Science

Topic: Electricity
Year 4

What I should already know

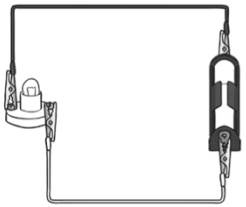
- That some things need electricity to work
- That some things need batteries to work
- That electricity can be dangerous

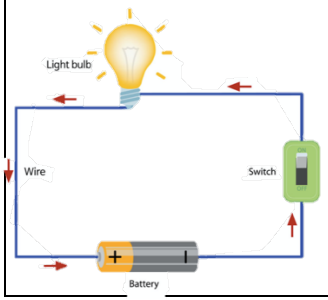
Common appliances use electricity

Many of the items that we use every day run on electricity. Electricity can be supplied from the mains (these are plugged into power supplies) or from batteries. Below are a selection of appliances that run on electricity:

Key knowledge - Circuits

Electricity (or electrical **current**) is a flow of electrons which transfers energy. A **complete circuit** is required for electricity to flow and the **cell** is the power source for the **circuit**, which creates the flow of electricity. The flow of electricity (which carries energy) through a bulb, **motor** or **buzzer** is what makes it work.





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. There are many different types of switch.

Key knowledge – dangers of electricity

Common electrical hazards

It is important to work safely with electricity.

1. Overloading a plug extension socket.
2. Exposed **wires**.
3. Damaged wall sockets.
4. **Wires** left along the carpet for people to trip over.
5. Placing metal into electrical appliances or open sockets.
6. Electrical appliances and wires near water.

Water is an excellent electrical conductor so it can be very dangerous to have electrical devices near water.

Key knowledge - Conductors and Insulators

Electrical **conductors** - let electricity pass through or along them and produce a **complete circuit** because they are materials with electrons which can move easily and have very low resistance to the flow of electricity e.g. copper, iron, steel, silver, gold. Metals are good electrical **conductors**.

Electrical **insulators** - do not let electricity pass through or along them e.g. **r**ubber, wood, plastic, paper. Most non-metals are electrical **insulators** although graphite, a form of carbon, is an exception.

Vocabulary

circuit	A complete route which an electric current can flow around.
current	A flow of electricity through a wire.
physics	The study of forces including electricity and the way if affects objects.
battery	A series of cells that provide power for electrical items.
cell	A device used to generate electricity.
component	Any part of an electrical circuit.
conductor	Any material that electricity can pass through or along.
insulator	Any material that electricity cannot pass through or along.
buzzer	An electrical device that makes a buzzing sound.
motor	A device that changes electrical energy into movement.
wire	A long thin piece of metal that carries an electrical current often covered in plastic for safety.
voltage	An electrical force that makes electricity move through a wire, measure in volts (V).

Key knowledge - Thomas Edison

Thomas Edison was born in 1847 and died in 1931. He lived in the state of New Jersey in the United States of America (USA)
He is known as one of the greatest inventors in history.
He invented the **light bulb**, the phonograph (which could record and play sound) and an early video camera called the Kinetograph. The films were then watched on a Kinetoscope which he also invented.