CHAPTER ELEVEN

MAGNETISM AND ELECTRICITY

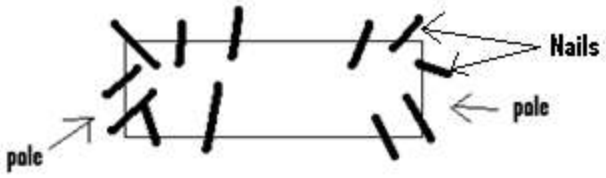
Magnetism: This is the name given to the forces which acts between magnets.

Uses or Importance of Magnets:

They are used in generators, radios, televisions, electric fans and telephones.

The Poles of a Magnet:

This refers to the two ends of a magnet, where the magnetic forces of attraction are strongest. If a bar magnet is placed into a container of nails, it will be seen that the ends or the poles will pick up more nails than any other portions or parts. This is due to the fact that the magnetism is strongest at these points.



A magnet has two types of poles and these are:

1) The north pole.
2) The south pole

How to determine the north and the south poles of a magnet:

If we have a bar magnet and we want to determine which of the two ends is the north pole, and which is the south pole, we go through the following steps;

1. Hang the bar magnet from a ceiling using a thread.
2. Push or hit the magnet so that it swings freely or move from side to side
3. After it stops swinging, one of its ends will point always in the north direction and this is the north pole.
4. The other end which always points in the south direction is the south pole.

Magnetic substances or materials:

These are materials which can be attracted by a magnet. Examples are iron and steel.

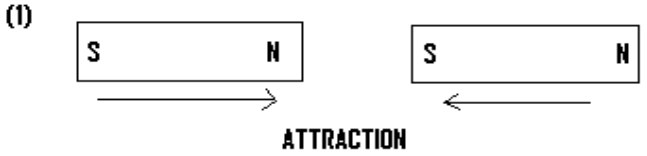
Non-magnetic substances or materials:

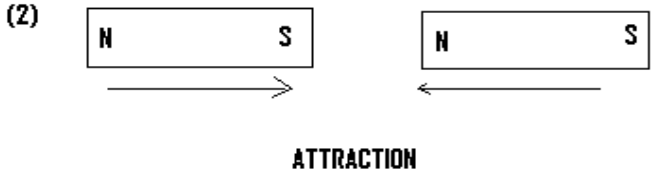
These are those materials which cannot be attracted by a magnet. Examples are wood and plastic.

Attraction and Repulsion in Magnets:

If two magnets are taken and the end of one of them is brought towards the end of the other one, the magnets may attract each other or repel, (i.e. push away) each other.

Attraction: It is known that attraction occurs if unlike or different poles (i.e. North and South poles), are brought towards each other.
Examples:





Repulsion: Repulsion occurs if two like or similar poles are brought toward each other.
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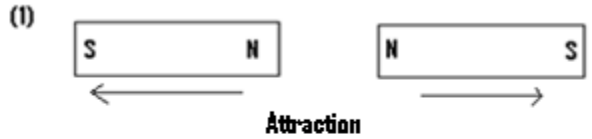
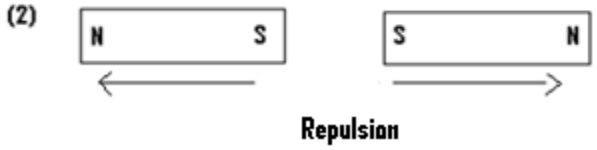




Types of Magnets:

There are two main types of magnets and these are;

1. Permanent magnet.
2. Electromagnet.

Permanent Magnet: This is made of a metal and always acts as a magnet. In permanent magnet, the magnetism is always available.

Electromagnet: This refers to a metal which only acts as a magnet, when current is flowing or passing through it. For example if a coil of metal wire is taken and current is passed through it, the wire will act as a magnet so long as the current flowS through it. But the wire will no

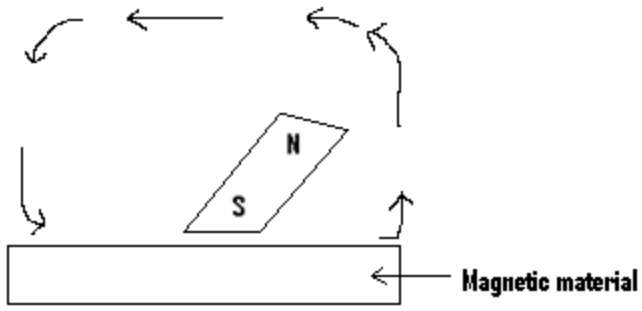
longer act as a magnet, when the current stops flowing through it. This type of magnetism which only occurs or arises when current is flowing through a metal, is called electromagnetism.

MAGNETIZATION:

This refers to the process of changing a magnetic material into a magnet. There are three methods and these are:

i. The stroking method.
ii. The electrical method.
iii. The induction method.

The Stroking Method:



In this method, the material to be changed into a magnet which must be a magnetic material , is placed on a table. One end or a pole of a magnet is used to stroke its surface several times, until it becomes a magnet.

The Electrical Method: In this method, we use a device or an instrument called a solenoid. The material to be changed into a magnet is first placed inside the solenoid. Current is then made to flow through the solenoid for a short time. After removing the magnetic material from the solenoid, we will be notice that it has become a magnet.

Magnetic Induction: In this method, the magnetic material to be changed into a magnet is attached to a permanent magnet for a long time. After removing it from the magnet, it will be noticed that it has also become a magnet.

DEMAGNETIZATION:

This is the process in which the magnetism or the magnetic power within a magnet is removed. The methods that can be used to demagnetize a magnet are:

1. The heating method.

2. The hammering method.

The Heating Method: In this method, the magnet is heated until it becomes very hot. It is then allowed to cool whilst one of its poles points to the east and the other points to the west. After cooling the magnet will no longer act as a magnet.