Parallel circuits: current splitting and energy per charge

Teacher / technician

YEAR 10 / LESSON 48 / 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, 2.7, 2.17, 2.18, 2.20, 2.21. Parallel circuits and E = QV.

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
Source, switch and meters	1 set per group	10 sets
100 Ω and 220 Ω resistors	1 each per group	10 of each
Leads	10 per group	100
Booklets	1 per learner	30

Immediate safety

Disconnect before moving the ammeter or opening a branch. Keep source at or below 3.0 V with a 0.06 A current limit. An ammeter must be inserted in series with the measured path, never directly across the source.

Preparation and delivery

Read alongside the student method

YEAR 10 / LESSON 48 / PHYSICS + SCIENCE (DOUBLE AWARD)

1. Prepare ten groups of three and check the two nodes of each parallel circuit. The ideal total current at 3 V is about 44 mA, below the chosen source limit.

2. Demonstrate sequential current measurements with the source disconnected between changes; do not let pupils bridge a branch with the meter.

Close of lesson

• Switch off and disconnect all circuits before returning components.

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

YEAR 10 / LESSON 48 / PHYSICS + SCIENCE (DOUBLE AWARD)

- They are equal across the same two nodes.
- They add to the main current.
- No; the lower resistance carries more current at the same voltage.
- One joule transferred per coulomb.
- 15 J.
- Source drift could affect comparisons made at different times.

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.