

Electrical circuits and conductors

Electricity

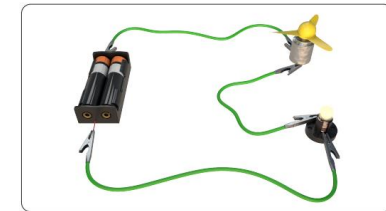
Electricity is a form of energy used to power many everyday items, such as kettles and mobile phones. It is essential to our daily lives. Lighting buildings, watching television, using computers, cooking meals and keeping in touch with family and friends all rely on electricity.



Circuits

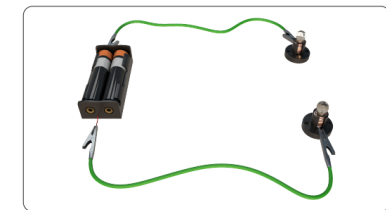


A circuit is a collection of components connected by wires through which an electric current can flow. If a circuit forms a complete loop with a single path for electric current to flow, it is called a series circuit. When an electric current flows through all the components of a circuit, it is called a complete circuit. A complete circuit has no gaps and can make a lamp light up, a buzzer sound or a motor move.



complete series circuit

When an electric current cannot flow through all the components of a circuit, it is called an incomplete circuit. Missing wires, open switches, loose wire connections or broken components create gaps, which stop the electric current from flowing around the circuit



incomplete series circuit



Safety



Mains electricity is very powerful. If not used carefully, it can be dangerous, causing fires, burns, electric shocks and death. Electricity can be dangerous when people overload plug sockets, touch electrical items with wet hands or touch damaged wires. It is important to use electrical appliances safely.



cell



battery

Sources of Electricity



Electricity comes from two sources, mains electricity and cells. Mains electricity is used when we turn on a light switch or plug an electrical appliance into a socket. Cells contain chemicals that create electrical energy. They are usually used to power small, portable devices, such as torches. A battery is made of two or more cells.

Components

All electrical items are made up of components, which make them work. Components have different jobs. A cell and battery provide electrical power. A wire connects different components and conducts electric current. A lamp emits light. A switch makes or breaks a circuit. A buzzer makes a sound. A motor creates movement.



The metals silver, copper and gold are the three best conductors of electricity. Some non-metals, such as graphite, also conduct electricity. Most other materials are non-conductive



Vocabulary

conduct	To allow electricity to pass through.
electric current	The flow of electric charge through a circuit.
LED	Light-emitting diode. A device that emits light when part of a complete circuit.
renewable	Something that can be used and then easily replaced.
resistance	The ability of a conductor to oppose the flow of electric current.