OCR (A) Physics A-level

Modules 1 and 2 - Practical Skills & Foundations of Physics
Definitions and Concepts

Definitions and Concepts for OCR (A) Physics A-level

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Absolute Uncertainties: The interval that a value is said to lie within, with a given level of confidence.

Accuracy: A measure of how close a measurement is to the true value.

Analogue Apparatus: Measuring apparatus such as rulers, beakers and thermometers that rely on the experimenter reading off a scale to determine the measurement.

Anomalies: Data points that don't fit the pattern of the data. You should determine why an anomalous result has occurred before removing it. Repeat readings help remove anomalies.

Control Variables: Variables that must remain the same throughout an experiment so as to not affect the results.

Dependent Variables: The variable being measured in an experiment. It is dependent on the independent variable. The dependent variable should be plotted on the y-axis of a graph.

Digital Apparatus: Measuring apparatus such as ammeters, voltmeters and digital calipers that digitally measure and display a measurement.

Fiducial Marker: A thin marker, such as a splint, that is used to ensure readings are taken from the same place each time. They are used to improve the accuracy of measurements.

Gradient: The change in the y-axis value over the change in the x-axis value between two points. If the graph is curved, a tangent can be drawn to calculate the gradient at a specific point.

Independent Variables: The variable that is changed by the experimenter in an experiment. The independent variable should be plotted on the x-axis of a graph.

Line of Best Fit: A line drawn on a graph to demonstrate the pattern in the plotted data points.

Percentage Uncertainties: The uncertainty of a measurement, expressed as a percentage of the recorded value.

Precision: A measure of how close a measurement is to the mean value. It only gives an indication of the magnitude of random errors, not how close data is to the true value.

Prefixes: Added to the front of units to represent a power of ten change.

Random Errors: Unpredictable variation between measurements that leads to a spread of values about the true value. Random error can be reduced by taking repeat measurements.

Repeatable: The same experimenter can repeat a measurement using the same method and equipment and obtain the same value.

Reproducible: An experiment can be repeated by a different experimenter using a different method and different apparatus, and still obtain the same results.

Resolution: The smallest change in a quantity that causes a visible change in the reading that a measuring instrument records.

Resolution of Forces: The splitting of a force into its horizontal and vertical components.

Scalar Quantities: A quantity that only has a magnitude, without an associated direction. Examples include speed, distance and temperature.

SI Units: The standard units used in equations. They are: metres, kilograms, seconds, amps, Kelvin and moles.

Significant Figures: A measure of a measurement's resolution. All numbers except zero are counted as a significant figure. When zeros are found immediately after a decimal place, they too are counted.

Systematic Errors: Causes all readings to differ from the true value by a fixed amount. Systematic error cannot be corrected by repeat readings, instead a different technique or apparatus should be used.

Triangle of Forces: A method of finding the resultant force of two forces. The two forces are joined tip to tail and the result is then the vector that completes the triangle.

Vector Quantities: A quantity that has both a magnitude and an associated direction. Examples include velocity, displacement and acceleration.

Vernier Scales: The type of scale used on calipers and micrometers, that involve reading from a fixed scale and a moving scale to produce accurate measurements.

Zero Errors: A form of systematic error, caused when a measuring instrument doesn't read zero at a value of zero. This results in all measurements being offset by a fixed amount.