

UNIT: 7 MEGNETISM

CLASS : VIII

SUBJECT : SCIENCE

I. Choose the best answer.

- A magnet attracts _____.
a) wooden materials b) any metal c) copper **d) iron and steel**
- One of the following is an example for a permanent magnet.
a) Electromagnet b) Mumetal c) Soft iron **d) Neodymium**
- The south pole of a bar magnet and the north pole of a U-shaped magnet will _____.
a) **attract each other** b) repel each other
c) neither attract nor repel each other d) None of the above
- The shape of the Earth's magnetic field resembles that of an imaginary _____.
a) U-shaped magnet b) straight conductor carrying current
c) solenoid coil **d) bar magnet**
- MRI stands for _____.
a) **Magnetic Resonance Imaging** b) Magnetic Running Image
c) Magnetic Radio Imaging d) Magnetic Radar Imaging
- A compass is used for _____.
a) plotting magnetic lines b) detection of magnetic field
c) navigation **d) All of these**

II. Fill in the blanks.

- The magnetic strength is **maximum** at the poles.
- A magnet has **two** magnetic poles.
- Magnets are used in **dynamo**s for generating electricity.
- Electromagnets** are used to lift heavy iron pieces.
- A freely suspended bar magnet is always pointing along the **geographic** north-south direction.

III. Match the following:

- | | | |
|--------------------------|---|------------------------|
| 1. Magnetite | - | Natural magnet |
| 2. A tiny pivoted magnet | - | Compass box |
| 3. Cobalt | - | Ferromagnetic material |
| 4. Closed curves | - | Magnetic lines |
| 5. Bismuth | - | Diamagnetic material |

IV. Consider the statements given below and choose the correct option.

1. **Assertion:** Iron filings are concentrated more at the magnetic poles.

Reason: The magnets are so sharp.

a. Both assertion and reason are true and reason is the correct explanation of assertion.

b. Both assertion and reason are true, but reason is not the correct explanation of assertion.

c. Assertion is true, but reason is false.

d. Assertion is false, but reason is true.

2. **Assertion:** The Earth's magnetic field is due to iron present in its core.

Reason: At a high temperature a magnet loses its magnetic property or magnetism.

a. Both assertion and reason are true and reason is the correct explanation of assertion.

b. Both assertion and reason are false, but reason is not the correct explanation of assertion.

c. Assertion is true, but reason is false.

d. Assertion is false, but reason is true.

V. Answer briefly:

1. **Define magnetic field.**

Magnetic field is defined as the space around a magnet in which its magnetic effect or influence is observed. It is measured by the unit *tesla* or *gauss* (1 tesla = 10,000 gauss).

2. **What is artificial magnet? Give examples.**

Magnets that are made by people in the laboratory or factory are called artificial magnets. Bar magnets, U-shaped magnets, horseshoe magnets, cylindrical magnets, disc magnets, ring magnets and electromagnets are some examples of artificial magnets.

3. **Distinguish between natural and artificial magnets?**

| Natural Magnets | Artificial Magnets |
|---|--|
| These are found in nature and have irregular shapes and dimensions. | These are man-made magnets. They can be made in different shapes and dimensions. |
| The strength of a natural magnet is | Artificial magnets can be made with |

| | |
|--|--|
| well determined and difficult to change. | required and specific strength. |
| These are long lasting magnets. | Their properties are time bound. |
| They have a less usage. | They have a vast usage in day to day life. |

4. Earth acts as a huge bar magnet. Why? Give reasons.

- A freely suspended magnetic needle at a point on the Earth comes to rest approximately along the geographical north - south direction.
- This shows that the Earth behaves like a huge magnetic dipole with its magnetic poles located near its geographical poles.
- The north pole of a magnetic needle approximately points towards the geographic north (NG). Thus, it is appropriate to say that the magnetic north pole of the needle is attracted by the magnetic south pole of the Earth (Sm), which is located at the geographic north (NG).
- Also, the magnetic south pole of the needle is attracted by the magnetic north pole of the Earth (Nm), which is located at the geographic south (SG).
- The magnitude of the magnetic field strength at the Earth's surface ranges from 25 to 65 micro tesla.

5. How can you identify non-magnetic materials? Give an example of a nonmagnetic material.

- Materials which are not attracted by magnets are called non-magnetic materials.
- Example: Wood, Glass, Rubber, Plastic, Aluminium.

