Chapter-6

MAGNETISM

A magnet is a substance that has the capability of attracting the substances like iron, nickel and cobalt.

The property of attracting other substances such as iron, nickel and cobalt of a magnet is called magnetism.

The force produced by the magnet to attract the other substances is called magnetic force.

DISCOVERY OF MAGNETS

Some people said a natural magnet was discovered by Greeks called magnetite.

An ancient tale of Greek divulged that a shepherd boy named “Magnes” discovered the magnet when he was roaming nearby a mountain carrying a wooden stick having metal cap at the bottom stuck to the black rock, which was named after him “Magnetite”.

Nowadays, magnets are used to make televisions, telephones, mobile devices and washing machines, etc.

Magnetic and Non-Magnetic Substances

Magnetic Substances	Non-Magnetic Substances
These substances that are attracted towards the magnet.	These substances do not attract towards the magnet.
Iron, nickel and cobalt are the	Copper, brass and wood are the examples of non-magnetic

examples of magnetic substances.	substances.

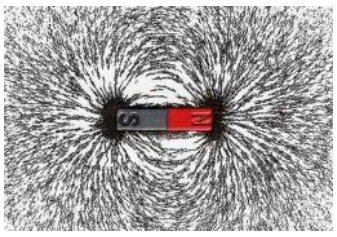
NATURAL AND ARTIFICIAL MAGNETS

Natural Magnets	Artificial Magnets
The magnets are created by the nature are called natural magnets	The magnets that are created by man are called artificial magnets
A certain types of rocks such as magnetite are the examples of natural magnets.	Bar magnets, horseshoe magnets and cylindrical magnets are the examples of artificial magnets.
They are present in irregular shapes.	They are constructed in different shapes and sizes.
They are made up of rocks.	They are made up of iron, cobalt and nickel.

Properties of Magnets

1. **Attractive property-**

The property of a magnet attracting the magnetic substances towards itself even if they are placed between the non-magnetic substance . Such property of a magnet is known as the attractive property. For example, a magnet can attract an iron hook that is placed under the wooden table corner.



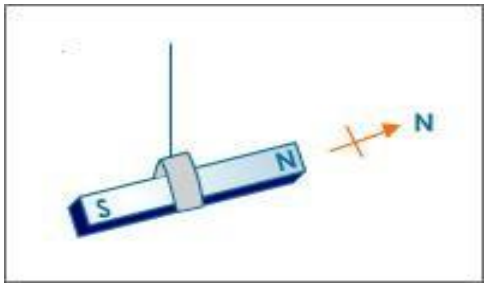
Poles of a Magnet

- The two ends of a magnet are known as magnet poles.
- The force of the magnet is at the maximum level at the magnetic poles.
- The force of a magnet is minimum in the middle.
- These magnetic poles of every magnet are called the North Pole and the South Pole
- The North Pole of every magnet faces the earth's geographical North Pole, while its South Pole faces the earth's geographical South Pole.
-

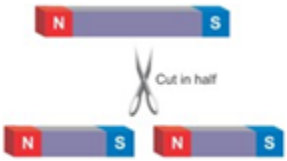
2. The Directive Property

If we freely suspend a bar magnet then its poles is always aligned in the geographical north-south directions.
Due to this property, people started using a magnet as a directional tool and called it lodestone (leading stone).

Magnetic axis: The two poles of a magnet adjoined at an imaginary line called a magnetic axis. The axis of a magnet is always aligned in the north-south directions when the magnet is freely suspended.
Magnetic compass: A device that was invented to find the directions by the sailors, pirates and boat travelers composed of the magnetic needle with two-point ends suspended on a pivot where it is free to rotate

