
Lesson at a Glance

- **Magnets:** The substances having the property of attracting pieces of iron or some other substances are called *magnets*.
- It is considered that first magnet was discovered by a shepherd named **Magnes**, who lived in ancient Greece.
- **Types of Magnets:** There are two types of magnets:
 - (i) **Natural magnet:** Magnetite is called *natural magnet*. Natural magnet contains iron. It was discovered by Magnes who lived in Greece.
 - (ii) **Artificial magnets:** The magnets formed by the pieces of iron are called *artificial magnets*. They may have different shapes.
- **Shapes of Magnets:** There are various shapes of the magnets:
 - (i) Bar magnets
 - (ii) Horse shoe magnets
 - (iii) Cylindrical magnets
 - (iv) Ball magnets
- **Uses of Magnets:**
 - (i) It is used in refrigerator's door, pencil boxes, toys and pin stand, etc.
 - (ii) It is used in picking up pieces of iron from wastes.
- **Types of materials on the basis of effect of a magnet:** There are two types of materials:
 - (i) **Magnetic materials:** The materials which get attracted towards magnet are called *magnetic materials*. For example: iron, nickel and cobalt.
 - (ii) **Non-magnetic materials:** The materials which are not attracted towards a magnet are called *non-magnetic materials*. For example: wood, rubber or plastic.
- **Poles of Magnet:** The ends of the magnet are called *poles*. There are two poles of a magnet:

- (i) **North Pole:** When a magnet is suspended freely, then one end of the magnet points towards north direction, that end of the magnet is called *north pole*. It is indicated by N.
- (ii) **South Pole:** When a magnet is suspended freely, then the end which points towards south direction is called *south pole* of the magnet. It is indicated by S.
- **Lode stone:** The magnetic stone indicating directions used by sailors in olden days to identify directions is called *lode stone*.
- Interaction between two poles:
 - (i) Like poles repel each other.
 - (ii) Unlike poles attract each other.
- **Strength of a Magnet:**
 - (i) The strength of a magnet is maximum at its poles.
 - (ii) The strength of magnet decreases as we go towards the mid-point of a magnet.
 - (iii) The strength of magnet is very less or zero at the mid-point of a magnet. It is called *neutral point*.
- A piece of any magnetic material can be magnetised by rubbing it with a permanent magnet.
- **Demagnetisation:** The process by which a magnet loses its magnetism is called *demagnetisation*.
- **Self demagnetisation:** When two poles of magnet are left free, the magnet loses its magnetism slowly. This phenomenon is called *self demagnetisation*.
- **Magnetic Keepers:** The soft iron pieces which are used to avoid de-magnetisation of magnets during storage are called *magnetic keepers*.
- **Compass:** The small glass case containing a magnetised needle pivoted on a nail in it is called *compass*. The needle rotates freely and stops in north-south direction.

TEXTBOOK QUESTIONS SOLVED

Q.1. Fill in the blanks in the following:

- (i) Artificial magnets are made in different shapes such as _____, _____ and _____.

- (ii) The materials which are attracted towards a magnet are called _____.
- (iii) Paper is not a _____ material.
- (iv) In olden days, sailors used to find direction by suspending a piece of _____.
- (v) A magnet always has _____ poles.

- Ans. (i) bar magnet, horse-shoe magnet and cylindrical magnet
 (ii) magnetic materials
 (iii) magnetic
 (iv) bar magnet or lode stone
 (v) two or a pair of

Q.2. State whether the following statements are true or false:

- (i) A cylindrical magnet has only one pole.
- (ii) Natural magnets were discovered in Greece.
- (iii) Similar poles of a magnet repel each other.
- (iv) Maximum iron filings stick in the middle of a bar magnet when it is brought near them.
- (v) Bar magnets always point towards North-South direction when suspended freely in air.
- (vi) A compass can be used to find East-West direction at any place.
- (vii) Rubber is a magnetic material.

- Ans. (i) False (ii) True (iii) True
 (iv) False (v) True (vi) True
 (vii) False

Q.3. It was observed that a pencil sharpener gets attracted by both the poles of a magnet although its body is made of plastic. Name a material that might have been used to make some part of it.