VI. Answer in detail.

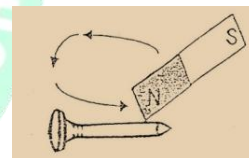
1. List out the uses of magnets.

1. In ancient times, the magnet in the form of 'direction stone' helped seamen to find the directions during a voyage.
2. Nowadays, magnets are used to generate electricity in dynamos.
3. Electromagnets are used in our day-to-day life.
4. They are used in electric bells and electric motors.
5. They are used in loudspeakers and microphones.
6. An extremely powerful electromagnet is used in the fast moving Maglev train to remain floating above the tracks.
7. In industries, magnetic conveyor belts are used to sort out magnetic substances from scraps mixed with non-magnetic substances.

8. Magnets are used in computer in its storing devices such as hard disks.
9. In banks, the magnets enable the computers to read the MICR Magnetic INK character recognition full from technology numbers printed on a cheque.
10. The tip of the screw drivers are made slightly magnetic so that the screws remain attached to the tip.
11. At hospitals, extremely strong electro magnets are used in the MRI (Magnetic Resonance Imaging) to scan the specified internal organ. An extremely strong electromagnet is used in it.

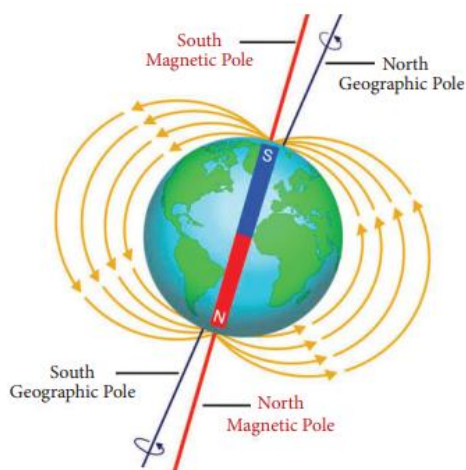
2. How will you convert a 'nail' into a temporary magnet?

- Spread some steel pins on a wooden board and bring an iron nail near them. Are they attracted? Now, make one of the magnetic poles of the bar magnet touch one end of the iron nail.
- Slide it along its length in one direction slowly till the other end is reached. Repeat the process 20 to 30 times as shown in the diagram. The magnet has to be moved in one direction only.
- Avoid the swiping of the magnet back and forth. Now, bring the iron nail near the steel pins. What do you notice? The steel pins stick to the iron nail because nail has become a temporary magnet.



3. Write a note on Earth's magnetism.

- Earth has been assumed or imagined by the scientists as a huge magnetic dipole. However, the position of the Earth's magnetic poles is not well defined in the Earth.
- The south pole of the imaginary magnet inside the Earth is located near the geographic north pole and the north pole of the earth's magnet is located near the geographic south pole. The line joining these magnetic poles is called the magnetic axis.
- The magnetic axis intersects the geographic north pole at a point called the north geomagnetic pole or northern magnetic pole. It intersects the geographic south pole at a point called the south geomagnetic pole or southern magnetic pole.
- The magnetic axis and the geographical axis (axis of rotation) do not coincide with each other. The magnetic axis of the Earth is inclined at an angle of about 10° to 15° with the geographical axis.



The exact cause of the Earth's magnetism is not known even today. However, some important factors, which may be the cause of the Earth's magnetism, are as follows.

- Masses of magnetic substances in the Earth
- Radiations from the Sun
- Action of the Moon

VII. Higher Order Thinking Questions.

1. Though Earth is acting as a huge bar magnet it is not attracting other ferromagnetic materials. Why? Give reasons.

Earth is not attracting other ferromagnetic materials because the magnetic character of ferromagnetic materials is affected by the external temperature. When they are heated, they become paramagnetic at curie temperature.

2. Why it is not advisable to slide a magnet on an iron bar back and forth during magnetising it?

It is not advisable to slide a magnet on an iron bar back and forth because moving it in opposite directions will work to cancel each other out.

3. Thamizh Dharaga and Sangamithirai were playing with a bar magnet. They put the magnet down and it broke into four pieces. How many poles will be there?

Each broken piece behaves like a separate magnet. Therefore, four pieces will have eight poles.

Conclusion:

Thus, we can conclude that unlike poles of a magnet attract each other, i.e., the north pole and the south pole of a magnet attract each other.