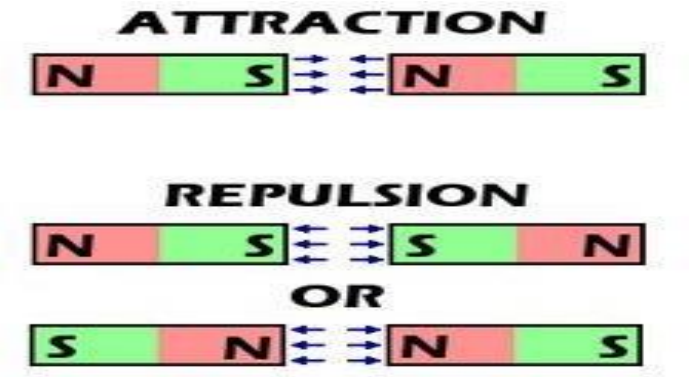


3. **Poles exist in pairs (No Monopoles exist)**



North Pole and South Pole cannot exist separately.

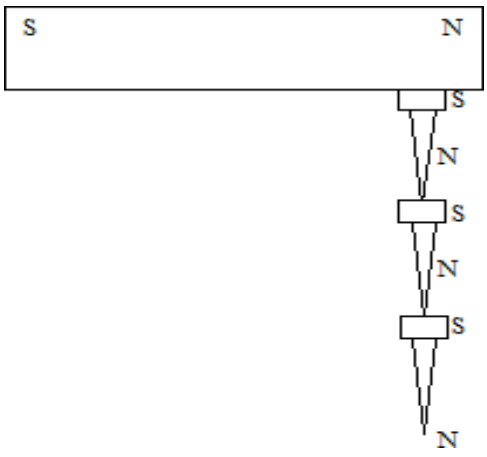
4. **Like poles repel and Unlike poles repel each other**



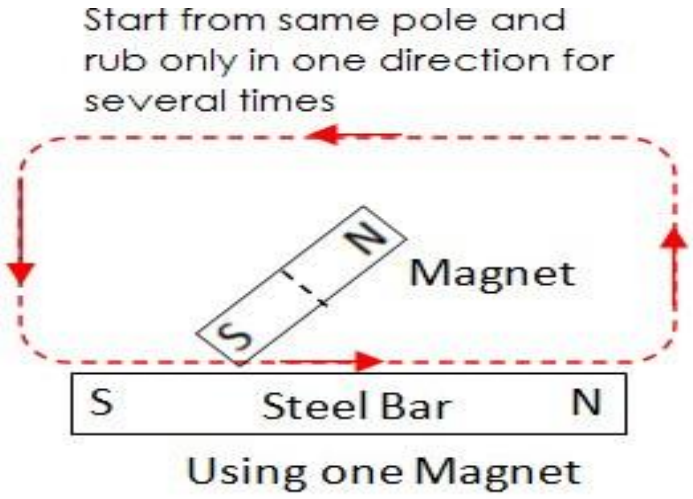
REPULSION IS A SURE TEST FOR MAGNET

MAKING MAGNETS

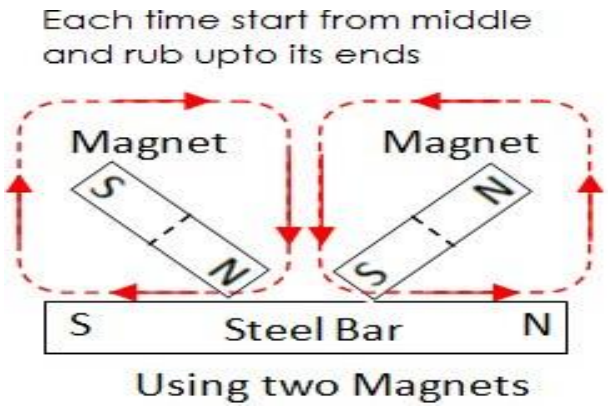
1. **Magnetic Induction**: - Magnetism acquired by a magnetic material when it is kept near or in contact with a magnet.



