

Science Knowledge Organiser - Year 4

Unit: What is electricity and how does it travel?

Key Vocabulary:

appliance	An appliance is a device that is designed to perform a particular job, such as a washing machine.
battery	A battery is a device that stores electrical energy as a chemical.
circuit	Circuits are pathways that electricity can flow around.
conductor	If a material is a conductor , it allows an electrical charge to pass through it easily.
current	A current is a flow of electrons moving around a circuit.
electricity	Electricity is the flow of an electric current or charge through a material.
electrons	Electrons are very small particles that have a negative charge of electricity.
insulator	If a material is an insulator , it does not allow an electrical charge to pass through it.
non-renewable	Energy sources that are non-renewable will eventually run out.
renewable	Energy sources that are renewable will not run out.

Science Skills:

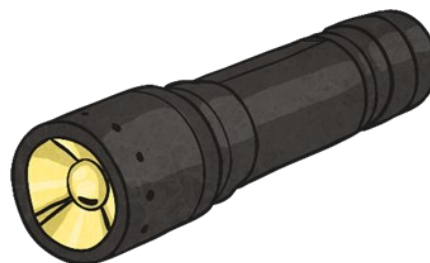
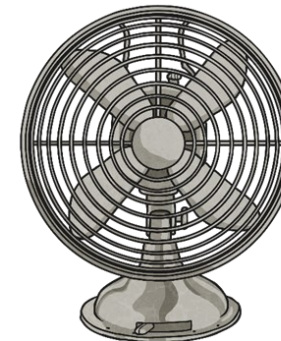
- Identify common appliances that run on electricity.
- Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
- Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.
- Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.
- Recognise some common conductors and insulators, and associate metals with being good conductors.
- Set up simple practical enquiries, comparative and fair tests.
- Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.
- Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
- Make systematic and careful observations and, where appropriate, take accurate measurements using standard units.

Key Facts:

- **Electricity** occurs naturally.
- Primary sources of energy - some **renewable** and some **non-renewable** - are used to generate **electricity**.
- **Electricity** can only flow around a complete **circuit** that has no gaps.
- Electrons in **insulators** cannot move freely; some of the electrons in **conductors** can move freely.
- A **circuit** with a switch is not the same as an incomplete circuit.

Electrical Appliances

Some electrical **appliances** need to be plugged into the mains **electricity** and others have **batteries**.



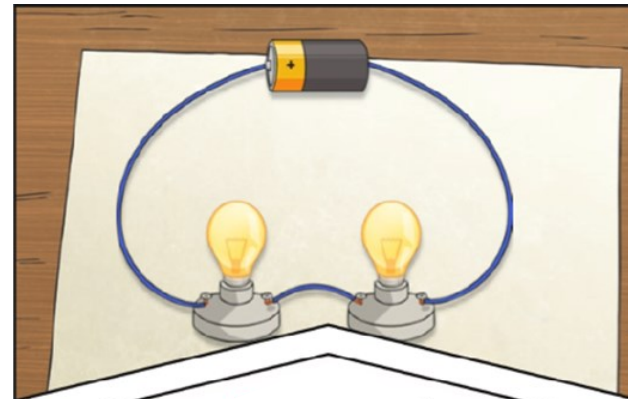
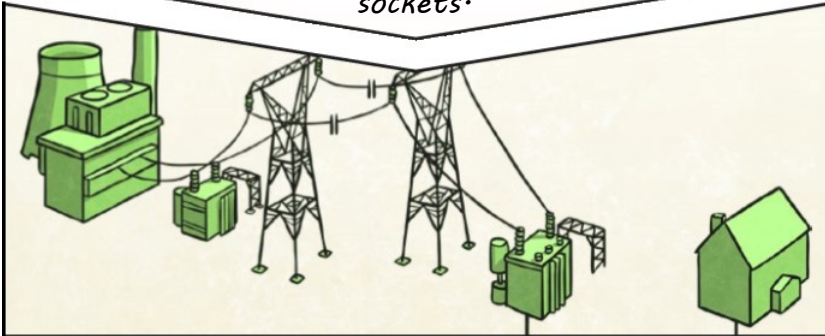
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Types of Electric Current

Mains Electricity

Power stations send an electric charge through wires to transformers and pylons. Then, underground wires carry **electricity** into our homes via wires in the walls and out through plug sockets.



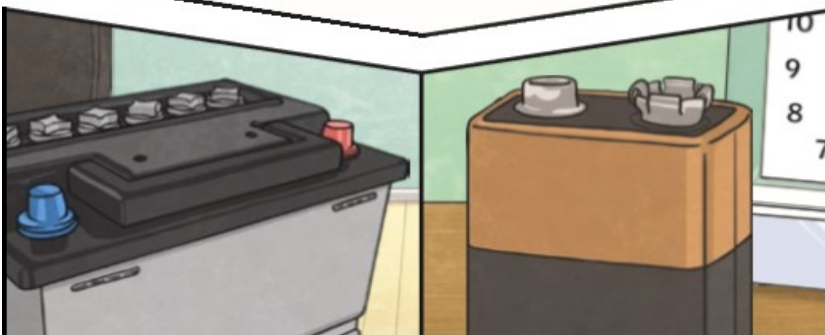
Switches can be used to open or close the **circuit**. When off, a switch 'breaks' the **circuit** to stop the flow of **electrons**. When on, the **circuit** is complete and the **electrons** flow.



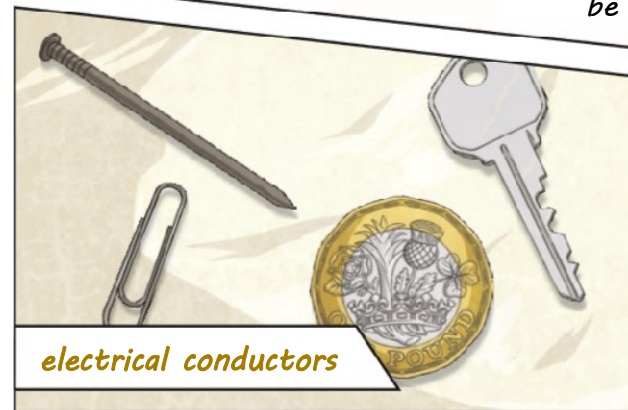
Electricity can only flow around a complete **circuit** that has no gaps. There must be wires connected to both the positive and negative end of the power supply.

Battery Electricity

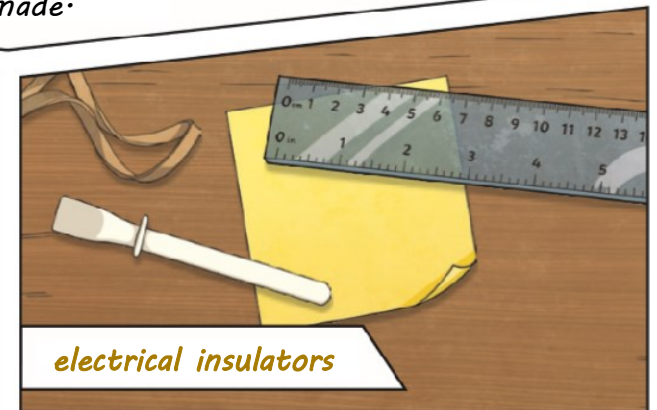
Batteries store chemicals which produce an electric **current**. Eventually, these **batteries** (even rechargeable **batteries**) will stop producing an electric **current**.



A **conductor** of **electricity** is a material that is made up of free **electrons** which can be made to move in one direction, creating an electric **current**. Electrical **insulators** have no free **electrons** and so no electric **current** can be made.



electrical conductors



electrical insulators