

CIE Biology GCSE

General practical skills

Analysing results and assessing validity

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Data analysis

There are multiple different ways of processing data. You may make **calculations**, such as finding an average or a percentage. Ensure you always show your working out for calculations. You also may plot your data on a **graph**, which could be a line, bar, scatter, or another type of graph. With graphs it is important to choose an appropriate **scale** so that the data can be clearly interpreted. Also, make sure to **label** your graph axes and include any **units**.

Validity

Validity is the extent to which your results are able to answer the question you originally asked. Before analysing results, reread the introduction to the experiment to remind yourself of its **aims**, as well as any **theories** underlying the research area. This will help you think about whether your results answer your question.

Some things that may **reduce** the validity of your experiment include;

- **Resolution** of equipment; if your equipment is not very precise, you may not have errors in your measurements.
- Size of **increments**; with equipment such as pipettes, only a fixed increment size is available, limiting the accuracy of your measurements. It is also important to consider the 'error margins' for readings using a specific piece of scientific equipment.
- **Confounding** variables; these are any variables other than your independent variable(s) that affect your dependent variable. It is important to try and control for these confounding variables, however this is not always possible e.g. temperature of the room.
- Error types; **random** errors do not have any identifiable cause and therefore cannot be corrected. Instead you must make new measurements. **Systematic** errors result in measured values that differ by the same amount every time. The cause can be identified and thereby the error eliminated. **Experimenter** errors occur through human error e.g. the researcher might misread a measurement, or write something down incorrectly.

Also consider how **reliable** your results are; in other words, if you could repeat the experiment using the same method and equipment, and obtain the same result. It is good practice to repeat an experiment at least twice with the aim of obtaining **concordant** results, which will also help discount any **anomalies**.

