Current and voltage: measuring different quantities

Teacher / technician

YEAR 10 / LESSON 41 / 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: 2.1, 2.8, 2.10. Current, voltage and resistance.

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
Low-voltage source, switch and two meters	1 set per group	10 sets
100 Ω and 220 Ω resistors, ≥0.5 W	1 each per group	10 of each
Insulated leads	7 per group	70
Booklets	1 per learner	30

Immediate safety

Disconnect before changing components or meter sockets. Never place an ammeter across the source. Keep voltage at or below 3.0 V and current limit at 0.05 A. Stop if a component warms unexpectedly; no mains connections are made by pupils.

Preparation and delivery

Read alongside the student method

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1. Prepare ten groups of three. Verify resistor values and power ratings, and set the source current limit to 0.05 A.

2. Demonstrate meter connections and check each circuit before energising. Use current readings in amperes, converting milliamperes where needed.

Close of lesson

- Switch off, disconnect sources and return components and meters.

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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- In series.
- Across the component, in parallel.
- It rises approximately in proportion.
- The 220 Ω resistor carries less current.
- The dial may differ from the voltage across the component.
- Ohm, Ω.

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.