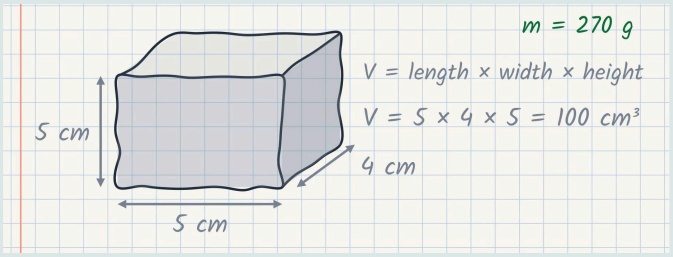
Required practical: density

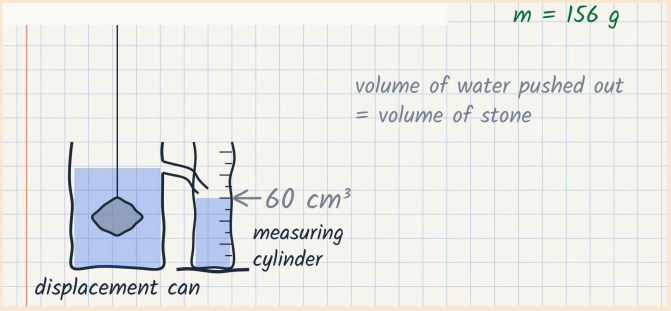
Blocks, stones and liquids

1 A regular block



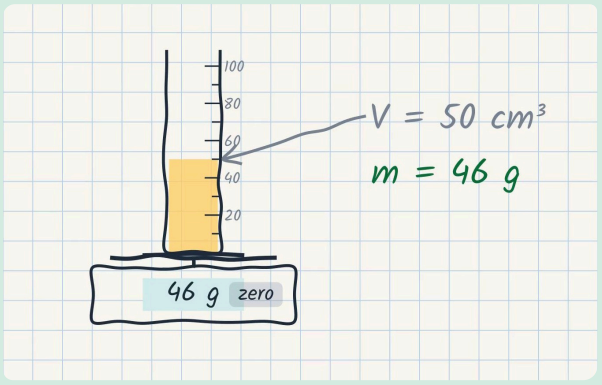
- Find the **mass** on a balance. Measure length, width and height with a ruler (vernier callipers or a micrometer are more precise).
- V = 5 × 4 × 5 = 100 cm³, so ρ = 270 ÷ 100 = 2.7 g/cm³ (2700 kg/m³)

2 An irregular object



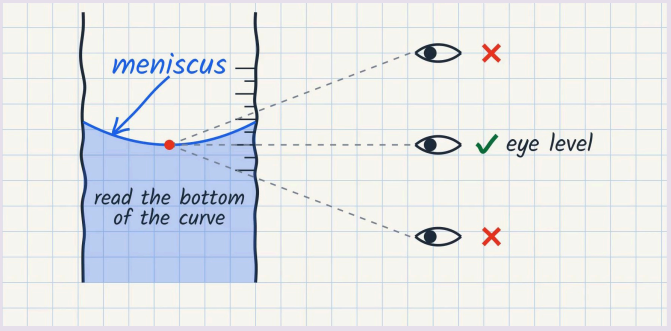
- Fill a **displacement can** until water drips from the spout, and wait until it stops. Lower the object in gently.
- The water pushed out (collected in a **measuring cylinder**) = the object's volume: ρ = 156 ÷ 60 = 2.6 g/cm³ (2600 kg/m³)

3 A liquid



- Put the empty measuring cylinder on the balance and press **zero**. Pour in a measured volume.
- The balance shows the liquid's mass: ρ = 46 ÷ 50 = 0.92 g/cm³ (920 kg/m³)

4 Making it accurate



- Read the **bottom of the meniscus** at eye level. Lower gently (no splashes), check for air bubbles, wait for the dripping to stop.
- Repeat each measurement and take a **mean** to reduce the effect of random errors.

$\rho = m \div V$

density = mass ÷ volume

ρ	density	kg/m³ (or g/cm³)
m	mass	kilogram (kg) or gram (g)
V	volume	m³ or cm³

g/cm³ × 1000 = kg/m³

Exam tip

Name the equipment and say what you measure with each one: "Use a measuring cylinder to measure the volume of water pushed out", not "measure the water".

Check yourself

- 1 A toy pushes out 25 cm³ of water and has a mass of 50 g. What is its density in g/cm³?
- 2 Why wait for the spout to stop dripping before lowering the object in?

Answers: 1. ρ = 50 ÷ 25 = 2 g/cm³ 2. So only the water pushed out by the object is collected.