Thermistors and LDRs: measuring resistance changes

Teacher / technician

YEAR 10 / LESSON 42 / PHYSICS + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. These are qualitative response investigations, not calibrated temperature or light sensors. Record repeat checks in the calculation space.

Coverage and delivery

Shared Physics / Double Award: 2.10, 2.11. Temperature and light-dependent resistance.

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

Requisition • class of 30, five groups of six

Item	Per pair / setup	Class total
Waterproof NTC thermistor and LDR	1 each per group	5 of each
Ohmmeter and leads	1 set per group	5 sets
Water-bath cups and tray	3 cups and 1 tray per group	15 cups; 5 trays
Thermometer, LED lamp, card and ruler	1 each per group	5 of each
Booklets	1 per learner	30

Immediate safety

Staff prepare water at 45 °C or below. Immerse only the rated waterproof sensor tip; keep meters and connections dry. No external supply is connected to the ohmmeter circuit. Use a cool LED lamp, not a hot filament lamp.

Preparation and delivery

Read alongside the student method

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1. Check the thermistor is an NTC type and its sheath is rated for immersion. Use five groups of six with staff-prepared baths and trays.

2. Pilot suitable meter ranges and allow thermal settling. For an unsealed component, use an approved dry sleeve with adequate settling time; do not immerse exposed leads.

Close of lesson

• Switch off lamps and meters, allow water to cool and dry sensor tips before storage.

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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- It decreases.
- It generally decreases.
- An ohmmeter supplies its own small test current; external power can damage it or invalidate readings.
- Its temperature must approach that of the bath.
- No; it is a qualitative comparison.
- To check drift or repeatability.

References and provenance

Pearson Physics specification

IOP: component characteristics

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.