

SCIENCE · Y4 & Y6

Electricity

Knowledge Organiser — Year 4 & Year 6 Science

Key vocabulary

1

Circuit

A complete loop that allows electricity to flow.

2

Cell

A single battery unit that stores chemical energy and releases electrical energy.

3

Battery

Two or more cells joined together.

4

Conductor

A material that lets electricity flow through it. Most metals are conductors.

5

Insulator

A material that does NOT let electricity flow through it. Plastic, rubber, wood.

6

Switch

A component that opens or closes a circuit. Lets you turn things on/off.

7

Voltage

The 'push' that makes electricity flow. Measured in volts (V). More voltage = more push.

8

Current

How much electricity flows past a point each second. Measured in amps (A).



9

Component

Any part of a circuit (bulb, buzzer, motor, switch, wire, cell).

10

Series circuit

All components on a single loop. If one breaks, all stop working.

11

Parallel circuit

Components on separate paths. One can break without stopping the others.

a circuit works

What makes a bulb light up?

- Electricity flows from the BATTERY around the circuit and back to the battery.
- It must be a COMPLETE LOOP — any break stops the flow.
- Wires carry the electricity. The cell pushes it (voltage).
- When current flows through a bulb, it heats a thin wire (filament) so it glows.
- When current flows through a buzzer, it vibrates and makes sound.
- When current flows through a motor, the motor spins.
- Adding MORE CELLS = brighter bulbs, louder buzzers, faster motors.
- Adding MORE BULBS in a series circuit = each one is dimmer.

conductors and insulators

Materials test results

- CONDUCTORS (electricity flows easily): copper, aluminium, gold, silver, iron, steel, water (with impurities), human body
- INSULATORS (electricity does NOT flow): plastic, rubber, glass, wood (dry), pure water, paper, fabric
- MOST METALS are conductors. MOST NON-METALS are insulators.
- Wires have a copper inside (conductor) wrapped in plastic (insulator) — for safety.



- Plug pins are made of brass (conductor); plug body is plastic (insulator).
- WATER conducts electricity if it has minerals — that's why electricity + water is dangerous.

Electrical symbols

How circuits are drawn

- Cell = long line + short line
- Battery = several cells joined
- Bulb = circle with X inside
- Switch (open) = line angled away from gap
- Switch (closed) = line straight across
- Buzzer = circle with arc inside (semicircle)
- Motor = circle with M
- Wire = straight line
- Symbols are STANDARD WORLDWIDE — same in every country

Safety with electricity

Important rules

- Never put metal (or anything) into plug sockets.
- Never use electrical things near water — electricity + water = dangerous.
- Never touch electrical wires with bare hands if they're frayed or damaged.
- Never overload a plug socket with too many adapters.
- Mains electricity (in the wall) is MUCH stronger than battery electricity — can kill.
- Storms: stay indoors. Lightning is electricity finding a path to ground.
- If someone gets an electric shock, do NOT touch them — turn off the power first.



