

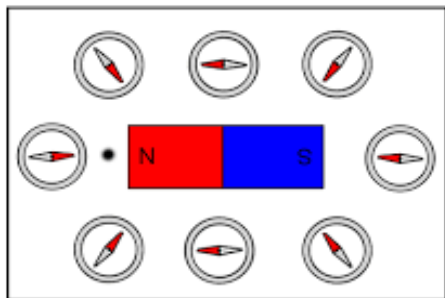
# Y9 - Magnetism

## Magnetic fields

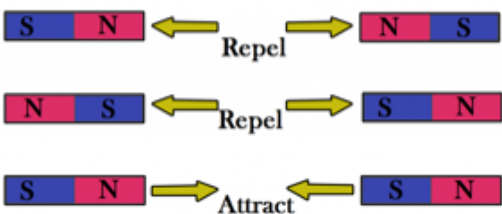
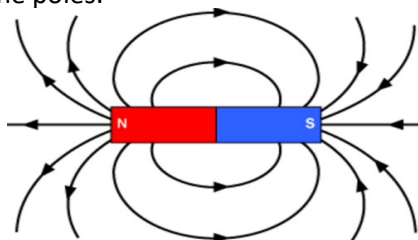
Magnets have a magnetic field around them.

Magnets can attract objects made of magnetic materials. The magnetic materials are iron, nickel and cobalt.

The direction of a magnetic field always points from the north pole to the south pole.

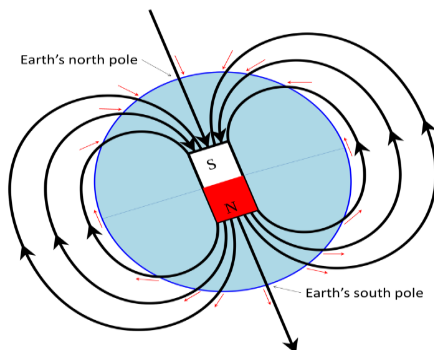


The magnetic field is strongest close to the poles.



## Earth's magnetic Field

The Earth's magnetic field causes the north side of a compass needle to point to 'magnetic north' (it is 'north seeking')



## Permanent and Induced Magnets

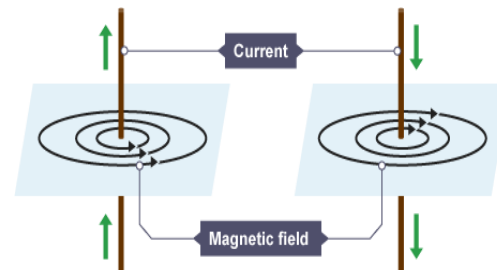
**A Permanent magnet** produces its own magnetic field. Example – bar magnet.

**An induced magnet** is a material that becomes a magnet when it is placed in a magnetic field. Example – Paperclips become induced magnets when they are attached to a magnet.



## Electromagnets

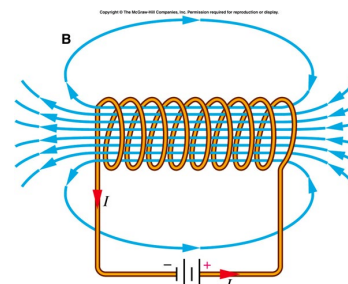
A wire with an electric current flowing through it has a magnetic field around it. The strength of the field increases if the current increases. The direction of the field changes if the direction of the current changes.



When a wire is wrapped into a coil, the magnetic field is in a similar shape to the magnetic field of a bar magnet.

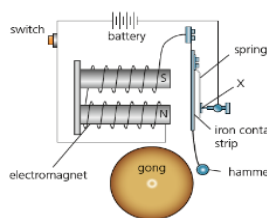
You can increase the strength of an electromagnet by:

- increasing the number of coils of wire,
- increasing the current in the wire,
- using a magnetic material as a core inside the coil of wire



## Use of electromagnets

### Door bells



## Electric motors

if a wire carrying a current is placed in a magnetic field it experiences a force.

