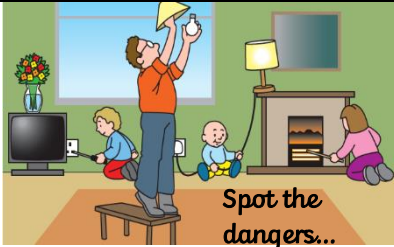


Key Vocabulary	
Cell	From the Latin <i>cella</i> meaning storeroom or chamber. A cell is a unit in a device containing electrodes immersed in an electrolyte, used for converting chemical or solar energy into electricity.
Battery	A container consisting of one or more cells, in which chemical energy is converted into electricity and used as a source of power.
Mains electricity	The term used to refer to an electricity supply from power stations to households. It is supplied as alternating current of 50 cycles per second (50 hertz).
Rechargeable	Able to have its electrical energy restored by connection to a power supply.
Bulb	Glass bulb which, when inserted into a lamp or socket, provides light by passing an electric current through a filament or pocket of inert gas.
Filament	A conducting wire or thread with a high melting point, forming part of an electric bulb.
Inert	Chemically inactive, so will not react to high temperatures caused by electrical currents.
Circuit	A complete and closed path around which a circulating electric current can flow.
Components	From Latin <i>com-</i> (together) and <i>ponere</i> (put). A part of a larger whole.
Terminals	A point of connection for closing an electric circuit.
Wires	Metal drawn out into the form of a thin flexible thread.
Switch	A device for making and breaking the connection in an electric circuit.
Conductor	A material or device that transmits heat, sound or electricity.
Insulator	A substance or device which does not readily allow the passage of heat, sound or electricity.
Motor	A machine powered by electricity or internal combustion, enabling movement of it or another device.
Buzzer	An electrical component that makes a buzzing noise and is used for signalling.
Shock	A sudden upsetting or surprising event or experience, when caused by electricity is called an electric shock.
Safety	The condition of being protected from or unlikely to cause danger, risk or injury.

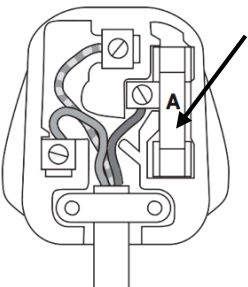
- Useful historical facts**
- Very simple batteries were used over 200 years ago. Alessandro Volta invented the first true battery in 1800.
 - Michael Faraday discovered how an electric motor might be made between 1820 and 1830.
 - The first plugs and sockets were introduced into England by T. T. Smith in 1883. The ones we use today are better built and much safer to use.
 - Thomas Edison did not invent the first light bulb but was the first person to enable them to be used reliably by the public.

Safety rules

- 1- Keep appliances away from water
- 2- Do not put more than one plug into a wall socket
- 3- Make sure all electrical cables are neat and tidy
- 4- Do not put your fingers or other objects into appliances or sockets
- 5- Never use an appliance unless an adult says it's safe
- 6- Keep small children away from anything electrical.

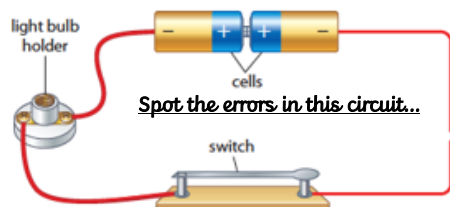


Staying safe with mains electricity



The part labelled A is called a fuse. The fuse is included inside every plug on an electrical appliance. It contains a strip of wire which melts and breaks an electrical circuit if the current exceeds a safe level. The sole purpose of this is to act as a safety device. Sometimes electrical storms create lightning bolts which can increase the current flowing to a house. This can cause the fuses to blow, preventing the appliances from catching fire, but also breaking the circuit.

Simple series circuits

















In a series circuit all components are joined together and there is only one way around. When the switch is pushed down, the lamp will light up. When the switch is opened, the circuit will be broken and the lamp will turn off. However, circuits will not work if:

- * cells are not connected properly (the + terminal has to be connected to the - terminal)
- * there has to be a bulb in the bulb holder
- * the circuit is not free from gaps.
- * one of the components does not let electricity through it.

- Some people think that bulbs use up electricity. This is untrue. Electricity continues to flow around a circuit provided there is enough current from the cell or battery. Bulbs are lit using the energy carried by the electrical current.
- Another error people often make is thinking that batteries produce electricity. Again, this is untrue. The two terminals of a cell or battery allow electricity to flow out at one terminal and back in at the opposite terminal. Adding more cells to a series circuit increases the flow of electrons carrying energy (the current). This means the bulbs can shine brighter. However, adding more bulbs without increasing the number of cells will reduce the brightness of each bulb as the energy is being used by each bulb as the electrons move through the circuit.

Electrical component diagrams and pictures

						
Cell	2 cell battery	Motor	Bulb	Switch open	Switch closed	Buzzer
						

Electrical conductors	Electrical insulators
Metals such as iron, copper and gold are good examples of electrical conductors. Carbon is an example of a non-metal which conducts electricity well. Our bodies contain around 18% carbon, and it is contained in every cell, which is why electricity is so dangerous to us. Water is also a very good conductor of electricity, which is why we do not use electrical appliances around water.	Materials such as wood, leather and plastic are good examples of electrical conductors. Plastic is used to cover electrical wires, as this prevents the electrical current from accidentally being conducted by another material on its way around a circuit. This is why it is essential to check electrical appliances for breaks in the plastic covers providing this essential insulation.

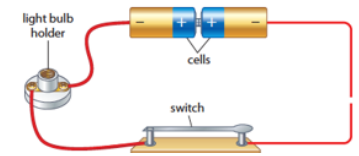
Quiz

Complete this sentence: **Mains supplied electrical appliances are different to battery powered appliances because...**

- A. mains electricity is a complete and closed path around which a circulating electric current can flow.
- B. mains electricity has a conducting wire or thread with a high melting point, forming part of an electric bulb.
- C. mains electricity is an electricity supply from power stations to households.
- D. mains electricity is a point of connection for closing an electric circuit.

Which of the following is not an error in this series circuit?

- A. Wires connected to both terminals of the bulb holder.
- B. No bulb in the bulb holder.
- C. A break in the wire between the battery and the switch.
- D. Cells in the battery positioned incorrectly to allow a flow of electrons around the circuit.



Which of the following cannot be true?

- A. Electricity is very dangerous to humans because electricity is conducted through carbon, iron and water which are all found throughout our bodies
- B. Electricity is conducted by plastic helping the flow of energy to move through a closed circuit.
- C. Electricity is insulated by leather so this helps us stay safe from electric shocks
- D. Electricity is insulated by wood so this can help us stay safe from electric shocks.

Complete this sentence: **The function of a switch in an electrical circuit is to ...**

- A. act as a safety mechanism for an electrical circuit.
- B. generate light in an electrical circuit.
- C. generate sound in an electrical circuit.
- D. open (break) and close (complete) an electrical circuit.

Which of the following is not an appliance that is powered by electricity?

- A. Television
- B. Kettle
- C. Lamp
- D. Fireplace

Recognise common conductors

Which of the following is not a conductor of electricity?

- A. Iron
- B. Copper
- C. Wool
- D. Carbon

Which of the following is the symbol for a motor?

- A.
- B.
- C.
- D.

Recognise common insulators

Which of the following is not an insulator of electricity?

- A. Iron
- B. Plastic
- C. Wood
- D. Leather