

Chapter 4: Exploring Magnets

Worksheet 3 — Picture Based Questions (3 Practice Sets with Answers)

SET A — Picture Based Worksheet

Name: _____ Date: _____

Class: _____ Section: _____

Study each picture carefully and answer the questions that follow.

Picture 1



Fig. 4.1: Some common items that have magnets attached to them

1.1. Identify any three items in the picture that use magnets to stay closed or attached. [2 Marks]

1.2. Why are magnets used in such items instead of ordinary metal pieces? [2 Marks]

1.3. Name one more household item (not shown in the picture) that uses a magnet. [2 Marks]

Picture 2



Fig. 4.2: Magnets of different shapes

2.1. Name the three shapes of magnets shown in the picture. [2 Marks]

2.2. Which magnet in the picture has its two poles closest together, and why? [2 Marks]

2.3. Give one use of a ring magnet. [2 Marks]

Picture 3



Fig. 4.4: Iron filings sticking to a bar magnet

Fig. 4.4: Iron filings sticking to a bar magnet

3.1. Where do the maximum iron filings stick on the bar magnet in the picture? [2 Marks]

3.2. Label the two poles visible in the picture. [2 Marks]

3.3. What does this picture prove about the poles of a magnet? [2 Marks]

Picture 4



Fig. 4.6: A magnetic

Fig. 4.6: A magnetic compass

4.1. Name the device shown in the picture. [2 Marks]

4.2. What is the function of the needle in this device? [2 Marks]

4.3. Which direction does the red end of the needle usually point to? [2 Marks]

Picture 5



Fig. 4.9: A compass needle and a magnet
Fig. 4.9: A compass needle and a magnet

5.1. What is happening to the compass needle in picture (a)? [2 Marks]

5.2. What is happening to the needle in picture (b)? [2 Marks]

5.3. What rule of magnetism explains the difference between (a) and (b)? [2 Marks]

✓ ANSWER KEY — Set A

Picture 1 (Fig. 4.1: Some common items that have magnets attached to them)

- 1.1. The pencil pouch, phone flap-cover, lunch box, cupboard door, and fridge magnets are examples shown in the picture; any three of these are correct.
- 1.2. Magnets are used because they can hold two parts together firmly through attraction and can be opened and closed easily, unlike a fixed metal piece.
- 1.3. A magnetic clip holder, magnetic whiteboard duster, or a magnetic bottle opener (any correct example).

Picture 2 (Fig. 4.2: Magnets of different shapes)

- 2.1. The bar magnet, the U-shaped magnet, and the ring magnet.
- 2.2. The U-shaped magnet, because its bent shape brings its two ends (poles) close to each other.
- 2.3. Ring magnets are used in toys like the 'Hopping Frog' and in various devices where a magnet with a hole is needed.

Picture 3 (Fig. 4.4: Iron filings sticking to a bar magnet)

- 3.1. The maximum iron filings stick near the two ends of the bar magnet.
- 3.2. The two poles are the North (N) pole and the South (S) pole, as marked on the magnet in the picture.
- 3.3. It proves that the magnetic force of a magnet is strongest at its poles and much weaker at the middle.

Picture 4 (Fig. 4.6: A magnetic compass)

- 4.1. The picture shows a magnetic compass.
- 4.2. The needle is a small freely rotating magnet that always points along the north-south direction, helping us find directions.
- 4.3. The red end of the needle usually points towards the North direction.

Picture 5 (Fig. 4.9: A compass needle and a magnet)

- 5.1. In picture (a), the North pole of the bar magnet is brought near the North pole of the compass needle, and the needle moves away.
- 5.2. In picture (b), the South pole of the bar magnet is brought near the North pole of the compass needle, and the needle moves closer.
- 5.3. Like poles repel each other (as in a), while unlike poles attract each other (as in b).

SET B — Picture Based Worksheet

Name: _____ Date: _____

Class: _____ Section: _____ Marks Obtained: _____ / _____

Study each picture carefully and answer the questions that follow.

