Chapter Fourteen

Magnetism and electricity

Magnetism:

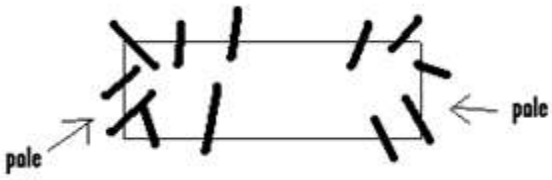
- This refers to the forces which operate or act between magnets.

Uses of magnets:

- Used in generators.
- Used in radio, T.V and the compass.
- Telephones, loud speakers, electric fans, electric motors contain magnets.

The poles of a magnet:

- These refer 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 portion or part.
- This is due to the fact that the magnetism is strongest at these points.



- There are 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 its 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. Allow it to swing freely until it settles.
3. One end will always point in the north direction, while the other end points to the south direction.
4. The end or the pole which points towards the north is the north pole, while the one which points towards the south 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:

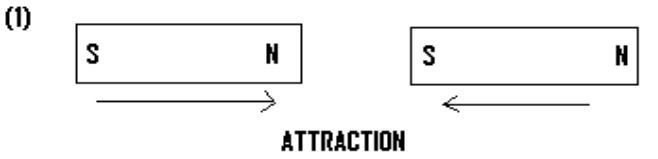
- These are materials which cannot be attracted by a magnet.
- Examples are wood, plastic and paper.

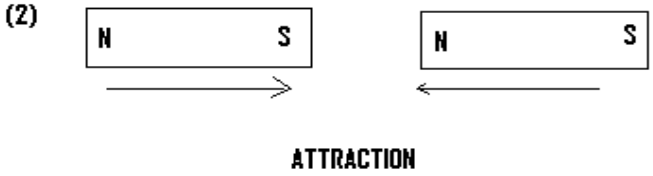
Attraction and repulsion in magnets:

- If two magnets are taken and the end of one is brought towards the end of the other, the magnets may attract or repel each other.

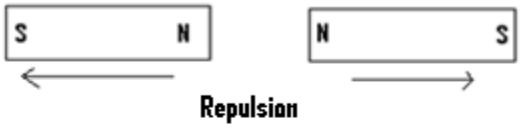
Attraction;

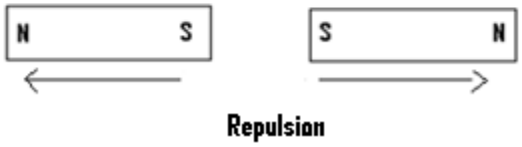
- It is known that attraction will occur if unlike or different poles (i.e. north and south poles) are brought towards each other.
- Example:





- Repulsion will occur always if two like or similar poles are bought toward each other.

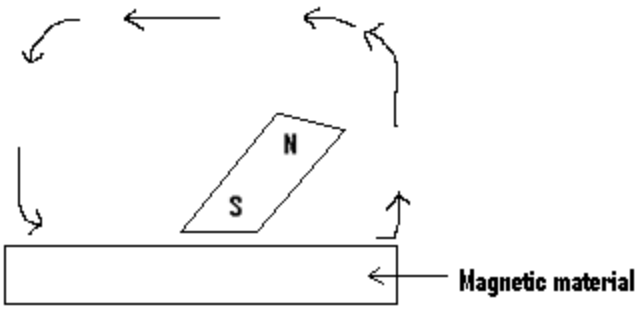




Magnetization (Making a magnet):

- Magnetization refers to the process of changing a magnetic material into a magnet.
- There are three methods of making a magnet and these are:
  (1) The stroking method.
  (2) Using electric current.
  (3) By induction.

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 the pole of a magnet (i.e. either the north or south the pole), is drawn or used to stroke the surface of the material several times, until it becomes a magnet.

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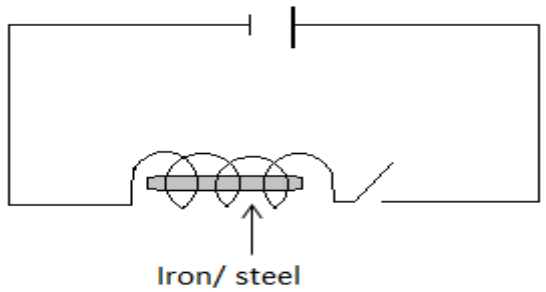
The Electrical Method:



- In this method of making a magnet, a solenoid is used.
- A solenoid is made by winding insulated copper wire round several times, so that current can pass through it.
- The magnetic material to be changed into the magnet, such as iron or steel is placed into the solenoid.
- Electric current is then made to flow through the coil of the copper wire (solenoid) for a short time.
- The steel or iron will be changed into a magnet.

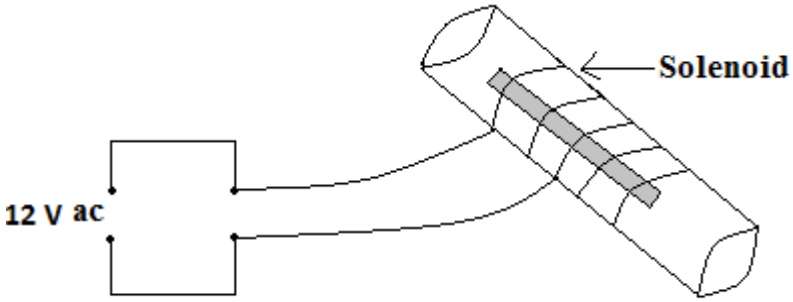
Magnetic induction:

- In this method, the material to be changed into a magnet is attached to a magnet for a long period of time, until it becomes a magnet.

Demagnetization:

- This is the process of making a magnet lose its magnetism.
- A magnet can be demagnetized, or made to lose its magnetism in the following ways:
  (1) By heating it.
  (2) By electrical method or by the use of the solenoid.
  (3) By hammering it.

Demagnetization through the electrical method:



- This is the best method of demagnetizing a magnet.
- The magnet is placed inside a solenoid through which a 12V a.c (i.e. a 12V alternating current) is flowing.
- While the current is still flowing, the magnet is withdrawn in an east-west direction.