

Electricity - Direct Current

Radios need electricity to operate. Electric current is the flow of electrons in a circuit.

Batteries produce **Direct Current (DC)** which only flows in one direction.

Batteries have a positive and a negative terminal.

There are many types of batteries. Some batteries can be recharged while others cannot.

1. Name 2 devices which use rechargeable batteries.
How do you know when these devices are fully charged?

1. _____ 2. _____

2. Find 2 different types of batteries which cannot be recharged and draw pictures of them. Mark the positive terminal (+) and the negative terminal (-).



Note the voltage of each battery.

3. Name 2 devices which use "button batteries".

1. _____ 2. _____

Batteries can be dangerous in a number of ways.

Button batteries must remain in the child-resistant packaging or sealed in a secure compartment when used in a device. If swallowed seek medical attention immediately. Never cut open a battery as some have very corrosive chemicals in them and can explode if they are damaged. Batteries should not be left unattended when charging as they may overheat and catch fire. All used batteries should be disposed of by taping the ends and taking them to a recycling centre. Remove batteries from devices when being stored away.



Electricity - Alternating Current

Electricity from the mains power point is **Alternating Current (AC)** because it flows backwards and forwards.

1. Draw the connections on a mains power point and a power cord plug.

Mains power plugs should have 3 pins. The middle pin is the Earth connection. The circuit symbol for Earth is



2. Mark the Earth connections on your diagrams.

Battery chargers and power packs change AC to DC so that devices which require DC can be run using mains power.

3. Check on the back of a battery charger or power pack for its electrical ratings. Write them here.

Rechargeable batteries store a lot of energy. Do not overcharge or overheat them. Never leave them unattended and be careful not to short-circuit them.

Fuses are devices in electrical circuits which stop the electricity flowing when an appliance is faulty. The circuit symbol of a fuse is



4. Where would you expect to find a fuse?

It is important to be careful when dealing with electrical appliances, whether they be mains powered or battery operated. Electricity can be deadly if handled inappropriately.

5. List 6 safety rules that you know.

1.	2.
3.	4.
5.	6.



Electrical Circuits

Electric current (I) is the flow of electrons through a circuit which is measured in Amps.

Electric voltage (E) measured in Volts is the "force" which pushes the electrons to make them move.

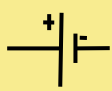
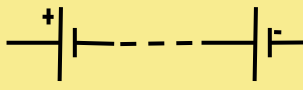


Electrical resistance (R) measured in Ohms (Ω) slows down the current as it flows in a circuit.

1. Find a torch and take it apart carefully.
2. Draw a picture of the parts showing how they fit together.

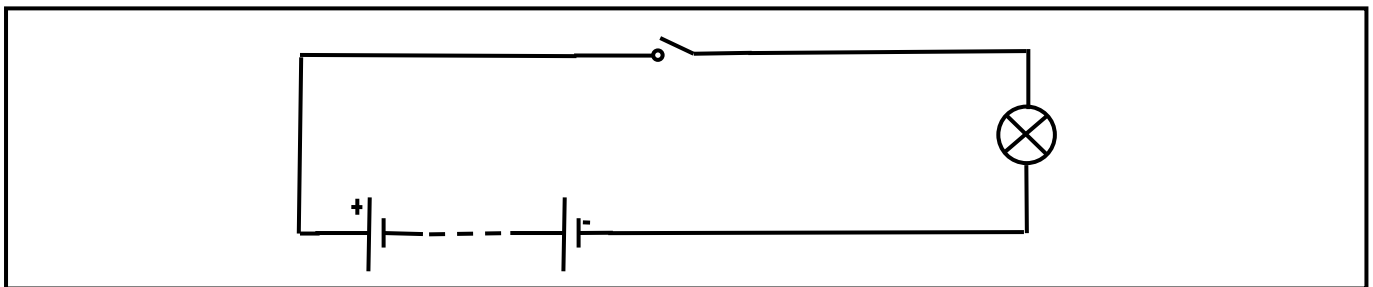


Which way do the batteries go? How is the bulb connected to the batteries?

Electrical components come in all shapes and sizes so they are represented by standard symbols when drawing a circuit diagram.

Cell - single unit of a battery 	Battery - a group of electrical cells 
Switch - used to turn electricity on and off 	Lamp - lights up when electricity flows 

3. Here is the circuit diagram for a torch. Name the circuit symbols used in the diagram.



4. Explain what is needed for the electricity to get to the light bulb to make it glow.

Insulators are materials which stop the flow of electricity.

Materials such as plastic or ceramic are insulators.

Conductors are materials which allow electricity to flow through them easily.

Metals are conductors.

5. Name the parts of the torch which are conductors and those which are insulators. Why are both necessary?

