

Building and drawing simple circuits

Grade 6 science (Year 7 · Class 6) · Lab

Name: _____ Date: _____ Class: _____

Which everyday objects let electric current flow? In this lab you build a tester circuit with a cell and a bulb and place each object in a gap. The brightness of the bulb lets you sort conductors from insulators, and a painted key shows why surface coatings matter.

Level: Grade 6 science (Year 7 · Class 6) · **Curriculum:** MS-PS2-3

Aim

To find which everyday objects conduct electricity, using a simple tester circuit.

Equipment

- One 1.5 V cell in a holder
- One 1.5 V bulb in a holder
- Four connecting wires with crocodile clips
- Ten objects: iron nail, copper wire, aluminium foil, pencil lead, plastic ruler, rubber eraser, glass slide, wooden stick, coin, painted steel key

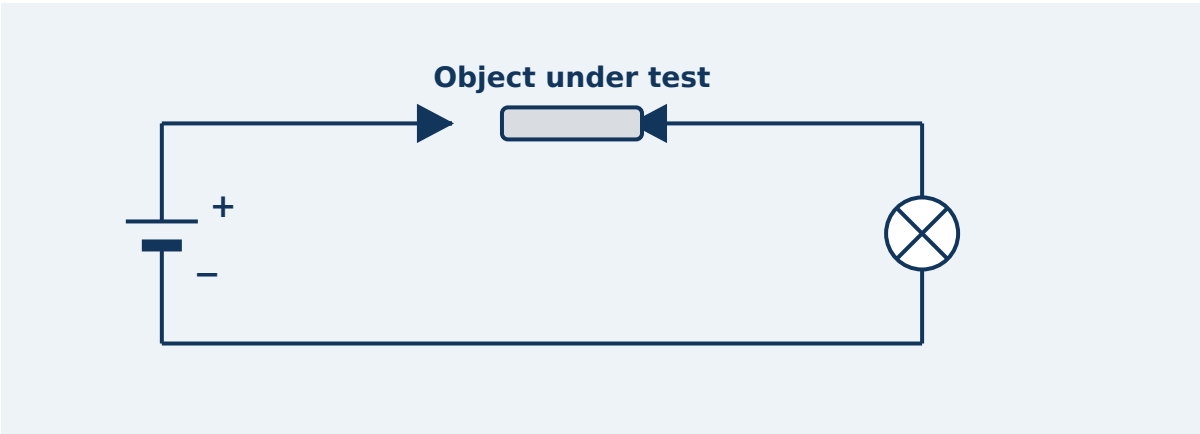
Safety

Safety

Use only the cell supplied. Never connect any part of the circuit to a mains socket. Do not leave the circuit connected for long, because wires and the cell can become warm.

Method

1. Build the tester circuit shown, leaving a gap between two clips.
2. Check that the bulb lights when the two clips touch each other.
3. Attach the clips to the first object and record whether the bulb is bright, dim or off.
4. Repeat for the other objects. For the painted key, test the painted handle and then a scraped or unpainted part.
5. Classify each object as a conductor or an insulator.



Clip the object between the two clips and watch the bulb.

Results

Sample measurements:

Object	Material	Bulb
Iron nail	Iron	Bright
Copper wire	Copper	Bright
Aluminium foil	Aluminium	Bright
Pencil lead	Graphite	Dim
Plastic ruler	Plastic	Off
Rubber eraser	Rubber	Off
Glass slide	Glass	Off
Wooden stick	Wood	Off
Coin	Metal alloy	Bright
Painted key: handle	Paint	Off
Painted key: bare blade	Steel	Bright

Analysis questions

Question 1 Classification

Use the results to make a list of conductors and a list of insulators.

Question 2 Pattern

State a pattern for the materials that conduct and the materials that do not.

Question 3 The painted key

Explain why the key gave two different results.

Question 4 Dim bulb

Suggest why the bulb was dim with the pencil lead.

Question 5 Fair test

State two things that should be kept the same for every object.

Question 6 Safety

Explain why the tester must never be made with mains electricity.

Question 7 Improvement

Suggest how to make the results more precise.