



BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI - 110034

SUBJECT:-PHYSICS

CHAPTER:-FUN WITH MAGNETS

Week: 2nd Nov. to 6th Nov. 2020

Number of Blocks : 2/3

TOPIC: FUN WITH MAGNETS

GUIDELINES FOR STUDENTS

Dear Students

- There is only **1 Assignment**.
 - Assignment 1: Based on Sub topics given below.
- Attempt the assignment in Science notebook.
- **Video links** have been provided for better understanding of the concept through visuals. Watch the videos carefully as these will help you in doing the assignment.
- Read the lesson from **NCERT textbook** also.

SUB TOPICS:

- MAGNETIC AND NON-MAGNETIC MATERIALS
- POLES OF MAGNET
- FINDING DIRECTIONS

.INSTRUCTIONAL AIDS:

- You-tube links : <https://youtu.be/h7fQW8oboC0> (Magnetic materials and Non Magnetic materials)
- <https://youtu.be/8D02drYh6qE> (Poles of a magnet)(1:01/1:51)
- <https://youtu.be/c7L3s56ii1k> (finding directions) (1:07/2:29)
- NCERT Link : file:///C:/Users/user/Desktop/ncert-class-6-science-chapter-13%20(1).pdf (pg no.125 to130)

LEARNING OUTCOMES:

By the end of this lesson *each learner will be able to-*

- Differentiate between magnetic and non-magnetic materials.

- Use the magnetic compass to find direction.
- Perform an activity to demonstrate the concept of attraction and repulsion

Introduction

A magnet finds its use at a number of places. For example, refrigerator's door, some pencil boxes, many toys, magnetic stickers, soap stand, pin stand, all make use of a magnet for their functioning.

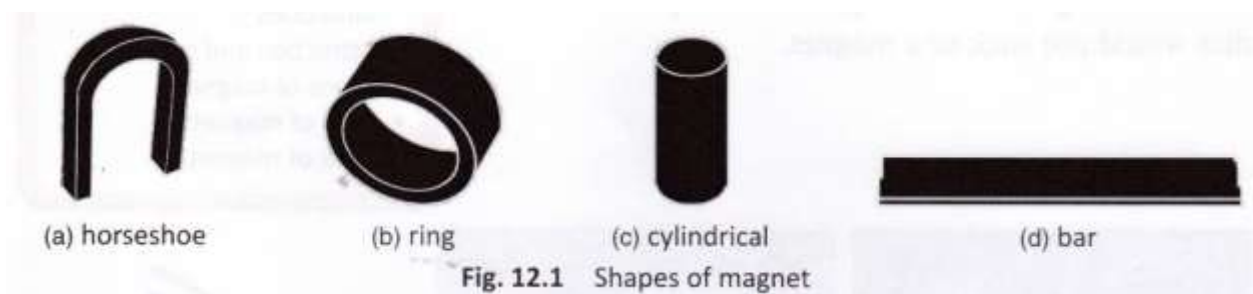


Fig. 13.2 Some common items that have magnets inside them

Story of magnets

It is said that, there was a shepherd named Magnes, who lived in ancient Greece. He used to take his herd of sheep and goats to the nearby mountains for grazing. He would take a stick with him to control his herd. The stick had a small piece of iron attached at one end. One day he was surprised to find that he had to pull hard to free his stick from a rock on the Mountain side. It seemed as if the stick was being attracted by the rock. The rock was a natural magnet and it attracted the iron tip of the shepherd's stick. It is said that this is how natural magnets were discovered. Such rocks were given the name magnetite, perhaps after the name of that shepherd. Magnetite contains iron. Some people believe that magnetite was first discovered at a place called Magnesia. **The substances having the property of attracting iron are now known as magnets.**

Magnetite is called natural magnet. Magnets are made of different materials and in different shapes. For example, bar magnet, horseshoe magnet, cylindrical or a ball-ended magnet.



MAGNETIC AND NON-MAGNETIC MATERIALS

Magnetic materials: The materials which get attracted towards a magnet are magnetic – for example, iron, nickel or cobalt.

Non Magnetic materials: The materials which are not attracted towards a magnet are non-magnetic e.g., leather, plastic, cloth, paper.

Activity

- Rub a magnet in the sand or soil.
- Pull out the magnet.
- Are there some particles of sand or soil sticking to the magnet?
- Now, gently shake the magnet to remove the particles of sand or soil.
- Are some particles still sticking to it? These might be small pieces of iron (iron filings) picked up from the soil.
- Through such an activity, we can find out whether the soil or sand from a given place contains particles that have iron.
- Try this activity near your home, school or the places you visit on your holidays. Does the magnet with iron filings sticking to it, look like any one of those shown in Fig. 13.6?



Fig. 13.6 Magnet with (a) many iron filings (b) few iron filings and (c) no iron filings sticking to it.

POLES OF MAGNET

We observed that iron filings (if they are present) stick to a magnet rubbed in the soil. Did you observe anything special about the way they stick to the magnet?

