

FUN WITH MAGNETS



Magnets

- ☞ The substances having the property of attracting magnetic materials like iron.
- ☞ The force that pushes magnets apart or pulls them together is called magnetic force.

☞ Natural Magnets

Natural occurring minerals or ores having magnetic properties are called 'natural magnets'. Due to their irregular shapes and weak attracting power, natural magnets are rarely used now a days.

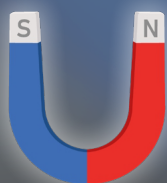
Types Of Magnets

☞ Artificial Magnets

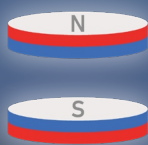
Now a days pieces of iron and many other materials of suitable shapes and sizes are made as magnets. Such magnets are called artificial magnets



Cylindrical magnet



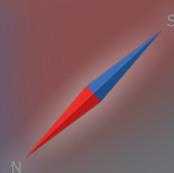
U-shaped magnet



Disc magnet



Bar magnet



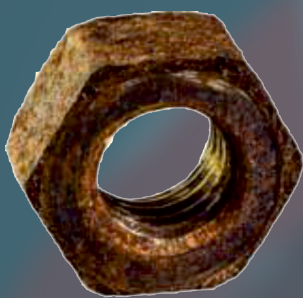
Needle magnet



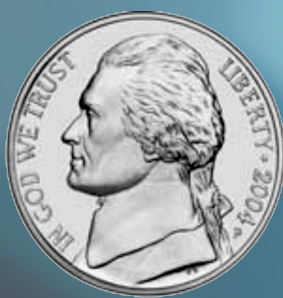
Ring magnet

Magnetic and non-magnetic materials

C The materials which get attracted towards a magnet are called magnetic materials. Iron, nickel and cobalt are magnetic in nature.

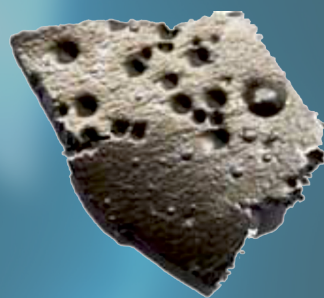


Iron



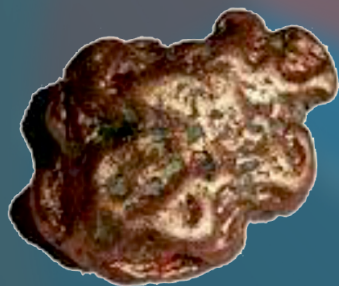
Nickel

Magnetic materials



Cobalt

C The materials which do not get attracted towards a magnet are called non-magnetic materials. Most of the materials we use in our daily life are non-magnetic in nature.



None Magnetic materials

Magnetic poles:

C The parts of a magnet where the magnetic force is strongest are called the magnetic poles. All known magnets have two poles, a north pole and a south pole.



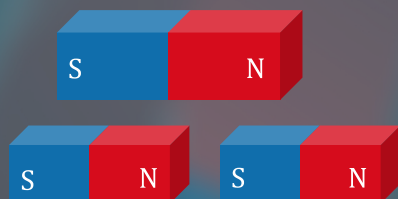
Properties of a magnet

Attractive nature



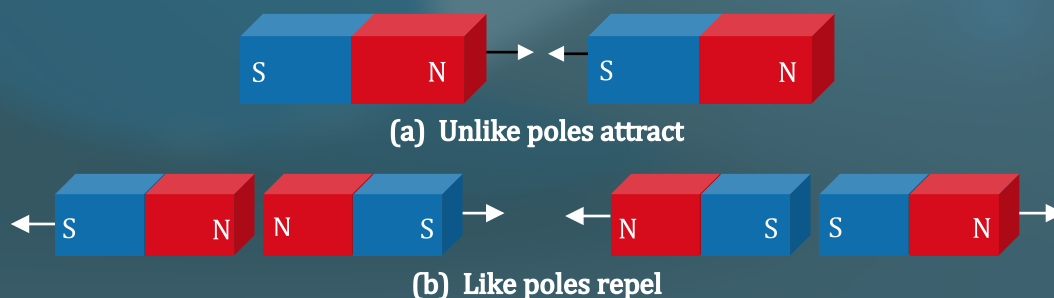
- A magnet has maximum attracting power at poles and minimum at center

