Power: the same lift in different times

Teacher / technician

YEAR 10 / LESSON 23 / 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: 4.16–4.17. Rate of energy transfer.

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
Carrier with approximately 100 g total moving mass	1 per group	10 sets
Ruler/stopwatch/tray	1 set per group	10 sets
Balance	Shared	2
Booklets	1 per learner	30

Immediate safety

Stay seated and lift only the small approved load over the tray. Do not climb, race, use heavy weights or compare physical performance. Anyone may choose timing or calculation instead of lifting.

Preparation and delivery

Read alongside the student method

YEAR 10 / LESSON 23 / PHYSICS + SCIENCE (DOUBLE AWARD)

1. Use ten groups of three. Select secure carriers near 100 g total, measure actual mass and mark the 0.20 m height.

2. Demonstrate a gentle two-second and four-second lift without jerks. Provide the practice example for pupils who choose not to lift.

3. Teach useful power from the specified small lift and distinguish it from total metabolic power.

Close of lesson

• Lower loads gently into trays, count carriers and return stopwatches.

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 23 / PHYSICS + SCIENCE (DOUBLE AWARD)

- Watt, equivalent to joule per second.
- 0.196 J.
- 0.049 W.
- No; the same mass and height give the same mgh.
- To compare the rate for the same useful energy change.
- Stopwatch reaction time and defining the start/end positions.

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.