2. Single touch method-

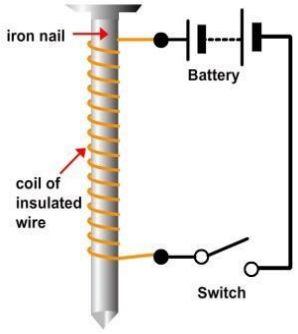


3. Double Touch method:



4. **Electrical method**

Electromagnet-



It is a temporary strong magnet made from a piece of soft iron when current flows in the coil wound around it. It is an artificial magnet. The polarity and magnetic field strength can be changed. Demagnetized by switching off the current.

Strength depends on:

- Number of turns in coil
- Amount of current flowing

Uses: lifting and transporting huge mass of iron scrap, loading furnaces with iron, electric bell, electric fans, electric motors etc.

Advantages of electromagnet

Can be easily magnetized and demagnetized by turning the current on or off in the coil.

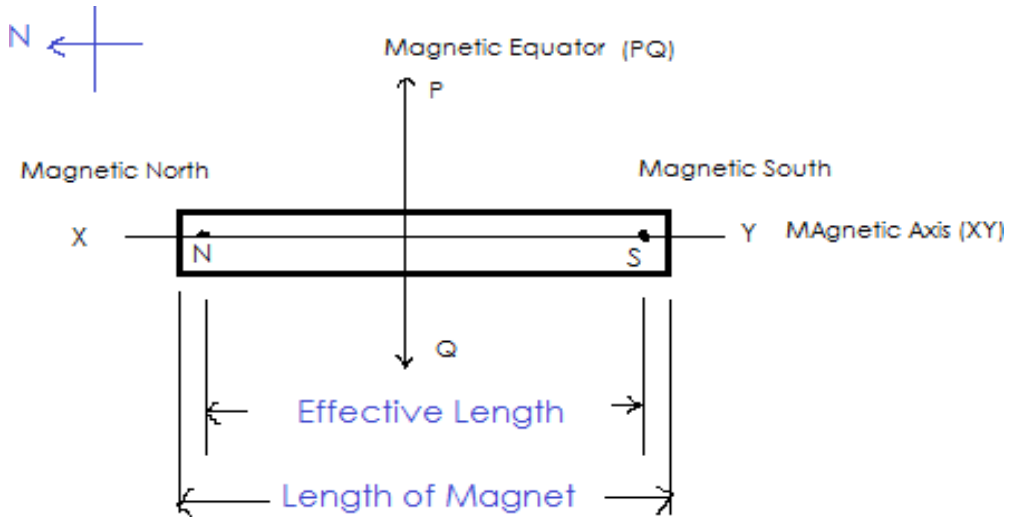
They can be made stronger than any other permanent magnet.

Poles of an electromagnet can be interchanged by reversing the direction of current.

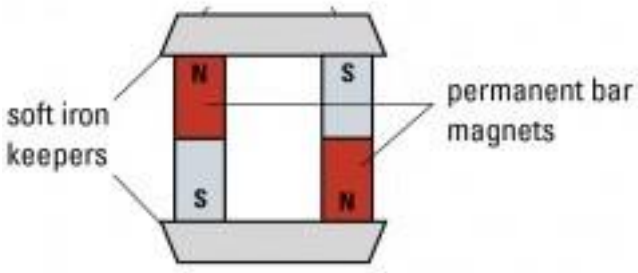
Demagnetizing a Magnet

- By hammering the magnet repeatedly
- By rough handling
- By heating and keeping in east west direction
- By passing AC current
- Self-demagnetization.

