

Exploring Magnets

Chapter-4

Ques 1.

Fill in the blanks.

(i) Unlike poles of two magnets _____ each other, whereas like poles _____ each other.

Answer:

attract, repel

(ii) The materials that are attracted towards a magnet are called _____.

Answer:

magnetic materials

(iii) The needle of a magnetic compass rests along the _____ direction.

Answer:

North – South

(iv) A magnet always has _____ poles.

Answer: North and South

Ques 2. State whether the following statements are True (T) or False (F).

(i) A magnet can be broken into pieces to obtain a single pole.

Answer: False

(ii) Similar poles of a magnet repel each other.

Answer: True

(iii) Iron filings mostly stick in the middle of a bar magnet when it is brought near them.

Answer: False

(iv) A freely suspended bar magnet always aligns with the north-south direction.

Answer:

True

Ques 3.

Column I shows different positions in which one pole of a magnet is placed near that of the other. Column II indicates the resulting interaction between them for different situations. Fill in the blanks.

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

Answer:

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

Ques 4.

Atharv performed an experiment in which he took a bar magnet and rolled it over a heap of steel U-clips (Fig. 4.15).



Bar magnet and heap of steel U-clips

Table 4.3 : Number of pins attracted by the magnet at its various positions

	Position A	Position B	Position C
(i)	10	2	10
(ii)	10	10	2
(iii)	2	10	10
(iv)	10	10	10

According to you, which of the options given in Table 4.3 is likely to be his observation?

Answer:

(i) According to Atharv's experiment, option

(i) is likely to be his observation. At position A, Atharv observed that 10 steel U-clips were attracted. In the middle of the bar magnet, he found only 2 U-clips sticking. At position C, 10 U-clips were again attracted. This suggests that the magnetic field is equally strongest at the poles (Positions A and C) and weakest in the middle (Position B).

Ques 5.

Reshma bought three identical metal bars from the market. Out of these bars, two were magnets and one was just a piece of iron. How will she identify which two amongst the three could be magnets (without using any other material)?

Answer:

Reshma can identify which two bars are magnets by following these steps:

1. Check for Attraction: Take one bar and bring it near the other two bars. Magnets attract each other, so" if a bar is a magnet, it will pull towards another magnet.

2. Test for Repulsion: After finding one magnet (it attracts another bar), test the remaining bar against the first magnet. Magnets push away from each other when their similar ends (North-North or South-South) are together. By using these methods of attraction and repulsion, Reshma can figure out

which two bars are magnets. The bar that only attract and do not repel the others is likely the piece of iron.

Ques 6.

You are given a magnet which does not have the poles marked. How can you find its poles with the help of another magnet which has its poles marked?

Answer:

Bring one end of the marked magnet close to each end of the unmarked magnet. If it attracts, the unmarked end is the opposite pole (e.g., if N attracts, the unmarked end is S).

And if it repels, the unmarked end is the same pole (e.g., if N repels, the unmarked end is N).

Ques 7.

A bar magnet has no markings to indicate its poles. How would you find out near which end its North pole is located without using another magnet?

Answer:

Take the bar magnet and suspend it freely with the help of a thread, the end that points towards north direction (marked with help of the direction in which Sun rises or sets) will be regarded as north pole of the magnet.

Ques 8.

If the earth is itself a magnet, can you guess the poles of Earth's magnet by looking at the direction of the magnetic compass?

Answer:

Yes, we can determine the poles of Earth's magnet by observing the direction of a magnetic compass. The needle of a magnetic compass points towards Earth's magnetic North Pole. When you hold a compass, the end of the needle marked 'N' (North) indicates the direction of Earth's magnetic North Pole. The opposite direction, marked 'S' (South), points towards Earth's magnetic South Pole.

Ques 9.

While a mechanic was repairing a gadget using a screw driver, the steel screws kept falling down. Suggest a way to solve the problem of the mechanic on the basis of what you have learnt in this chapter.

Answer:

Using a magnet is a practical solution to the given problem because it allows the mechanic to retrieve the steel screws easily without having to search for them or risk losing them further. This method utilises the magnetic properties of steel screws to make repair work more efficient and less problematic.

Ques 10.

Two ring magnets X and Y are arranged as shown in mg. 4.16. It is observed that the magnet X does not move down further. What could be the possible reason? Suggest a way to bring the magnet X in contact with magnet Y, without pushing either of the magnets.



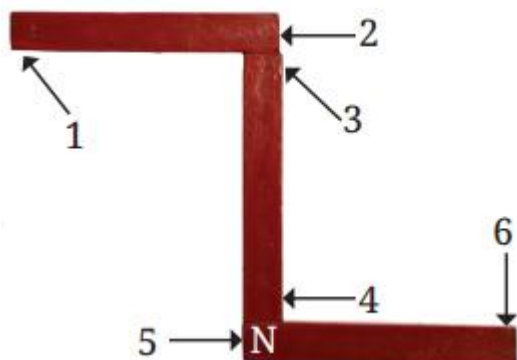
Two ring magnets

Answer:

This happens because magnets have North and South poles, and magnets with the same pole facing each other push away or repel each other. So, magnet X has the same pole as magnet Y. We can suggest that turn magnet X around and flip it over so that the side which was facing up is now facing down. This changes the direction of its poles. Now, the opposite pole of magnet X attracts the magnet Y so it can be brought more closer to magnet Y without pushing either of the magnets.

Ques 11.

Three magnets are arranged on a table in the form of the shape shown in Fig. 4.17. What is the polarity, N or S, at the ends 1, 2, 3, 4, 5 and 6 of the magnets? Polarity of one end (5) is given for you.



Three bar magnets

Answer:

The polarity at the end 1 is North, 2 is South, 3 is North, 4 is South and 6 is South Pole.

