

# MAGNETISM - Form 2 Physics Notes

- [Properties of Magnets](#)
- [Magnetic Field Patterns](#)
  - [Direction of Magnetic Field](#)
  - [Characteristics/Properties of Magnetic Field Lines](#)
  - [Practical Application of Magnetic Shielding](#)
- [The Domain Theory of Magnetism](#)
- [Magnetization](#)
  - [Electrical Method](#)
  - [Hammering \(Mechanical Method\)](#)
  - [Induction](#)
  - [Stroking Method](#)
- [Demagnetization](#)
  - [Hammering in East-West Direction](#)
  - [Heating](#)
  - [Electrical Method](#)
- [Hard and Soft Magnetic Material](#)
  - [Soft Magnetic Material](#)
  - [Hard Magnetic Materials](#)
- [Storing Magnets](#)
- [Uses of Magnets](#)
- [Revision Questions](#)

## [Properties of Magnets](#)

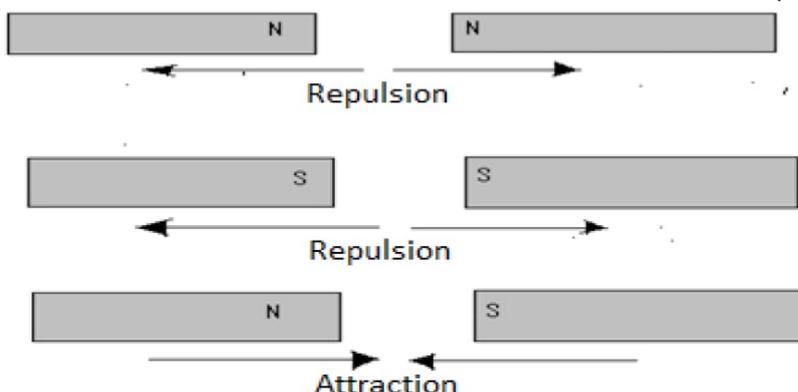
### 1. Magnetic poles

- Magnetic poles refer to the ends of a magnet where the power of attraction or repulsion is greatest.
- The force of attraction of a magnet is greatest at its poles. The force reduces away from poles. This is why when a bar magnet is dipped in iron fillings, the fillings cling mainly around the ends of the magnet.



### 2. Directional property of a magnet

- If a magnet is suspended by a thread and is free to rotate it rotates and finally rests in the North-South direction. This is called the directional property of a magnet.



- Repulsion is the only sure test for polarity of magnet. This is because repulsion can only occur between like poles of magnets. Attraction is not sure test because it can occur between unlike poles of magnets or between a magnet and unmagnetized magnetic material.
3. Magnetic and non-magnetic materials
    - **Magnetic materials** are those that can be attracted by magnets e.g. Iron, Nickel, Cobalt, Iron alloy like steel, Nickel alloy etc.
    - **Non-magnetic materials** are those that cannot be attracted by a magnet e.g. Copper, Brass, Aluminium, Glass, wood, Graphite
    - **Ferromagnetic materials** are magnetic materials that are strongly attracted by magnet e.g. soft iron
  4. The Basic Law of Magnetism
    - It states that like poles of magnets repel while unlike poles attract.

### Exercise

1. Describe how you would verify the basic law of magnetism given two bar magnets and a piece of thread.

#### **Solution**

#### **Procedure**

Suspend one bar magnet. Bring the north pole of another magnet towards the north pole of the suspended magnet and observe what happens.

Bring the same pole towards the south pole of the suspended magnet.

#### **Observations and conclusion**

A north pole attracts a south pole and repels a north pole while a south pole repels a south pole. Hence, like poles repel while unlike poles attract.

## Magnetic Field Patterns

### **Magnetic Field**

- The space around a magnet where the magnetic influence(magnetic force of attraction and repulsion) is felt.
- The field is stronger near the poles of the magnet and is weaker farther away from the poles.

### **Magnetic Field Lines**

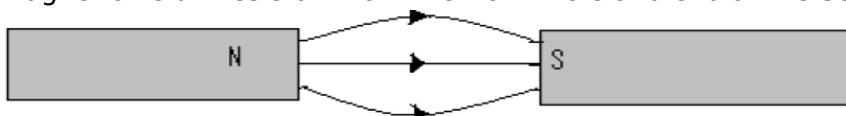
- These are lines of force which represent a magnetic field. These lines form a magnetic field patterns.

### Direction of Magnetic Field

- The direction of magnetic field at a point is the direction to which a free north pole would move if placed at that point in the field.

### Characteristics/Properties of Magnetic Field Lines

- a. Magnetic field lines start from the North Pole and end at the South Pole.



- b. They repel each other sideways and form closed paths as shown above.
- c. They do not intersect each other.