Properties of a Magnetic Field

EXERCISE [PAGE 130]

Exercise | Q 1.1 | Page 130

Write the appropriate term in the blanks.

The alloys called_____and_____are used for making industrial magnets.

Solution: The alloys called **alnico** and **nipermag** are used for making industrial magnets.

Exercise | Q 1.2 | Page 130

Write the appropriate term in the blanks.

A magnetic field can pass through _____and _____.

Solution: The alloys called **alnico** and **nipermag** are used for making industrial magnets.

Exercise | Q 1.3 | Page 130

Write the appropriate term in the blank.

The intensity of a magnetic field is indicated by the lines of_____

Solution: The intensity of a magnetic field is indicated by the lines of **magnetic force passing perpendicularly through a unit area**.

Exercise | Q 1.4 | Page 130

Write the appropriate term in the blank.

The real test of a magnet is_____

Solution: The real test of a magnet is **repulsion**.

Exercise | Q 2 | Page 130

With whom should I pair up?

Group 'A'	Group 'B'
(a) Compass	1. The highest magnetic force
(b) The door of a cupboard	2. Like poles

(c) Repulsion	3. A magnet
(d) Magnetic pole	4. A magnetic needle

Solution:

Group 'A'	Group 'B'
(a) Compass	4. A magnetic needle
(b) The door of a cupboard	3. A magnet
(c) Repulsion	2. Like poles
(d) Magnetic pole	1. The highest magnetic force

Exercise | Q 3.1 | Page 130

Write the answer to the following question:

Distinguish between the two methods of making artificial magnets.

Solution: The two methods of making artificial magnets are:

Single Touch Method	Double Touch Method
The magnetic strength of the magnet created using this method is low.	The magnetic strength of the magnet created using this method is high as compared to a single touch method.
The magnetism of the magnet created using this method lasts for a shorter time.	The magnetism of the magnet created using this method lasts for a longer time as compared to a single touch method.

Exercise | Q 3.2 | Page 130

Write the answer to the following question:

Which substances are used for making electromagnets?

Solution: To make an electromagnet we require the following things:

- A long conducting copper wire
- An iron nail on which the copper wire has to be wound
- A switch
- A battery

Exercise | Q 3.3 | Page 130

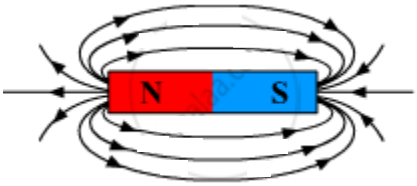
Write the answer to the following question:

Write a note on the 'magnetic field'.

Solution: The magnetic field is defined as the region around a magnet where the magnetic force can be experienced by an object. Magnetic field lines are the geometrical representation of the magnetic field. Following are the characteristics of magnetic field lines:

- Magnetic field lines emanate from the North Pole and terminate at the South Pole of a magnet (outside the magnet).
- The degree of closeness of magnetic field lines represents the relative strength of the magnet.
- No two field lines can intersect each other.

Field lines due to a bar magnet are shown below:



Magnetic field lines due to a bar magnet

Exercise | Q 3.4 | Page 130

Write the answer to the following question:

Why is a magnetic needle used in a compass?

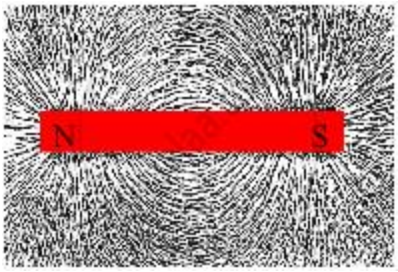
Solution: The Earth behaves as a magnet with its magnetic South-Pole coinciding with the geographic North-Pole and magnetic North-Pole coinciding with the geographic South-Pole. Thus, in a compass, a magnetic needle is used to show the geographic north direction by aligning itself in the direction magnetic South-Pole of the Earth.

Exercise | Q 3.5 | Page 130

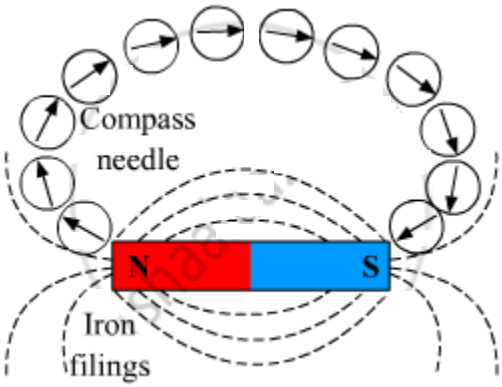
Write the answer to the following question:

Explain with the help of a diagram how the intensity and direction of the magnetic field of a bar magnet can be determined.

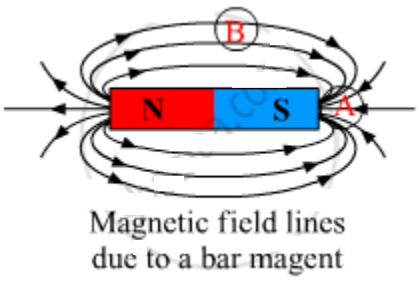
Solution: Take drawing cardboard and sprinkle some iron filings on it. Notice the position of the iron filings as a whole. Now, take a bar magnet and slowly bring it below the cardboard. You will observe that the iron filings tend to attract towards the magnet as shown below.



To find the direction of the magnetic field around a bar magnet, place a magnetic compass with its South-Pole near one of the poles of the bar magnet. Locate and the point where the North-pole of the needle points. Now, lift the needle and place its South-Pole on the marked point. Now, again see where it North-Pole points. Repeat this process and you will get the direction of the magnetic field as shown below.



To find the intensity of the magnetic field around a region of a bar magnet, we need to calculate the number of lines crossing through the unit area of that region. For example, if we have to calculate the intensity of the magnetic field at points A and B, then draw unit areas around A and B first and then calculate the number of lines passing through that area. By doing so, we see that the intensity of the field at A is greater than that at B.



Magnetic field lines
due to a bar magent

Exercise | Q 4 | Page 130

Give detailed information about how the merchants of olden times used a magnet while travelling.

Solution: In the past, it was known that a piece of magnetite (stones having magnetic properties), when hung freely, points in the North-South direction. Thus, these stones were used by merchants of olden times to find direction while travelling through unknown regions. These stones are also called loadstones (leading stones).