Picture 1



Fig. 4.1: Some common items that have magnets attached to them

1.1. List two materials used to make the objects shown in the picture. [2 Marks]

1.2. Are all the objects shown made entirely of magnetic material? Explain. [2 Marks]

1.3. How does a magnet help keep the pencil box or purse closed? [2 Marks]

Picture 2



Fig. 4.2: Magnets of different shapes

2.1. Which magnet in the picture would you choose to make a simple compass needle, and why? [2 Marks]

2.2. Compare the bar magnet and the ring magnet based on their shape. [2 Marks]

2.3. Can a magnet exist with only one pole, as suggested by any of these shapes? [2 Marks]

Picture 3



Fig. 4.4: Iron filings sticking to a bar magnet

Fig. 4.4: Iron filings sticking to a bar magnet

3.1. Why do very few iron filings stick to the middle of the bar magnet? [2 Marks]

3.2. What would happen if this experiment were repeated with a U-shaped magnet? [2 Marks]

3.3. Under which activity and title does this figure appear in the chapter? [2 Marks]

Picture 4



Fig. 4.6: A magnetic

Fig. 4.6: A magnetic compass

4.1. What is placed below the needle in a magnetic compass? [2 Marks]

4.2. How is a magnetic compass used to find directions at a particular place? [2 Marks]

4.3. Why is the compass box gently rotated after the needle comes to rest? [2 Marks]

Picture 5



Fig. 4.9: A compass needle and a magnet
Fig. 4.9: A compass needle and a magnet

5.1. In picture (a), which poles are facing each other? [2 Marks]

5.2. In picture (b), which poles are facing each other? [2 Marks]

5.3. State whether pictures (a) and (b) show attraction or repulsion. [2 Marks]

✓ ANSWER KEY — Set B

Picture 1 (Fig. 4.1: Some common items that have magnets attached to them)

- 1.1. The objects are made of materials such as plastic, metal, wood, and fabric, with small magnets fitted inside them.
- 1.2. No, the outer bodies are mostly non-magnetic (plastic, wood, fabric); only the small embedded pieces that provide the holding force are magnetic.
- 1.3. The magnet attracts a small piece of iron or another magnet fixed on the opposite flap, so the two parts stay attracted and closed together.

Picture 2 (Fig. 4.2: Magnets of different shapes)

- 2.1. The bar magnet, because its narrow, elongated shape makes it easy to mount and balance so that it can rotate freely.
- 2.2. The bar magnet is a straight, elongated piece with two poles at its ends, while the ring magnet is circular with a hole in the middle.
- 2.3. No, whatever the shape, every magnet always has two poles that exist in pairs; a single pole is never possible.

Picture 3 (Fig. 4.4: Iron filings sticking to a bar magnet)

- 3.1. Because the magnetic force is weakest in the middle region of the magnet, away from its poles.
- 3.2. The iron filings would again stick mostly near its two ends (poles), which in a U-shaped magnet are close together at the open ends.
- 3.3. It appears under Activity 4.2: 'Let us investigate', in the section on the poles of a magnet.

Picture 4 (Fig. 4.6: A magnetic compass)

- 4.1. A dial with directions marked on it is placed below the needle.
- 4.2. The compass is kept at the place, and once the needle comes to rest, the box is rotated until north-south on the dial aligns with the needle; then all directions can be read from the dial.
- 4.3. It is rotated so that the north and south marked on the dial line up correctly with the needle, allowing accurate directions to be read.

Picture 5 (Fig. 4.9: A compass needle and a magnet)

- 5.1. The North pole of the bar magnet and the North pole of the compass needle are facing each other.
- 5.2. The South pole of the bar magnet and the North pole of the compass needle are facing each other.
- 5.3. Picture (a) shows repulsion (needle moves away), while picture (b) shows attraction (needle moves closer).