Poles exist in pairs



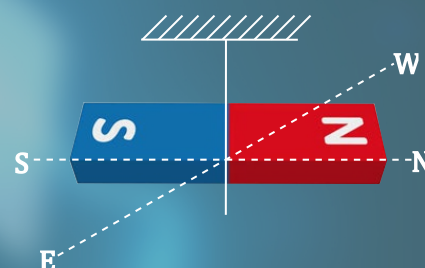
- A magnet always have two poles north and south pole

Forces between the poles of two magnets



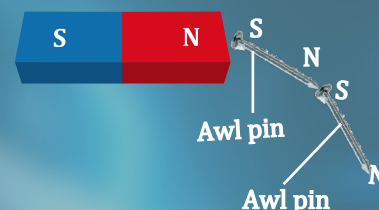
Forces between the poles of two magnets

Directive property



- A freely suspended bar magnet always point s towards north and south direction

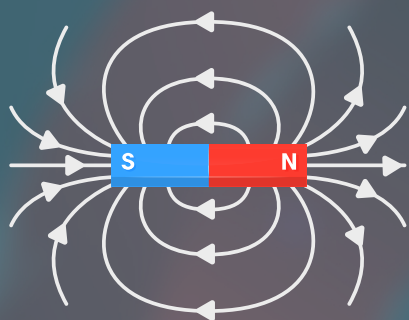
Inductive nature



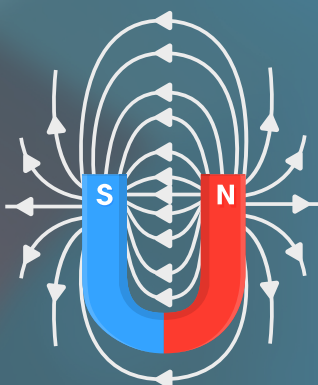
- when magnetic material comes in contact with magnet, it also get attractive property of magnet

Magnetic field

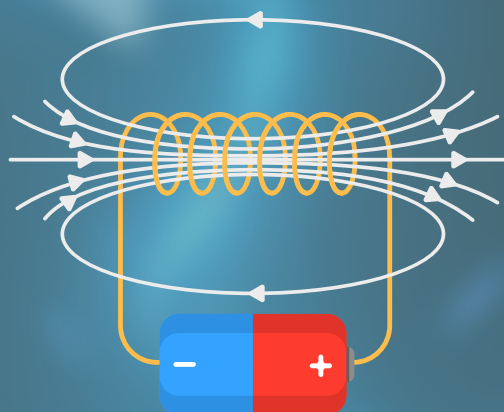
A region of influence surrounding a magnet, in which other magnets or materials like iron are affected by magnetic forces is called 'magnetic field'.



BAR MAGNET



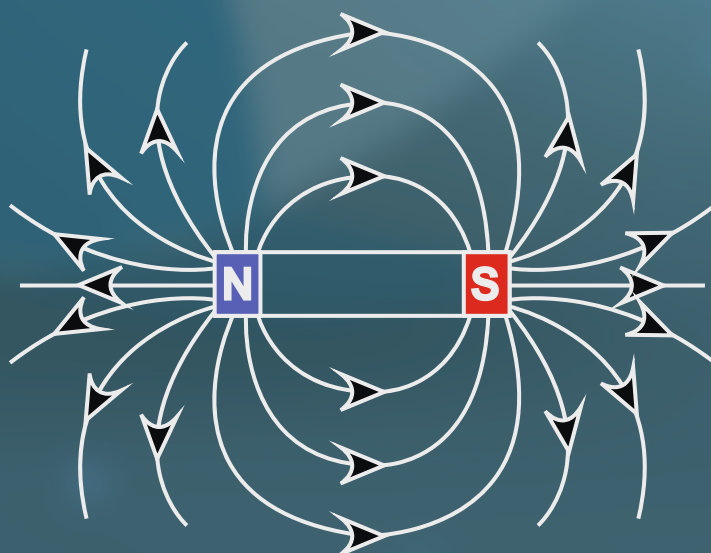
HORSESHOE MAGNET



ELECTROMAGENETIC FIELD

c: Magnetic field lines

Magnetic field lines represent the magnetic field of a magnet. These lines describe the direction of the magnetic force.



