

Key Facts

Types of electricity

There are two main categories of electricity. These are mains and battery. Mains electricity is transmitted from a plugged in source. It is provided by a power station that sends the electricity to your homes, which you access through sockets.

Battery electricity uses chemical reactions to make electricity. It stores electrical energy that can be activated when connected to make a circuit.

Conductors and Insulators

Some materials enable electricity to pass through them whilst others do not. The former are known as conductors and the latter are insulators. Conductors and insulators are chosen to make different parts of everyday objects.

Circuits

Electricity runs through the majority of appliances we use everyday such as: remote controls, computers and phones. They work based on a circuit. This is a route which allows the electrical current to flow through.



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Science

Year 4

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Switched on

Vocabulary

Word	Definition
Battery	A battery is a collection of cells and will have a voltage which is a multiple of 1.5.
Bulb	A device made of rounded glass used to create electric light.
Cell	A cell is a single unit of electrical supply providing a voltage of 1.5V.
Circuit	Electric circuits are paths for transmitting electrical current or moving electricity.
Conductor	Materials with electrons which can move easily have very low resistance to the flow of electricity and are electrical conductors .
Electricity	Electricity (or electrical current) is a flow of electrons (negatively charged particles) which transfers energy.
Insulator	Materials which do not allow electricity to flow through them are known as electrical insulators .
Switch	A switch is a means of controlling the flow of electricity in the circuit. When the switch is open the circuit is broken: there is a gap which prevents electricity from flowing. When the switch is closed the circuit is made and electricity flows.
Voltage	The voltage of a battery is a measure of how much energy (or 'push') it can provide.

Common misconceptions:

Mains electricity and batteries are entirely different things - battery powered devices are not electrical.

Electricity goes to rather than through a component so only one wire is needed. In this model electricity is seen as a fuel used by the component rather than a flow through it.

Mains electricity only requires one wire (because the different wires within the single cable are not visible).

Electricity is something which is made by the battery and has to travel to the component rather than flowing in all parts of the circuit at once.

A switch will only control a component if it is 'before' the component in the circuit.

Water conducts electricity. Although it is a rule of electrical safety not to mix electricity and water, pure water does not conduct; it is the impurities in tap water which allow it to conduct electricity.

Knowledge and Understanding:

Children will learn:

- In this module they will identify electrical appliances, distinguishing between those which are powered by mains and battery (including those with integral rechargeable batteries) and recognising that electricity can be used to produce light, sound, heat and movement.
- They will explore the production of light, sound and movement by making simple series circuits with cells, wires, bulbs, buzzers and motors, learning the names of the components. They will work mostly with single components.
- Through detailed observation and role play they will be able to describe the flow of electricity round a circuit and give reasons why some circuits do not work. They will then learn to control their circuits with switches.
- They will test materials, classify them as electrical conductors or insulators and recognise that metals are good conductors and plastics are good electrical insulators.
- Throughout this module they will learn the safe use of electrical components and the dangers of mains electricity.

Key skills and concepts:

Children will be able to:

- When working scientifically children will **make observations** and describe how circuits work using scientific language.
- They will also communicate using **labelled and annotated drawings**. Drawings are an important way for children to demonstrate their developing understanding.
- They will **plan and carry out a classifying enquiry**, recording findings using tables, Venn and Carroll diagrams and will recognise that generalisations cannot be made from small amounts of evidence.

Key Questions

What are some good conductors and insulators?

How can a switch be used to affect a light bulb in a circuit?

What type of electricity is provided by a power station?

What are some ways we can make sure we are safe whilst using electricity?

Which part of a circuit provides the source of electricity?

Which component in a circuit allows the electricity to flow to all the other components?