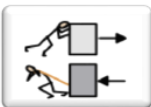


Magnets & Forces

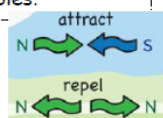


Forces

A force is a push or a pull. Forces cannot be seen, but it is possible to see what forces do. When a force is applied to an object, it can change speed, direction of movement or shape. Some forces are **contact forces**. This is where objects must be **touching** each other to apply a force. **Non-contact forces**, such as gravity and magnetism, act between two objects that are **not touching** each other. Some forces can be measured in newtons (N) using a force meter.

Magnetism

A magnet is a material or object that produces an invisible magnetic field. A magnetic field causes the force of magnetism that pulls on magnetic materials and attracts or repels other magnets. The two ends of the magnet are where the force is strongest. These are called the north and south poles.



Friction

Friction is the force between two surfaces moving across each other. It acts in the opposite direction to movement and always slows down a moving object. Friction is in all places where two surfaces meet, but its force depends on their materials. Normally smooth surfaces have less friction than rough surfaces. Friction can be a useful force.

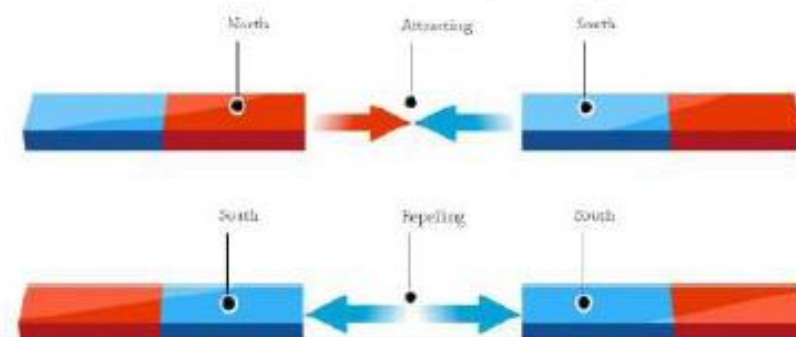


Bar Magnet

Horseshoe Magnet

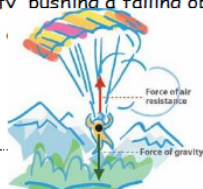
Disc Magnet

Magnets have north and south poles. These attract each other but two north or two south poles repel each other.



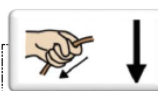
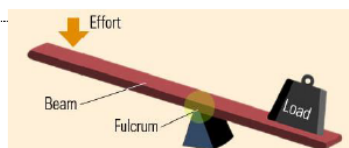
Air resistance

Air resistance is a type of friction between air and another material. Air resistance acts in the opposite direction to gravity pushing a falling object upwards.



Lever

Levers are simple machines that are helpful in everyday life. They can help us to lift heavy loads with less effort. Levers have four main parts.



Gravity

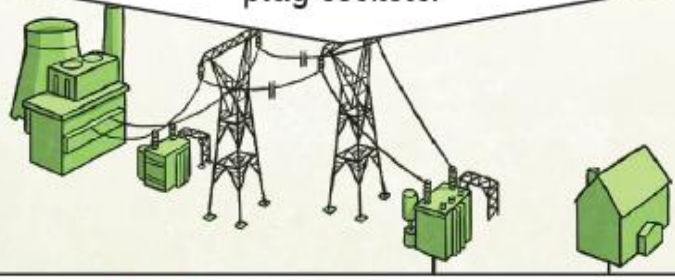
Gravity is a non-contact force. It pulls objects towards each other. Anything with a mass can pull on another object. The bigger the object's mass, the bigger the gravitational pull.

