Density: measuring mass and volume

Teacher / technician

YEAR 11 / LESSON 73 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Record actual measurements separately from labelled practice examples.

Coverage and delivery

Shared Physics / Double Award: 5.1, 5.3, 5.4. Density from direct mass and volume measurements.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, ten groups of three

Item	Per pair / setup	Class total
Smooth blocks ≤200 g	3 per group	30
Balance and measuring tool	1 set per group	10 sets
Booklets and calculators	1 per learner	30 of each

Immediate safety

Keep blocks on the bench and away from edges; do not stack or drop them. Check for sharp edges. Use callipers gently without trapping fingers. No heavy blocks or liquid displacement are required.

Preparation and delivery

Read alongside the student method

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1. Choose blocks with measurable dimensions and known safe handling surfaces. Check balance and measuring-tool resolution.

2. Provide three blocks per group and enough calculation space for repeated length, width and height readings. Do not supply expected densities as measured values.

Close of lesson

• Return blocks to trays and clear and zero balances.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- $\rho = m/V$.
- 20 cm^3.
- 2.7 g cm^{-3}.
- 2700 kg m^{-3}.
- To check repeatability and shape variation.
- Yes, if their volumes differ.

References and provenance

Pearson Physics specification

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.