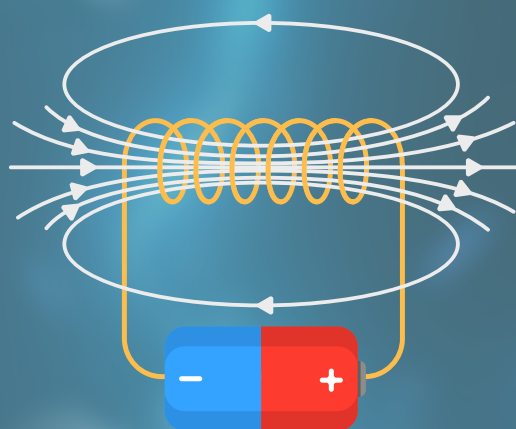
Magnetic compass needle or compass

It is an instrument that uses Earth's magnetic field to help people find directions.

- ❏ A compass needle is actually a thin magnet. The needle points in north direction because it aligns in the direction Earth's magnetic field.

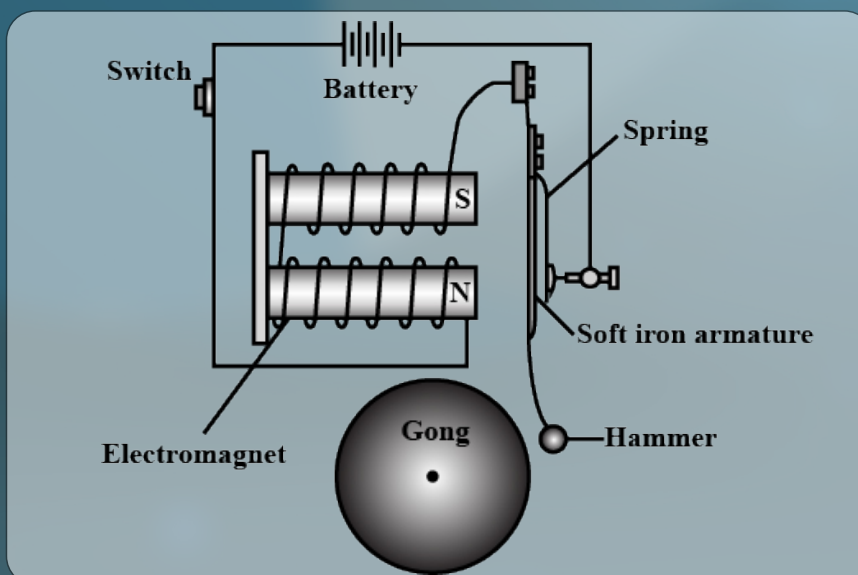
Electromagnets

An electromagnet is a coil of wire wrapped around a soft iron core. When an electric current flows through the coil, it creates a magnetic field.



Electric bell

Electric bell is based on the principle of an electromagnet, "a temporary strong magnet acquires magnetic properties when an electric current flows through it, and loses its magnetic properties as soon as the current is stopped".



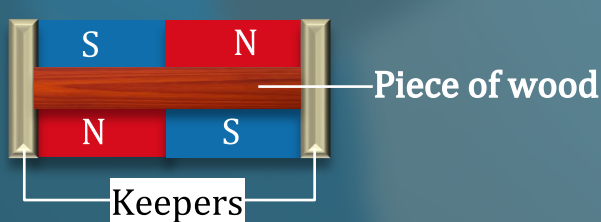
Electric bell

Uses of magnets and electromagnets

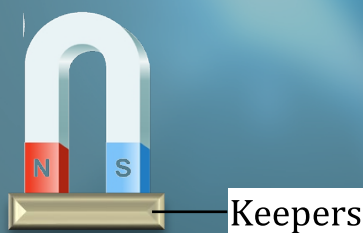
- They are used in radio and stereo speakers.
- They are used in almirah and refrigerator doors to keep them in closed position.
- They are used on video and audio cassette tapes.
- They are used on the hard discs and floppies for computers.
- They are used in different children's toys.

Safety measures for magnets

- Magnets should not be heated at high temperatures, repeatedly hammered or dropped from some height. This is because by doing so, they lose their magnetism.
- Magnets become weak if they are not stored properly. Magnets tend to become weaker after some time if their poles are left free. This is called self demagnetisation. To avoid this, bar magnets are kept in pairs separated by a piece of wood, with unlike poles on the same side. Pieces of iron, called magnetic keepers or simply keepers, are placed across both ends. A horseshoe magnet needs only one keeper across its poles.



(a) Bar magnets



(b) Horseshoe magnet

Keeping magnets safely