

# MAGNETIC FIELD AND FIELD LINES

Grade: Class 10

## Prerequisite

- Basic understanding of magnets.
- Different types of magnets
- Properties of magnets
- Basic understanding of forces and their effects on objects.

## Introduction

Magnetic field is the region around a magnet, where magnetic forces are experienced. This invisible field exerts a force on other magnets and magnetic materials within its vicinity.

Magnetic fields can be visualized using the concept of magnetic field lines. These lines provide a way to represent the direction and strength of the magnetic field.

The magnetic field lines are closed curves. They never intersect each other. The magnetic field lines are crowded near the pole where the field is strong and spread apart from each other where the field is weak. They flow from the south pole to the north pole within a magnet and north pole to south pole in outside.

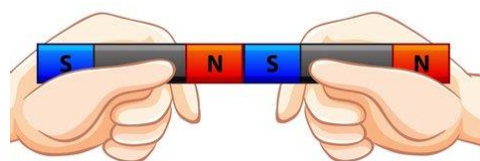
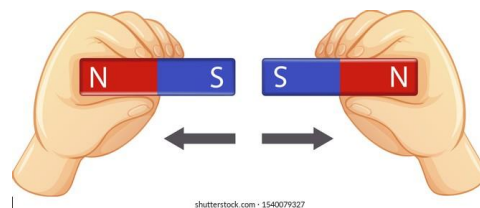
## Inquiry-Based Activity – 1: *Explore the magnetic forces.*

**Objective:** To understand the concept of magnetic force using 2 bar magnets.

**Materials Required:** 2 Bar Magnets.

### Procedure:

- Place 2 bar magnets very far away.
- Observe, is there any kind of attraction or repulsion takes place between those 2 bar magnets when they are held far away.
- Now, bring those two bar magnets nearer and nearer.
- Observe the changes.



### Inference/ Analysis Questions:

1. Is there any kind of attraction or repulsion taking place between those 2 bar magnets?
2. What is making the magnets to repel or attract when they brought nearer?
3. Can we call these attractions or repulsions as a type of force?

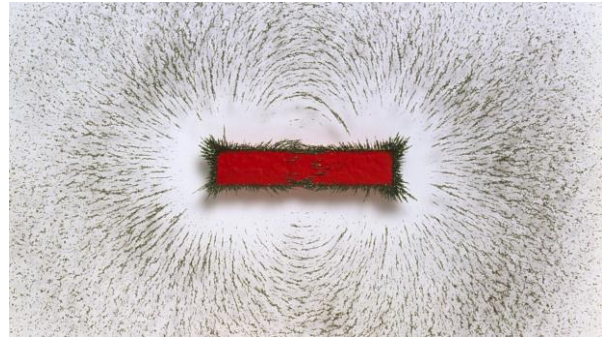
## Inquiry-Based Activity – 2: *Understanding the Magnetic Field and Field Lines*

**Objective:** To understand the concept of magnetic field and Field Lines and exploring the properties of magnetic field lines.

**Materials Required:** Bar magnet, Iron filings, White paper/board.

**Procedure:**

- i) Take a white sheet paper/board
- ii) Spread the iron filing on the white paper/board
- iii) Take the bar magnet and place it at the centre of the board.
- iv) Tap the board gentle.
- v) Observe the changes happened with respect to iron filings around the bar magnet.

**Inference/ Analysis Questions:**

1. What happened to the iron filings?
2. Why do the iron filings arrange in such a pattern?
3. What does this pattern tell us?

**Assessment questions:**

1. Define magnetic field.
2. What does magnetic field lines convey?
3. List out the properties of magnetic field lines.
4. Magnetic field lines touch each other. State true or false.
5. Draw the pattern of magnetic field lines.

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