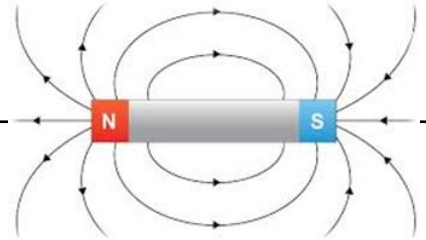
Year 9 Physics: Magnetism Knowledge Organiser

End Point A: Bar magnets

The poles of a magnet are where the magnetic forces are the strongest. When magnets are brought together they exert a force on each other: **like poles repel**, **opposites attract**. Attraction and repulsion are examples of non-contact forces.
The region around a magnet where a force acts on another magnet or a magnetic material is called the magnetic field. The force between a magnetic material and a magnet is always of attraction. The force is greater the nearer it is to the magnet and is strongest nearest to the poles. The direction of a magnetic field line is always from the north (seeking) pole to the south seeking pole.



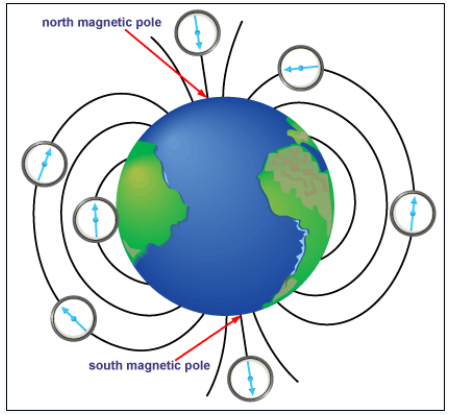
End Point C: Permanent and Induced Magnets

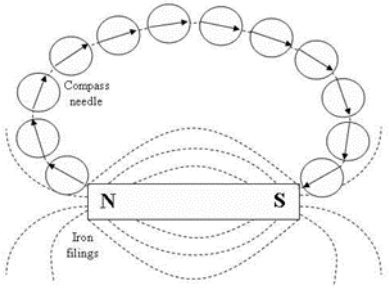
A permanent magnet makes its own magnetic field whereas an induced magnet is a material that only becomes magnetic when placed in a magnetic field. Induced magnetism always causes a force of attraction. Induced magnets lose their magnetism when taken out of a magnetic field.

End Point B: Earth's Magnetic Field

The Earth has a magnetic field produced by convection currents in the Earth's core which is made of iron and nickel. When a plotting compass is placed in the Earth's magnetic field, the north pole of the compass will line up with the Earth's magnetic field lines and point to magnetic south

A magnetic compass contains a small bar magnet. The compass needle points in the direction of the Earth's magnetic field. You can use a compass to plot the magnetic field pattern of a magnet.





End Points D & E: Electromagnetism

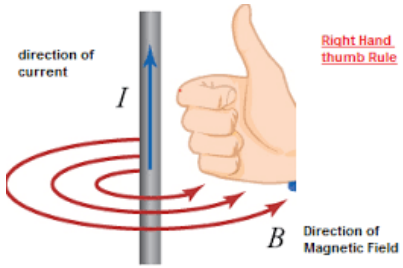
When a current flows through a wire it creates a magnetic field. You can work out the direction of the magnetic field using RIGHT HAND THUMB RULE.

You can increase the strength of the magnetic field a wire produces making turns in the wire in to a coil called a SOLENOID.

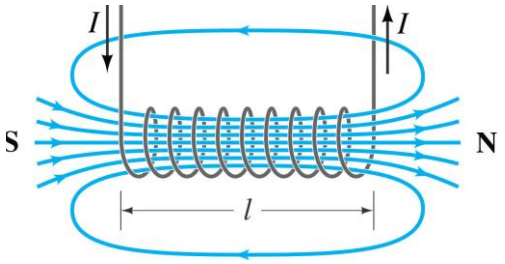
You can increase the strength of the magnetic field in a solenoid by 1. making more turns in the coil 2. increasing the current through the wire 3. adding an iron core through the middle. A solenoid with an iron core is an ELECTROMAGNET.

Electromagnets are INDUCED and can be turned on and off. Uses include scrapyards, motors, loudspeakers

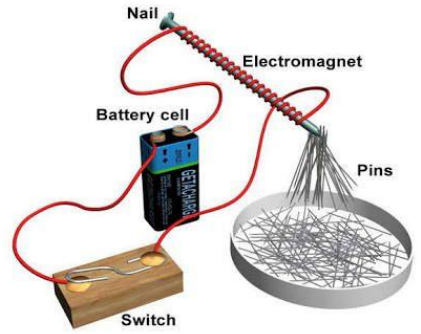
Right Hand Thumb Rule



Solenoid



Making an electromagnet



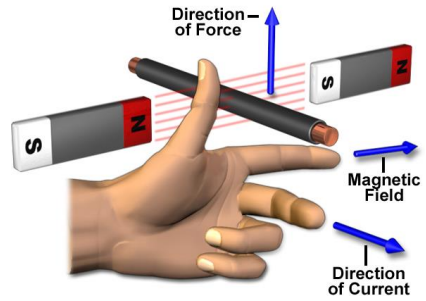
End Point I-L: Electric Motors

When a current carrying wire is placed in between magnetic poles, the magnetic field around the wire interacts with he magnetic field it is placed in which results in a FORCE called the motor effect and this makes the wire move.

The direction of the force is worked out using FLEMING'S LEFT HAND RULE. . The **F**irst finger represents the **F**ield direction, the se**C**ond finger represents the direction of the **C**urrent and the thu**M**b represents the **M**otion.

This motor effect is used when making electric motors; Because the coil is on a spindle the forces act one up and one down making the coil rotate.

Left Hand Rule



Simple Electric Motor