



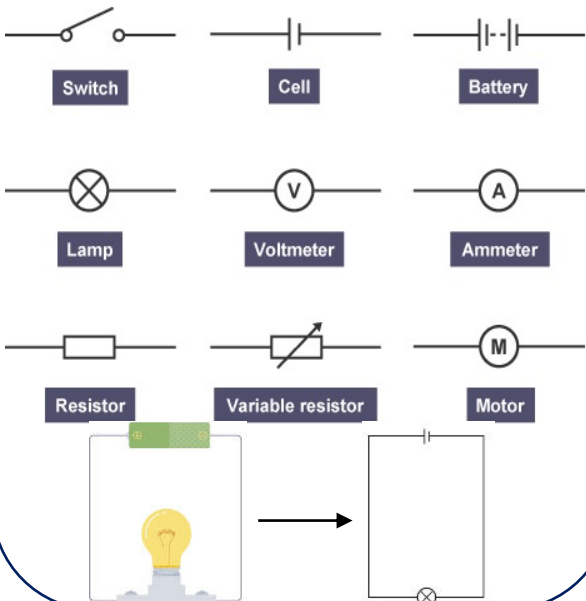
Year 7 Electricity and magnetism



Keyword	Definition
Ammeter	A device used to measure current.
Atom	An atom has a nucleus which is positively charged and electrons which are negatively charged
Battery	A battery is a source of energy which provides a push - a voltage - of energy to get the current flowing in a circuit.
Compass	A compass is a tool which points out directions, such as North, South, East and West.
Conduct	Allow electricity to flow through them easily
Current	An electric current is a flow of charge, and in a wire this will be a flow of electrons.
Electromagnet	When an electric current flows in a wire, it creates a magnetic field around the wire. This effect can be used to make an electromagnet
Electrons	The electron is a negatively charged particle that spins around the outside of the nucleus
Potential difference	A measure of the difference in energy between two parts of a circuit (measured in volts).
Resistance	Resistance is a measure of how difficult it is for current to flow through a material.
Static electricity	Friction between two different insulating materials can transfer electrons from one to the other.
Voltmeter	A device used to measure potential difference.

Circuit symbols

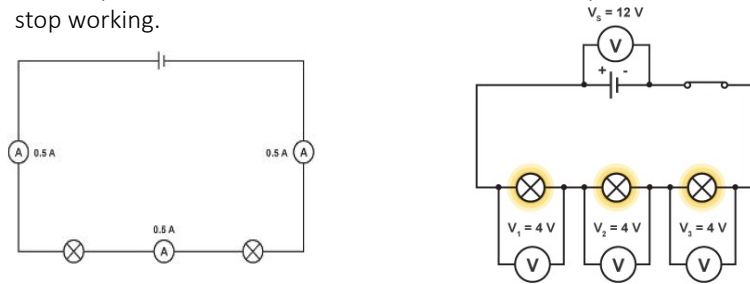
We use circuit symbols to draw diagrams of electrical circuits with straight lines to show the wires connecting everything together.



Series circuits

In a series circuit:

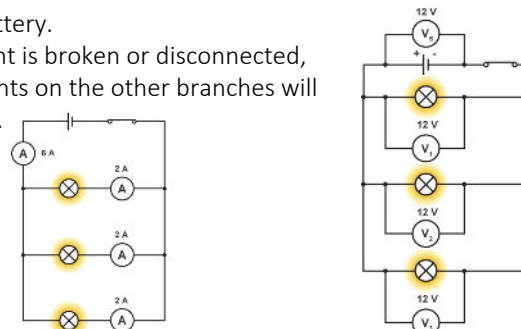
- Components are in one loop, so the charge has only one path to follow.
- Current is the same everywhere.
- The potential difference is shared between the components.
- If a component is broken or disconnected all the components will stop working.