Activity

- ✚ Spread some iron filings on a sheet of paper.
- ✚ Now, place a bar magnet on this sheet. What do you observe? Do the iron filings stick all over the magnet? Do you observe that more iron filings get attracted to some parts of the magnet than others (Fig. 13.7)?
- ✚ Remove the iron filings sticking to the magnet and repeat the activity. Do you observe any change in the pattern with which the iron filings get attracted by different parts of the magnet?
- ✚ You can do this activity using pins or iron nails in place of iron filings and also with magnets of different shapes.
- ✚ Draw a diagram to show the way iron filings stick to the magnet. Is your drawing similar to that shown in Fig. 13.6 (a)?
- ✚ We find that the iron filings are attracted more towards the region close to two ends of a bar magnet. Poles of a magnet are said to be near these ends.



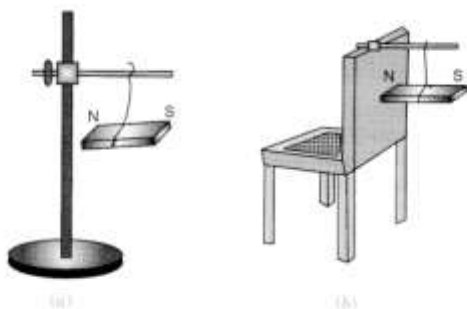
Fig. 13.7 Iron filings sticking to a bar magnet

Magnetic attraction is maximum near the ends of the magnet. These ends are called **magnetic poles**.



FINDING DIRECTIONS

We find that a freely suspended bar magnet always comes to rest in a particular direction, which is the North-South direction.



A freely suspended magnet always comes to rest in the north-south direction

The end of the magnet that points towards North is called its **North seeking end or the North pole of the magnet**. The other end that points towards the South is called **South seeking end or the South pole of the magnet**. All magnets have two poles whatever their shape may be. Usually, north (N) and south (S) poles are marked on the magnets. This property of the magnet is very useful for us. For centuries, travellers have been making use of this property of magnets to find directions. It is said that in olden days, travellers used to find directions by suspending natural magnets with a thread, which they always carried with them.

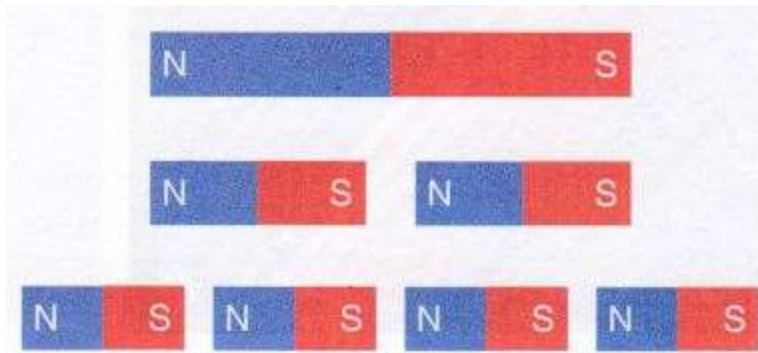


Fig. 12.2 Poles of a bar magnet

The two poles cannot exist independently. That is, they always come in pairs.

If we break a bar magnet in the middle, we would get two pieces, each having a North Pole and a South Pole. We could go on breaking the magnet into smaller pieces, and every time we would get both the poles in each piece.

Compass

A device was developed based on this property of magnets. It is known as the **compass**.



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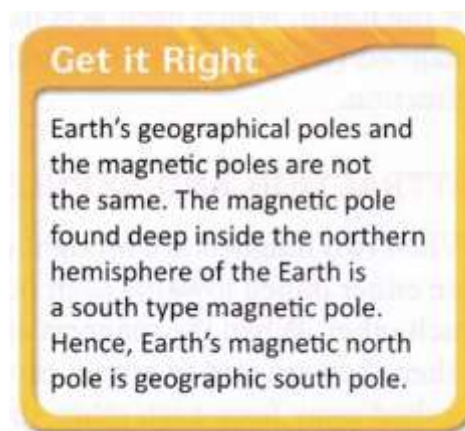


Fig. 13.10 A compass

- ❖ A compass is usually a small box with a glass cover on it.
- ❖ A magnetised needle is pivoted inside the box, which can rotate freely (Fig. 13.10).
- ❖ The compass also has a dial with directions marked on it.
- ❖ The compass is kept at the place where we wish to know the directions.
- ❖ Its needle indicates the north-south direction when it comes to rest.

- ❖ The compass is then rotated until the north and south marked on the dial are at the two ends of the needle.
- ❖ To identify the north-pole of the magnetic needle, it is usually painted in a different colour.

PLEASE NOTE

Do you know why a freely suspended magnet always points in the Earth's north-south direction? It behaves like it is under the influence of another magnet. But where is this other magnet? It is the Earth itself.

ASSIGNMENT 1

Q1. Anjali 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.

Q2. Rahul was provided with an iron strip by his class teacher. How will he make it into a magnet?

Q3. Draw a diagram of a magnetic compass. Mention its use.

Q4. Identify magnetic and non-magnetic substances from the list given below: *Iron, Steel, Nickel, Plastic, Wood, Copper and a Stainless Steel spoon.*

Q5. You are given two rods. Out of these, one is an iron rod and the other one is magnet, how will you identify these rods?

Q6. Mohit dipped a bar magnet in a heap of iron filings and pulled it out. He found that iron filings got stuck to the magnet as shown in figure.



- (i) Which regions of the magnet have more iron filings sticking to it?
- (ii) What are these regions called?