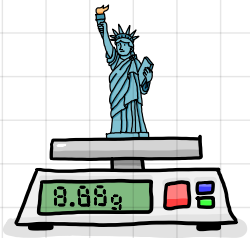
Required practical: Calculating density

Density requires the measurement of the volume of an object and the mass of an object

Measurement of mass

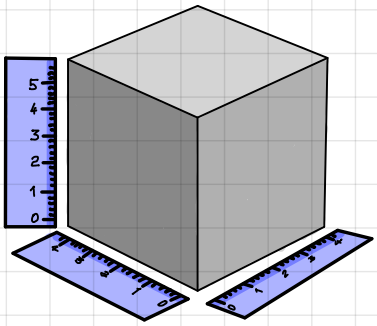


The mass of a solid object is measured using a balance.

The mass of a liquid is measured by measuring the mass of an empty container and then measuring the mass of the container + liquid.
mass of water = (mass of container + liquid) - mass of container.

Measurement of volume of regular object

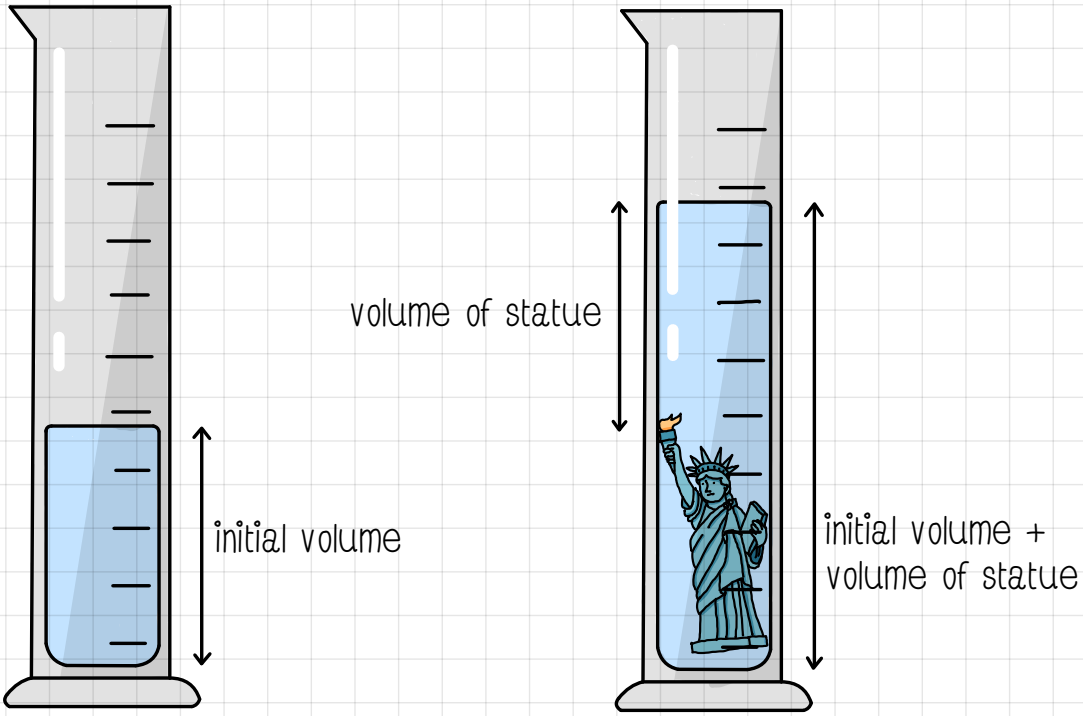
The volume of a regular object can be calculated by measuring three sides and multiplying them together.



volume = 4 x 4 x 5

volume = $80cm^3$

Measurement of irregular volume (measuring cylinder)



volume of statue = (initial volume + volume of statue) - initial volume

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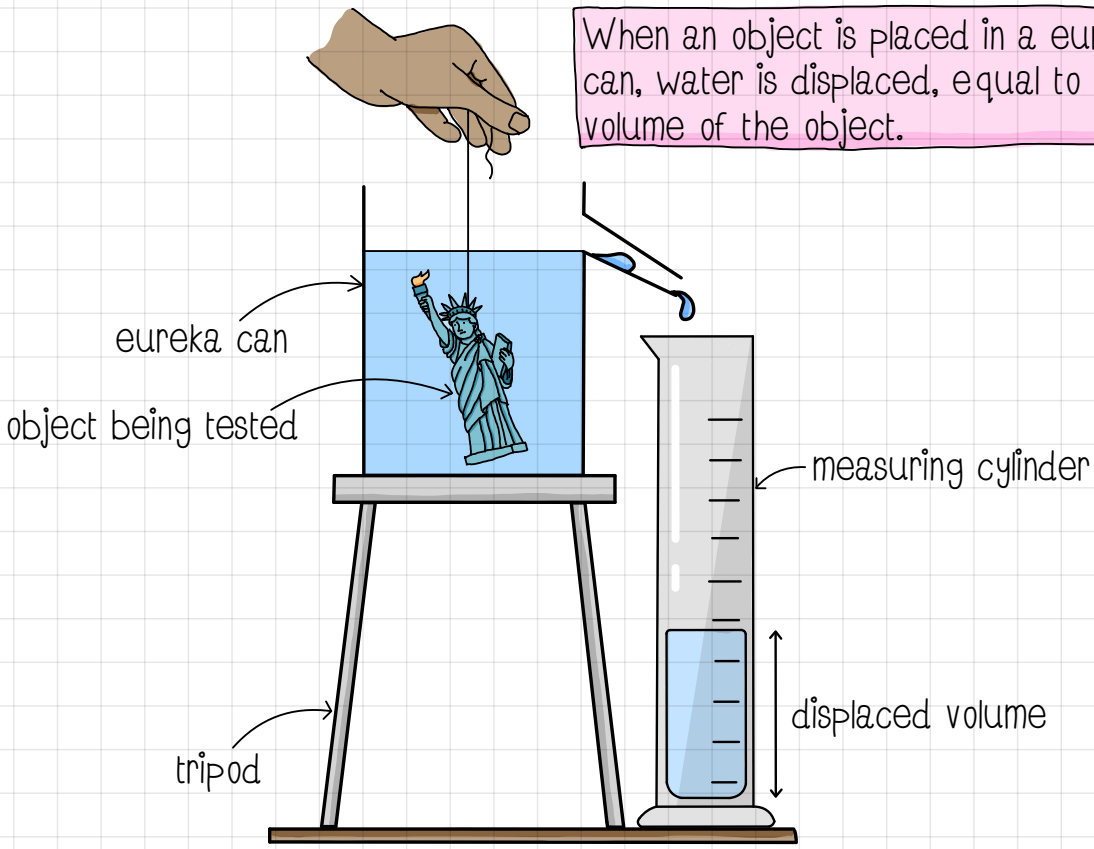
Measurement of irregular volume (eureka can)

When an object is placed in a eureka can, water is displaced, equal to the volume of the object.



Calculation of density from results

The equation linking mass, volume and density is:

density = mass ÷ volume

density (kg/m^3) mass (kg) volume (m^3)

$\rho = m / v$ ρ = rho

Standard values for density

The following values are the densities for some common pure substances. You may be asked to calculate a density of an object in an exam and check if it is our by comparing your answer with the known density of the object.

water - 1.0 g /cm^3 gold - 19.3 g /cm^3 iron - 7.8 g /cm^3

ice - 0.9 g /cm^3 lithium - 0.5 g /cm^3 iridium - 22.6 g /cm^3

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