

# Measuring Density

## Organise the method used to measure density

- Calculate and record the volumes (length, width, height).
- Record your results in a table.
- For each object measure the: length, width, height.
- Record the results.
- Calculate and record the densities (mass ÷ volume).
- Include columns for volume, mass, density and substance.
- Measure the mass of each object using the digital balance.

Describe how adding sugar to water affects the density.

Mass of sugar dissolved in 0.1Kg of water (kg)	Density (kg/m <sup>3</sup> )
0.005kg	1000 kg/m <sup>3</sup>
0.01g	1005 kg/m <sup>3</sup>
0.015g	1007 kg/m <sup>3</sup>
0.02g	1009 kg/m <sup>3</sup>
0.025g	1012 kg/m <sup>3</sup>



Why do we not take into account the volume of the sugar?

How should the method be modified for measuring the density of a liquid. Write extra instructions below:

Density

**Formula**

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Rearrange this formula to find:

Mass = \_\_\_\_\_

Volume = \_\_\_\_\_

What are the units?

Mass is measured in \_\_\_\_\_

Volume is measured in \_\_\_\_\_

Density is measured in \_\_\_\_\_

## Plan

Without turning over (!) write a step by step plan for measuring the density of a solid.

## Convert the following units

1. 500g = ..... Kg
2. 25g = ..... Kg
3. 770g = ..... Kg
4. 58g = ..... Kg
5.  $10,000\text{cm}^3 = \dots\dots\dots \text{m}^3$
6.  $100\text{cm}^3 = \dots\dots\dots \text{m}^3$
7.  $250,000\text{cm}^3 = \dots\dots\dots \text{m}^3$
8.  $100,000\text{cm}^3 = \dots\dots\dots \text{m}^3$

### Help?

$$1000\text{g} = 1\text{kg}$$

$$\text{g} \rightarrow \text{kg} \div 1000$$

$$\text{kg} \rightarrow \text{g} \times 1000$$

$$1 \text{ m}^3 = 1,000,000\text{cm}^3$$

$$\text{m}^3 \rightarrow \text{cm}^3 \times 1,000,000$$

$$\text{cm}^3 \rightarrow \text{m}^3 \div 1,000,000$$

### Confident?

a.  $2\text{g} = \dots\dots\dots \text{Kg}$

b.  $34.5\text{g} = \dots\dots\dots \text{kg}$

c.  $0.5 \text{ g} = \dots\dots\dots \text{kg}$

d.  $10 \text{ cm}^3 = \dots\dots\dots \text{m}^3$

e.  $198 \text{ cm}^3 = \dots\dots\dots \text{m}^3$

f.  $2.5 \text{ cm}^3 = \dots\dots\dots \text{m}^3$

## Calculations:

1. A solid block has dimensions of 100 cm x 100cm x 100 cm and a mass of 500g. Calculate it's density.
2. A solid block has dimensions of 12 cm x 8 cm x 5 cm and a mass of 500g. Calculate it's density.
3. A solid block has dimensions of 6 cm x 8 cm x 4.5 cm and a mass of 273g. Calculate it's density.