Conduction: comparing temperature changes

Teacher / technician

YEAR 10 / LESSON 26 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. A transient temperature comparison is not a direct measurement of thermal conductivity.

Coverage and delivery

Shared Physics / Double Award: 4.6, 4.9. Thermal conduction.

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

Requisition • class of 30, one staff demonstration

Item	Per pair / setup	Class total
Conductivity apparatus and spill tray	Staff demonstration	1 set
Thermometer and timer	Staff demonstration	1 each
Warm water, maximum 60 °C	To apparatus marked fill level	1 apparatus fill
Booklets	1 per learner	30

Immediate safety

Staff handle the warm-water reservoir on a stable tray. Keep hands away from heated bars and water. Do not use flames, sharp pins or molten wax. Report spills and allow the apparatus to cool before moving it.

Preparation and delivery

Read alongside the student method

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1. Pilot the specific indicator bars at or below 60 °C and verify a visible response. Use the manufacturer's fill level and stable support.

2. Use one projected demonstration for 30 pupils. If the bars cannot show a measurable change at this temperature, use a labelled recording and arrange the practical separately; do not invent observations.

Close of lesson

- Staff allow the apparatus to cool, drain it and dry the tray.

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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- From hotter towards cooler regions.
- No; energy transfers through interactions within the material.
- Mobile electrons transfer energy as well as lattice interactions.
- Distance affects the response and must be controlled.
- No; heat capacity, geometry, contact and losses also matter.
- Use matched bars, the same starting temperatures and bath conditions, then repeat after cooling.

References and provenance

Pearson Physics specification

IOP: thermal transfers

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.