	Term	Definition
1	Force	A push or pull on an object which can cause it to move, change speed, direction or shape. Measured in Newtons (N).
2	Magnet	A material or object that produces a magnetic field. It attracts or repels magnetic objects, including iron.
3	Contact force	A force that requires physical contact to occur e.g. kicking a ball.
4	Attract	To pull towards. Opposite of repel.
5	Repel	To push away. Opposite of attract.
6	Propel	The act of driving or pushing forward.
7	Friction	The resistance of motion when one object rubs against another. Friction causes objects to slow down and the energy becomes heat.
8	Weight	The force due to gravity on objects. This force pulls on all objects near the earth. Measured in Newtons (N).
9	Mass	The amount of matter contained in an object. Measured in units such as g, kg.
11	Gravity	The area around a large object when a weight can be felt. The sun's gravity keeps the planets orbiting around it.
12	Air resistance	The frictional force of air against a moving object. The faster an object moves, the greater the air resistance.
13	Water resistance	The frictional force of water against a moving object. The faster an object moves, the greater the water resistance.
14	Acceleration	Increase in the rate or speed of something.
15	Balanced force	Two forces of equal size acting in opposite directions on an object so that it will stay still or continue to move in the same way.
16	Unbalanced force	Two forces of unequal size acting in opposite directions causing an object to move, change speed, direction or shape.

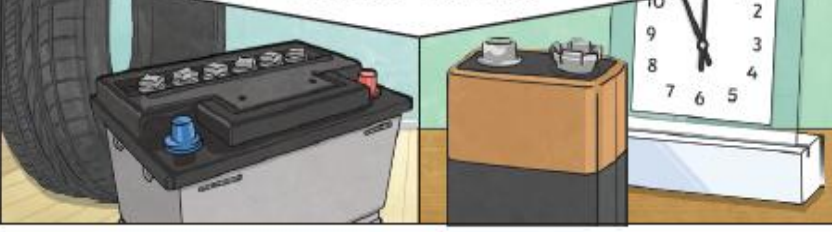
Key Vocabulary	
circuit	A pathway that electricity can flow around. It includes wires and a power supply and may include bulbs, switches or buzzers.
electrons	Small particles with an electric charge.

There are two types of electric current.

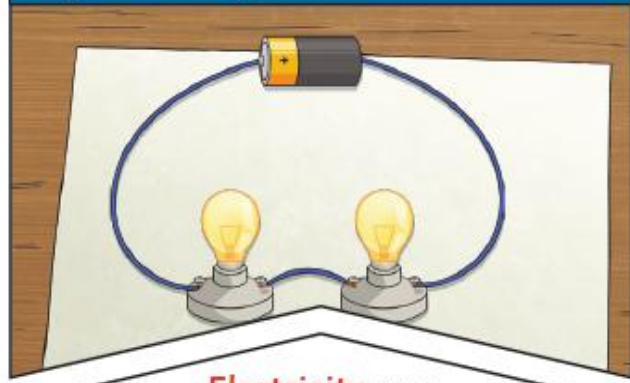
Mains electricity: power stations send an electric charge through wires to transformers and pylons. Then, underground wires carry the electricity into our homes via wires in the walls and out through plug sockets.



Battery electricity: **batteries** store chemicals which produce an electric current. Eventually, even rechargeable **batteries** will stop producing an electric current.



Key Knowledge



Electricity can only flow around a complete **circuit** that has no gaps. There must be wires connected to both the positive and negative end of the power supply/**battery**.

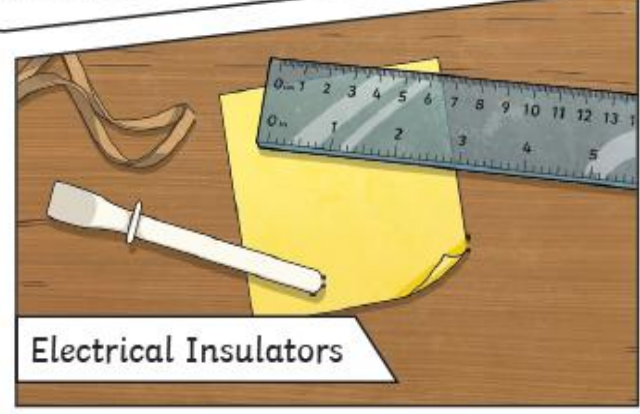
Switches can be used to open or close the **circuit**. When off, a switch 'breaks' the **circuit** to stop the flow of **electrons**. When the switch is on, the **circuit** is complete and the **electrons** are able to flow around the **circuit**.



A conductor of **electricity** is a material that is made up of free **electrons** which can be made to move in one direction, creating an electric current. Metals are good conductors. Electrical insulators have no free **electrons** and so no electric current can be made. Wood, plastic and glass are good insulators.



Electrical Conductors



Electrical Insulators