

Experimental Design Glossary of Terms

Term	Definition	Notes
	a measurement result is considered accurate if it is judged to be close to the true value	for example the value of resistance found by a practical compared to calculated value
	value in a set of results that is judged not to be part of the inherent variation	a result which does not agree with other values in a results table or on a graph
	variables other than the independent and dependent variables which are kept the same	quantities or conditions that you keep the same in a practical
	variable which is measured whenever there is a change in the independent variable	the quantities or conditions that you are investigating in a practical
	variable which is deliberately changed by the person in the planning of a practical activity	the quantities or conditions that you change to see how it affects the dependent variable in a practical
	a line drawn on a graph that passes as close as possible to the data points. It represents the best estimate of the underlying relationship between the variables.	in GCSE sciences a line of best fit can be a straight line or a curve. Please note that in GCSE Maths a line of best fit is always a straight line.
	a quality denoting the closeness of agreement between measured values obtained by repeated measurements	for example in a chemistry titration practical these would be precise results: 1.30; 1.20; 1.25cm ³
	error in a measurement due to small uncontrollable effects	it is important not to confuse error with uncertainty or making a mistake.
	the maximum and minimum values of the independent or dependent variables	for example choosing to use pH values from pH2 to pH12 as the independent variable in a practical. Please note that in Maths the range is the difference between the biggest and smallest value of a variable.

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	precision obtained when measurement results are produced in one laboratory, by a single operator, using the same conditions, over a short timescale	you have good repeatability if you get the same results every time you do the same practical
	precision obtained when measurement results are produced by different laboratories and therefore by different operators using different pieces of equipment	you have good reproducibility if you get the same results as a student in another school or a student in your school who uses different equipment
	smallest change in the input quantity being measured by a measuring instrument that gives a perceptible change in the reading of the measuring instrument	for example the resolution of a ruler is 1 mm and the resolution of a burette is 0.1 cm ³
	a subset of the whole population of data. Samples can be composed of repeated readings.	a sample is representative when the data measured gives the same answer as if you measured the whole population of data e.g. sample could be the height of students in a class to find the mean height of all students of that year group.
	error due to the measured value differing from the true value by the same amount each time.	for example a zero error when the measuring device indicates a value when the quantity being measured is zero.
	interval within which the true value can be expected to lie, with a given level of confidence or probability	the likelihood of a measurement falling close to the true value. A big range in the measurements of the dependent variable implies a high level of uncertainty. Use of range bars will help to show level of uncertainty.
	suitability of the method used to answer the question being asked	does the data you will collect using the method answer the question you are asking?
	a conclusion supported by valid data, obtained from an appropriate experimental design and based on sound reasoning	you will need to have both a valid method and have collected valid data before you can reach a valid conclusion.