Class 6 Physics Fun with Magnets

Magnets

Magnets

A Magnet is a material or objects that has a property of attraction or pull force for ferromagnetic materials like iron, cobalt, nickel etc.

- Magnets attract Ferromagnetic materials like Iron towards it.
- Magnets also attract and repel other magnets.
- Applications of attraction property of magnets in day to day life are – Refrigerator doors, pencil boxes or purses with magnetic closure buttons, iron separator from waste etc.

Iron nails getting attracted towards a horse shoe magnet.

Refrigerator doors have magnets on the edge so that they can close automatically.

Purse having magnetic button closes the purse without any locking arrangement.

Class 6 Physics Fun with Magnets — Magnets Discovery Types and Poles

Magnets – Discovery, Types & Poles

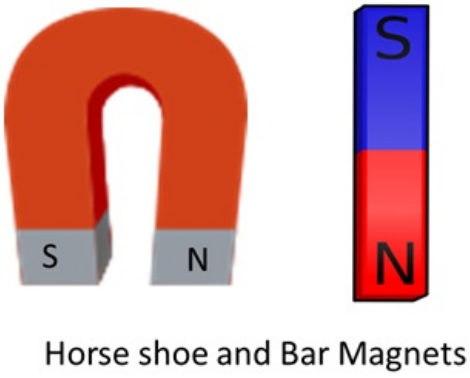
- Magnets are said to be discovered by a shepherd named Magnes of ancient Greece.
- Magnes had an iron-end stick which got attracted by a rock on a hill.
- This rockwas made of **Magnetite**which contains iron.

There are two types of magnets:

- **Natural Magnets** are made up of magnetite and are found in nature.
- **Artificial magnets** are prepared using various processes and with the help of iron.Examples of artificial magnets include bar, horse shoe, cylindrical, ball-end magnet etc.

A magnet has most magnetism at the two ends of it. These ends are called **Poles**.

- As a convention, these ends are usually referred to as**South (S)**and **North (N)**
- In a freely suspended magnet, the end of the magnet that points towards North is called its **North seeking end or North Pole**.The other end of the magnet that points towards South is called its **South seeking end or South Pole**

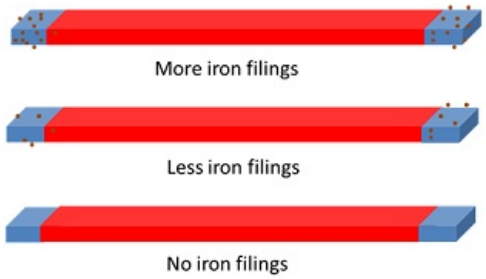


Horse shoe and Bar Magnets

Class 6 Physics Fun with Magnets Magnetic and Non Magnetic Materials

Magnetic and Non-Magnetic Materials

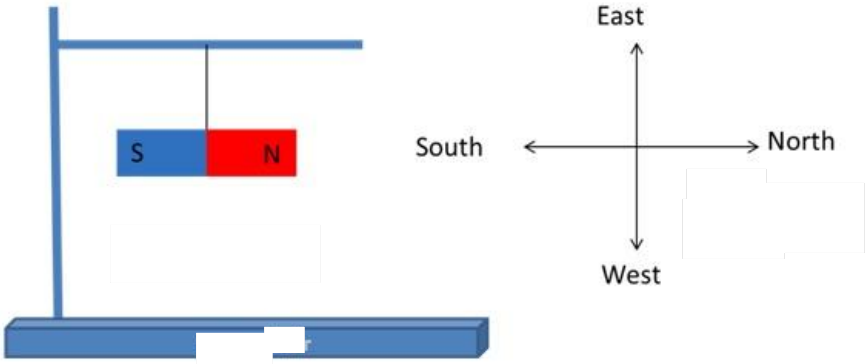
- Materials which get attracted towards magnet are called **Magnetic materials**. Examples are iron, nickel, cobalt.
- Materials which do not get attracted towards magnet are called **Non-Magnetic materials**. Examples are paper, wood, plastic etc.



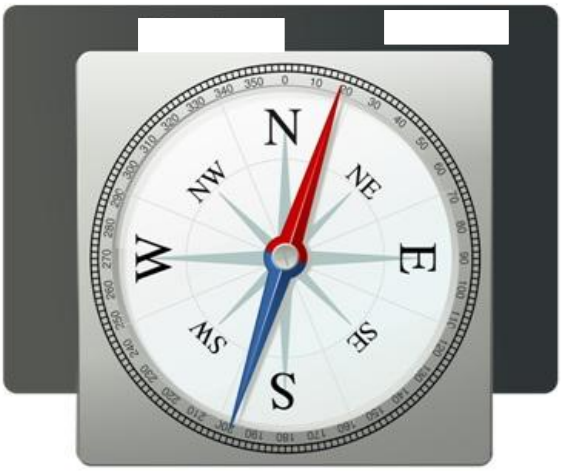
Bar Magnet rubbed in soil experiment. Soil containing iron particles/filings sticks to the magnet and rest of the soil falls down. Higher the amount of soil sticking to the magnet, higher the iron content in the soil.

Finding directions using Magnet

- A freely suspended magnet always comes to rest in **North-South direction**. This property has been used from olden days to find directions.
- **Compass** is a device used to find directions.
- Compass consists of a magnetized needle and a dial, marked with directions, inside a box with glass cover. The freely rotating needle comes to rest in north-south direction as depicted on the dial. The north pole of the needle is marked red for distinguishing it from south pole.



