

WJEC (Wales) Physics A-level

SP1.1a - Determination of the Density of Solids

Practical Flashcards

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Define density.



Define density.

Density is the mass per unit volume of a substance or object.



How is density calculated?



How is density calculated?

Density = Mass/Volume

$$\rho = m/V$$



What is the unit of density?



What is the unit of density?

kgm^{-3}



How can the mass of a solid object be determined?



How can the mass of a solid object be determined?

A mass balance can be used. The balance should be zeroed before the object is placed onto it. This ensures that a zero error doesn't occur.



How can the volume of a rectangle be measured?



How can the volume of a rectangle be measured?

The length, width and height of the rectangle can be measured using a ruler. These values can be multiplied together to give the rectangle's volume.



How is uncertainty propagated when measurements are multiplied together?



How is uncertainty propagated when measurements are multiplied together?

When multiplying values, you add the percentage uncertainties to obtain the overall percentage uncertainty of the product. This can then be converted back into an absolute uncertainty if required.



How can the volume of a sphere be ascertained?



How can the volume of a sphere be ascertained?

The diameter of the sphere can be measured using a device such as a vernier calliper or screw gauge micrometer. This can then be halved to give the radius, which can be substituted into:

$V = \frac{4}{3} \pi r^3$ to ascertain the sphere's volume.



How is the uncertainty of a variable calculated if that variable is equal to the power of a measurement taken?



How is the uncertainty of a variable calculated if that variable is equal to the power of a measurement taken?

The percentage uncertainty of the measurement should be multiplied by the power to obtain the percentage uncertainty of the variable.



How can the volume of an irregularly shaped object be determined?



How can the volume of an irregularly shaped object be determined?

The object can be placed into a displacement can. The volume of the object will equal the volume of water that is displaced when it is submerged.



What is the resolution of a 30cm ruler?



What is the resolution of a 30cm ruler?

$\pm 0.1\text{cm}$



What is the resolution of a Vernier Caliper?



What is the resolution of a Vernier Caliper?

$\pm 0.01 \text{ cm}$



What is the resolution of a micrometer?



What is the resolution of a micrometer?

$\pm 0.001\text{mm}$



What is interpolation?



What is interpolation?

Interpolation is the process of estimating a measurement that is between two increments on a measuring scale.