Parts of bar magnet



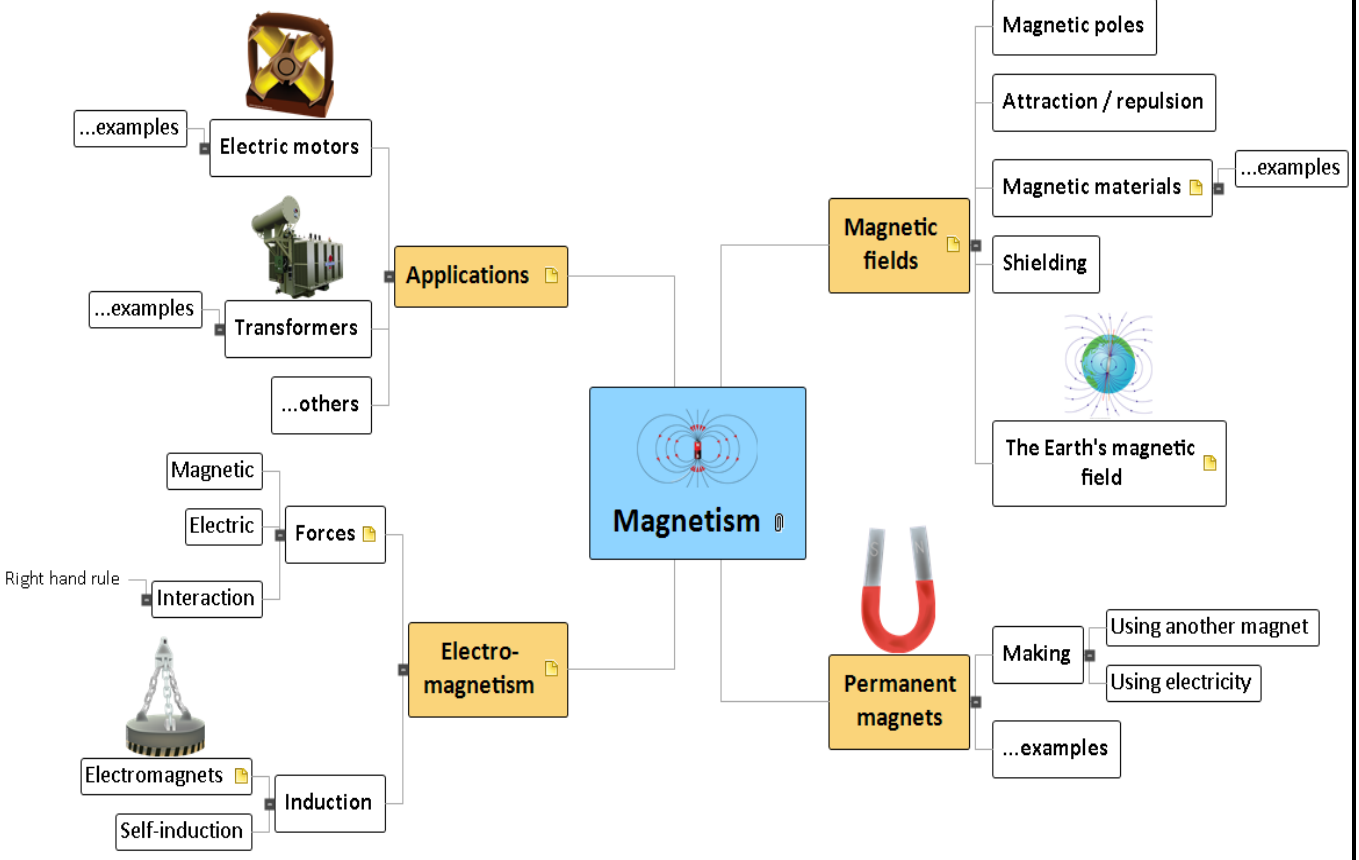
Storing of Magnets - Magnet keepers



Uses of Magnet

- Magnetic compass
- Door bells
- Dynamos
- Motors
- Loudspeaker , etc.,

CONCEPT MAP-


Magnetism
Applications
Electric motors
...examples
Transformers
...examples
...others
Electro-magnetism
Forces
Magnetic
Electric
Interaction
Right hand rule
Induction
Electromagnets
Self-induction
Magnetic fields
Magnetic poles
Attraction / repulsion
Magnetic materials
...examples
Shielding
The Earth's magnetic field
Permanent magnets
Making
Using another magnet
Using electricity
...examples