A freely suspended magnet, always comes to rest in North-South direction.



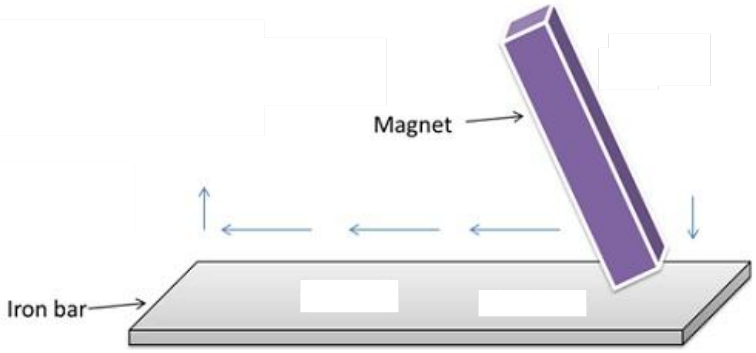
A Compass. North pole of the needle is marked as red.

Class 6 Physics Fun with Magnets

Making own Magnet

Making own Magnet

- Take an Iron bar and a Magnet bar.
- Place one of the magnet's pole at the edge of the iron bar.
- Slide the magnet towards the other edge of the iron bar without lifting the magnet.
- Lift the magnet now and place at the initial position again with same pole touching iron bar.
- Repeat this process 30-40 times or more till the iron bar becomes magnetized.



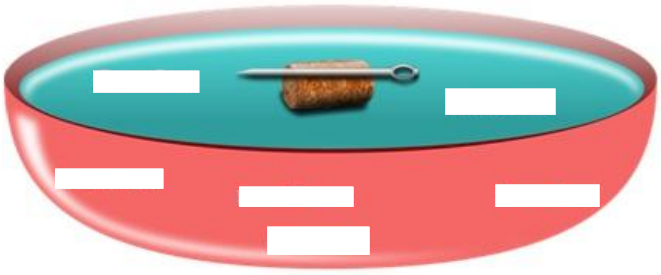
Process of making an Iron bar as a magnet temporarily.

Class 6 Physics Fun with Magnets

Making own Compass

Making own Compass

- Take a cork, a magnetized needle (using above process) and a bowl of water.
- Glue the needle to the cork and set the cork in bowl. Needle should not touch water.
- Even after rotating the cork a few times in any direction, the needle will make the cork move so that it points in North-South direction.



A home-made compass

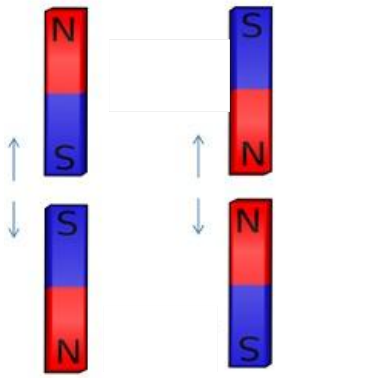
Class 6 Physics Fun with Magnets

Attraction and Repulsion

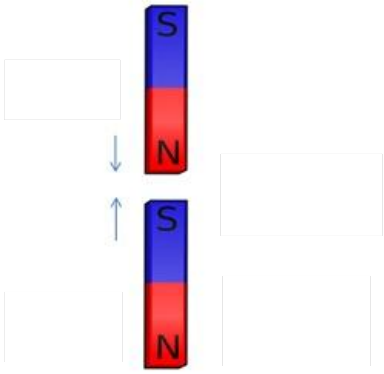
Attraction and Repulsion

Magnets attract iron but can attract and repel another magnet.

- **Like or same poles** of two magnets when brought closer, they **repel** each other. Example, south pole of one magnet repels south pole of other. Similarly, north pole of one magnet repels north pole of the other.
- **Unlike or different poles** of two magnets when brought closer, they **attract** each other. Example, south pole of one magnet attracts north pole of other.



Repulsion between similar poles



Attraction between dissimilar poles

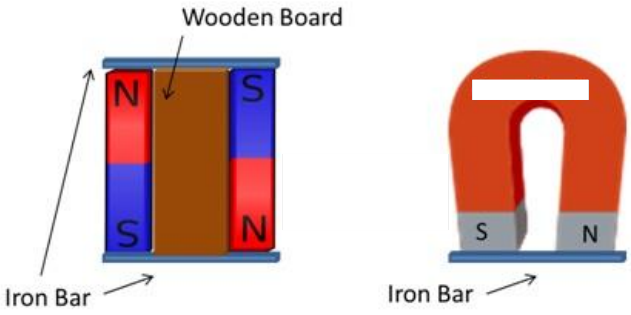
Precautions with Magnets

Below are a certain conditions where a magnet may get damaged:

- Magnets lose magnetism when they are heated, hammered or dropped from some height.
- Magnets become weak if they are not stored properly.

Magnets should be stored as mentioned below:

- Magnets should be kept in pairs with their unlike poles on the same side. They must be separated by a piece of wood while two pieces of soft iron should be placed across their ends.
- For horse-shoe magnet, one should keep a piece of iron across the poles.



Methods to store Magnets

Magnets also have adverse effects on equipment. Precautions to be taken are:

- Keep magnets away from cassettes, mobiles, television, music system, compact disks (CDs) and the computer.