

## **WJEC GCSE SCIENCE - GLOSSARY OF TERMS**

The definitions used in the glossary have been adapted from  
*The Language of Measurement: Terminology used in school science investigations.*  
Association for Science Education (ASE), 2010. ISBN 978 0 86357 424 5.  
This was produced by the Association for Science Education and the Nuffield Foundation.

<b>Term</b>	<b>Definition</b>
<b>Independent variable</b>	The variable for which the values are selected by the investigator.
<b>Dependent variable</b>	The variable for which the values change when the independent variable is changed.
<b>Controlled variable</b>	A variable which may affect the outcome of the investigation and therefore should be kept constant.
<b>Range</b>	The maximum and minimum values of the independent or dependent variables. This should not be too big or too small.
<b>Valid conclusion</b>	A conclusion supported by valid data, obtained from an appropriate experimental design and based on sound reasoning.
<b>Validity of experimental design</b>	Suitability of the investigative procedure to answer the question being asked. Strategies to ensure validity include fair tests and controls that aim to isolate the effect of the independent variable on the dependent variables.
<b>Resolution</b>	This is the smallest change in the quantity being measured by a measuring instrument that can be observed. For example $\pm 1\text{mm}$ on a 1 metre ruler.
<b>Anomaly</b>	Value in a set of results which is judged not to be part of the inherent variation.
<b>True value</b>	This is the value that would be obtained in an ideal measurement.
<b>Uncertainty</b>	The interval within which the true value can be expected to lie, eg "the temperature is $20\text{ }^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ".
<b>Measurement error</b>	The difference between a measured value and the true value.
<b>Systematic error</b>	These cause readings to differ from the true value by a consistent amount each time a measurement is made. Systematic errors can include the influence of the environment, the methods of observation or the instruments used. The effect of systematic errors cannot be reduced by increased repeats.
<b>Random error</b>	These occur due to results varying in an unpredictable way from one measurement to the next. The effect of random errors can be reduced by taking more measurements and calculating a mean.
<b>Accuracy</b>	A measurement result is considered accurate if it is judged to be close to the true value.
<b>Precision</b>	This shows the closeness of agreement between measured values. It gives no indication of how close results are to the true value.
<b>Repeatability</b>	The precision obtained when repeat readings are obtained by a single learner/group.

<b>Repeatable</b>	A measurement is repeatable, if repetition by a single learner/group using same method and equipment, obtains the same or similar results.
<b>Reproducibility</b>	The precision obtained when repeat readings are obtained by a different learners/groups.
<b>Reproducible</b>	A measurement is reproducible, if repetition by different learners/groups obtains the same or similar results. This could include using different equipment/ methods. This is a harder test of the quality of data
<b>Hazard</b>	A chemical or piece of apparatus that could cause harm. It is expected that in risk assessments the nature of the hazard is also specified.
<b>Risk</b>	An action involving a hazard that might result in danger.
<b>Control measures</b>	Something that can be done to reduce or prevent a risk while allowing you to carry out the experiment.