SET C — Picture Based Worksheet

Name: _____ Date: _____

Class: _____ Section: _____ Marks Obtained: _____ / _____

Study each picture carefully and answer the questions that follow.

Picture 1



Fig. 4.1: Some common items that have magnets attached to them

1.1. Based on the picture, name any two places in a home or school where you have seen magnets used. [2 Marks]

1.2. Would a wooden cupboard door with a plastic clip work the same way as the magnetic one shown? Why or why not? [2 Marks]

1.3. Are the magnets shown in the picture natural or artificial magnets? [2 Marks]

Picture 2



Fig. 4.2: Magnets of different shapes

2.1. Describe in words the three magnet shapes shown in the picture. [2 Marks]

2.2. Which of these three shapes would be easiest to carry inside a pencil box? [2 Marks]

2.3. Why do you think magnets are made in different shapes for different uses? [2 Marks]

Picture 3



Fig. 4.4: Iron filings sticking to a bar magnet

Fig. 4.4: Iron filings sticking to a bar magnet

3.1. What material is sprinkled on the paper in this picture? [2 Marks]

3.2. What safety precaution should be taken while doing this activity? [2 Marks]

3.3. What can we conclude about a magnet's attraction strength at different points along its length? [2 Marks]

Picture 4



Fig. 4.6: A magnetic

Fig. 4.6: A magnetic compass

4.1. What shape is the magnet inside a magnetic compass? [2 Marks]

4.2. Why must the needle be free to rotate for the compass to work correctly? [2 Marks]

4.3. In which historical device from the chapter was a similar magnetised object used by Indian sailors? [2 Marks]

Picture 5



Fig. 4.9: A compass needle and a magnet
Fig. 4.9: A compass needle and a magnet

5.1. If the South pole of the bar magnet were brought near the South pole of the needle instead, what would you expect to observe? [2 Marks]

5.2. Why is this experiment useful in proving that a compass needle is itself a magnet? [2 Marks]

5.3. Which activity from the chapter describes this experiment? [2 Marks]

✓ ANSWER KEY — Set C

Picture 1 (Fig. 4.1: Some common items that have magnets attached to them)

- 1.1. On a refrigerator door and inside a school pencil pouch or writing-board duster (any two correct examples).
- 1.2. No, because a plastic clip is non-magnetic and would not attract or hold the door shut the way a magnet does.
- 1.3. They are artificial magnets, made by humans for use in these everyday items.

Picture 2 (Fig. 4.2: Magnets of different shapes)

- 2.1. A bar magnet is a straight rectangular piece; a U-shaped magnet is bent like the letter U; a ring magnet is a flat circular piece with a hole in the centre.
- 2.2. The bar magnet, because of its small, flat, straight shape that fits easily inside a pencil box.
- 2.3. Different shapes suit different purposes and devices — for example, a ring magnet fits around an axle, while a U-shaped magnet concentrates its poles close together for stronger local attraction.

Picture 3 (Fig. 4.4: Iron filings sticking to a bar magnet)

- 3.1. Iron filings, which are very small pieces of iron, are sprinkled on the paper.
- 3.2. Iron filings should be handled carefully and not touched with bare hands near the eyes, and hands should be washed after the activity.
- 3.3. We can conclude that a magnet's attraction is strongest at its two poles and much weaker in the middle.

Picture 4 (Fig. 4.6: A magnetic compass)

- 4.1. It is in the shape of a small needle.
- 4.2. Because it needs to turn freely so that it can align itself along the Earth's north-south magnetic direction to show correct directions.
- 4.3. The matsya-yantra, which used a magnetised fish-shaped iron piece floating in oil.

Picture 5 (Fig. 4.9: A compass needle and a magnet)

- 5.1. The needle would move away, since like poles (South-South) repel each other.
- 5.2. Because the needle shows attraction and repulsion with the bar magnet's poles, a behaviour shown only by magnets.
- 5.3. Activity 4.6: 'Let us experiment', which studies the interaction between a compass needle and a bar magnet.