Parallel circuits

In a parallel circuit:

- Components are connected in different branches.
- Current is shared between the branches, then adds again when the branches meet.
- Potential difference is the same across each of the branches as across the battery.
- If a component is broken or disconnected, the components on the other branches will keep working.

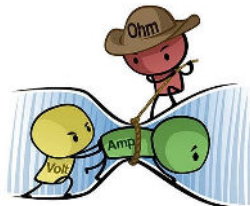


Resistance

- Resistance is a measure of how difficult it is for current to flow.
- Metals conduct as they have a low resistance to the current flowing.
- Non-metals do not conduct current and so have a high resistance.

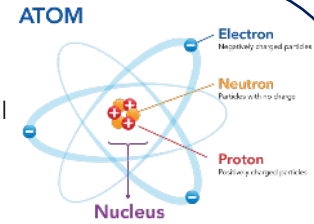
- There is a relationship between the current, potential difference and resistance in a circuit.

- Current is measured in amperes (A).
- Potential difference is measured in volts (V).
- Resistance is measured in ohms (Ω).



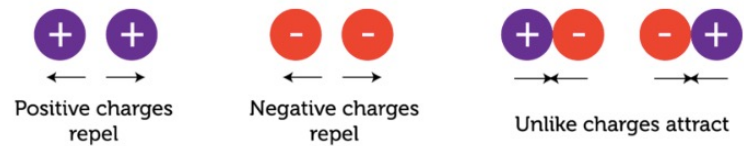
Static electricity

Atoms have positively charged protons and negatively charged electrons in equal quantity so atoms are neutral (have no overall charge).

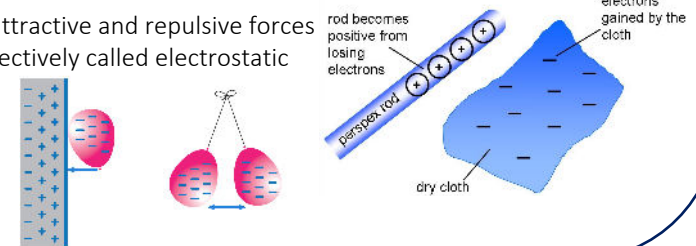


When two insulating materials are rubbed together, electrons can pass between them which is called static electricity. The material which has lost electrons becomes negatively charged and the material which gained electrons becomes positively charged.

Charged objects have a field around them and the closer you are to the object, the stronger the field is.

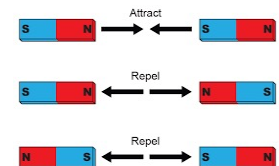


These attractive and repulsive forces are collectively called electrostatic forces.

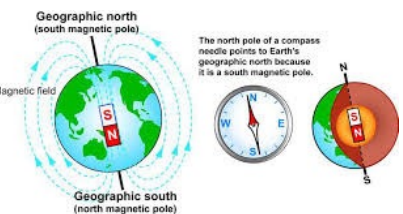


Magnetism

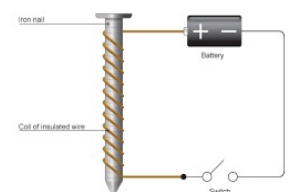
- Magnetism is a non-contact force.
- There are three magnetic metals: iron, nickel and cobalt. Steel is also magnetic because it contains iron.
- A bar magnet is a permanent magnet. It has a north pole and a south pole.
- Unlike poles attract, like poles repel.



- A compass contains a small Magnet which rotates to align itself with a magnetic field.
- The North seeking end of the compass is the south pole of a Magnet.



- An electromagnet can be made by coiling a wire around an iron core and passing a current through it.
- Current, number of coils and the material the core is made of all affect the strength of the electromagnet.



Useful YouTube links:



[Circuits](#)



[Static electricity](#)



[Magnetism](#)

Skills:

Safety

Always be extremely careful when using electrical devices.

Staying Safe with Electricity

- Don't pull wires.
- Don't put your fingers in sockets.
- Don't fly kites or climb trees near power lines.
- Don't use radios or hair dryers near water.