Ans. Iron is used to make some part of sharpener due to which it is attracted toward magnet.

Q.4. Column I shows different positions in which one pole of a magnet is placed near that of the other. Column II indicates the resulting action between them for each situation. Fill in the blanks.

Column I	Column II
N-N	_____
N-_____	Attraction
S-N	_____
_____ -S	Repulsion

Ans.

Column I	Column II
N-N	Repulsion
N-S	Attraction
S-N	Attraction
S-S	Repulsion

Q.5. Write any two properties of a magnet.

Ans. Two properties of magnets are:

- A magnet has two poles: North pole and South pole.
- Like poles repel each other and unlike poles attract each other.

Q.6. Where are poles of a bar magnet located?

Ans. Poles are located at the ends of bar magnet just before the ends. These are north and south poles.

Q.7. A bar magnet has no markings to indicate its poles. How would you find out near which end is its north pole located?

Ans. Take the bar magnet and suspend it freely with the help of a thread, the end that points towards north pole will be regarded as north end of the magnet.

Take a bar magnet with known/marked poles on it. Let the north pole of the magnet be brought closer to the suspended magnet at the end that is pointing towards north, if it shows repulsion than it is confirmed.

Q.8. You are given iron strip. How will you make it into a magnet?

Ans. Making a magnet: Take an iron strip and place it on the table. Now take a bar magnet and place one of its poles near one edge of the strip of iron. Without lifting it move it along the length of the iron strip till you reach the other end. Now lift the magnet and bring the pole to the same point of strip from where you began. Repeat this process about 30-40 times. Bring some iron fillings

near the strip and observe that the strip attracts the fillings. This indicates that the iron strip becomes magnet.

Remember that the pole of magnet and direction of its movement should not change.

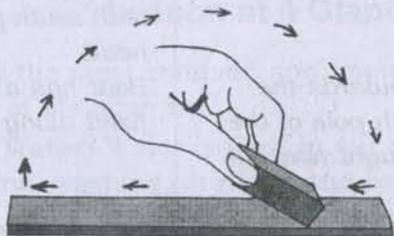


Fig. 13.1 Making your own magnet

Q.9. How is compass used to find direction?

Ans. A compass is a small case of glass. A magnetised needle is pivoted inside the box. The needle can rotate freely. Compass also has a dial with directions marked on it. The compass is kept at the place where we want to know the directions. When the needle comes to rest it indicates north-south direction. The compass is then rotated until the north and south marked on the dial are at the two ends of the needle. Usually different colours are used to point the ends of needle to identify the north and the south poles.

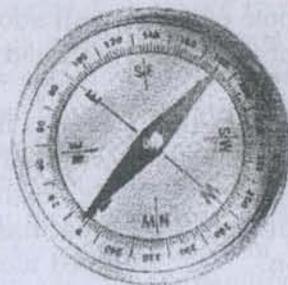


Fig. 13.2 A compass

Q.10. A magnet was brought from different directions towards a toy boat that has been floating in water in a tub. Effect observed in each case is stated in Column I. Possible reason for the observed effects are mentioned in Column II. Match the statements given in Column I with those in Column II.

Column I	Column II
1. Boat gets attracted towards the magnet.	Boat is fitted with a magnet with north pole towards its head.
2. Boat is not affected by the magnet.	Boat is fitted with a magnet with south pole towards its head.
3. Boat moves towards the magnet if north pole of the magnet is brought near its head.	Boat has a small magnet fixed along its length.
4. Boat moves away from the magnet when north pole is brought near its head.	Boat is made of magnetic material.
5. Boat floats without changing magnetic direction.	Boat is made up of non-its material.

Ans.

Column I	Column II
1. Boat gets attracted towards the magnet.	Boat is made up of magnetic material.
2. Boat is not affected by the magnet.	Boat is made of non-magnetic material.
3. Boat moves towards the magnet if north pole of the magnet is brought near its head.	Boat is fitted with a magnet with south pole towards its head.
4. Boat moves away from the magnet when north pole is brought near its head.	Boat is fitted with a magnet with north pole towards its head.
5. Boat floats without changing magnetic direction.	Boat has a small magnet fixed along its length.