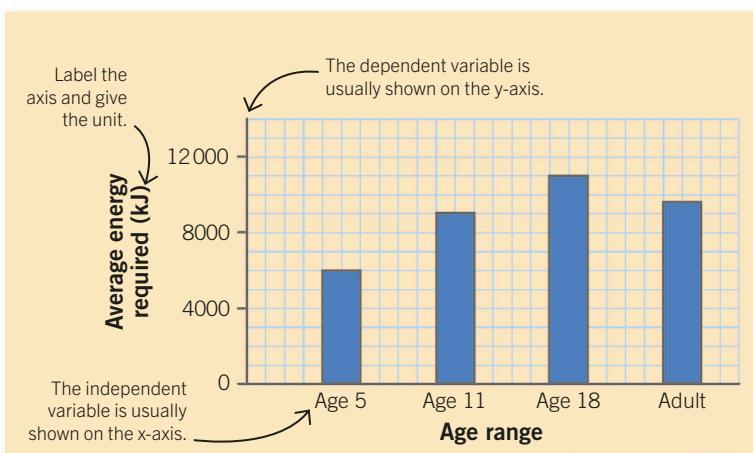
Pie charts

Use a pie chart to show percentages or relative amounts. For example, this pie chart shows estimates of different sources of background radiation that people are exposed to worldwide.



Bar charts

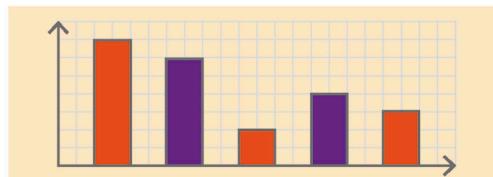
Use a bar chart when the independent variable is made up of discrete (separate) categories. For example, this bar chart shows how much energy different groups of people need each day. You should also use a bar chart when the independent variable consists of discrete values, such as numbers of people or numbers of objects (which are always counted in whole numbers).





Continuous and discrete variables

Discrete variables are variables that can only have certain values. For example, the number of passengers on a plane can only be a whole number, and the insulation around a container of hot water can only consist of certain materials. A continuous variable, however, can take any value and may not be a whole number. Length and weight, for example, are continuous variables.



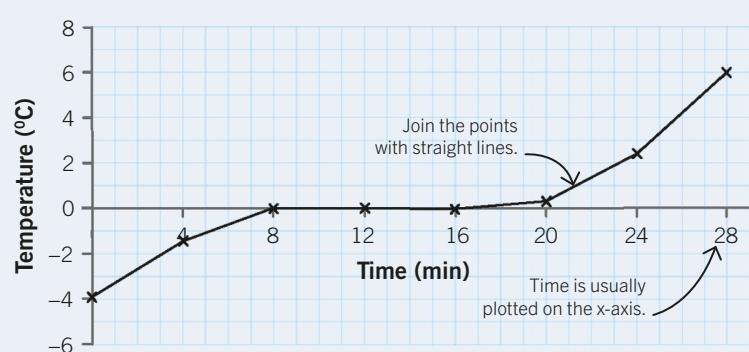
Discrete variable



Continuous variable

Line graphs

Use a line graph when both axes show numerical values that vary continuously rather than dividing into discrete (separate) categories. Line graphs are often used when one of your variables is time. This graph shows how the temperature of ice changes as it is heated.



Scatter graphs

Use a scatter graph to investigate a relationship between two variables. This graph shows how the current through a resistor and through a bulb varies when the voltage is changed. If the data points form a clear pattern when plotted on the graph, such as a line, we say the variables are correlated. When this is the case, draw a straight "line of best fit" or "curve of best fit" through the points.

