GWALNET

CLASS 6 SCIENCE

Chapter 4 – Exploring Magnets

NCERT / Curiosity-based Student Notes

Subject	Science
Class	6
Chapter	4 – Exploring Magnets
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Quick idea: Magnets can attract certain materials, have two poles, help us find directions, and can attract or repel other magnets.

1. Introduction to Magnets

A magnet is an object that can attract certain materials and can also interact with another magnet. Magnets are used in many everyday objects such as pencil boxes, toys, stickers and other devices.

Natural and Artificial Magnets

- **Natural magnets:** Naturally occurring magnetic materials such as lodestones were used in ancient times.
- **Artificial magnets:** Magnets made by people. School-laboratory magnets and magnets used in toys and pencil boxes are examples.

Common shapes of magnets include bar magnets, U-shaped magnets and ring magnets.

2. Magnetic and Non-magnetic Materials

Magnetic materials are materials attracted towards a magnet. Iron is a magnetic material. Nickel and cobalt are also magnetic metals.

Non-magnetic materials are materials that are not attracted towards a magnet. Common examples include wood, plastic, rubber and glass.

Remember: not every metal is necessarily attracted to a magnet. The material itself determines whether it shows magnetic attraction.

Activity idea

- Collect objects made of different materials.
- Predict which objects will be attracted by a magnet.
- Bring a magnet near each object and record the observation.
- Compare your prediction with the actual result.

3. Poles of a Magnet

A bar magnet attracts iron filings most strongly near its two ends. These ends are called the **poles** of the magnet.

- **North pole (N)**
- **South pole (S)**

The two poles always occur together. If a magnet is broken into smaller pieces, each piece still has a North pole and a South pole. A single isolated North or South pole cannot be obtained by simply breaking a magnet.

Key observation

- Iron filings gather mainly near the poles.
- The magnetic effect is strongest near the poles.
- Both poles are present in every ordinary magnet.

4. Finding Directions with a Magnet

A freely suspended bar magnet tends to settle along the **north-south direction**. This property can be used to identify directions.

Simple activity

- Suspend a bar magnet horizontally using a thread tied near its middle.
- Rotate it gently and allow it to come to rest.
- Mark the direction in which the magnet settles.
- Repeat the experiment and observe that it returns to the same general direction.

This property of magnets was useful to travellers and sailors before modern navigation systems.

5. Magnetic Compass

A **magnetic compass** is a device used to find directions. It contains a small magnetic needle that can rotate freely. The needle settles approximately along the north-south direction.

- The compass needle is itself a small magnet.
- The marked end helps identify the direction.
- A compass should be kept away from strong magnets while taking a direction reading.

6. Attraction and Repulsion

When two magnets are brought near each other, their poles interact.

Poles brought together	Result
North – North	Repulsion
South – South	Repulsion
North – South	Attraction

- **Like poles repel:** N–N and S–S.
- **Unlike poles attract:** N–S.

This is one of the most important rules of the chapter.

7. Magnetic Effect Through Non-magnetic Materials

The magnetic effect can act through materials such as wood, cardboard, plastic and glass. For example, a magnet can influence a magnetic object even when a thin non-magnetic material is placed between them.

Examples

- Moving steel balls through a maze using a magnet below the tray.
- Picking up a steel paper clip from water without touching it directly.
- Moving a magnetic object without direct contact.

8. Fun with Magnets and Applications

Magnets can be used to make simple toys and demonstrations. Their ability to attract magnetic materials without direct contact makes them useful in many situations.

Examples to explore

- Magnetic garland.
- Magnet-controlled maze.
- Retrieving a steel paper clip from water.
- Simple magnet-powered toy cars.
- Using magnets to hold or close objects.

9. How to Keep Magnets Safe

- Do not heat a magnet.
- Do not drop or hammer a magnet.
- Keep magnets away from mobile phones and remote controls.
- Store magnets properly so that they retain their magnetic strength.
- Bar magnets may be stored in pairs with unlike poles on the same side, with suitable separators/soft iron pieces as recommended.

10. Important Definitions

Term	Meaning
Magnet	An object that attracts certain magnetic materials and interacts with other magnets.
Magnetic material	A material attracted towards a magnet.
Non-magnetic material	A material not attracted towards a magnet.
Pole	An end region of a magnet where magnetic attraction is strongest.
Magnetic compass	A device containing a magnetic needle used to find directions.
Attraction	The pulling interaction between unlike magnetic poles.
Repulsion	The pushing interaction between like magnetic poles.

11. Chapter at a Glance

- Magnets occur naturally and can also be made artificially.
- Magnets come in different shapes, such as bar, U-shaped and ring magnets.
- Iron, nickel and cobalt are examples of magnetic materials.
- Wood, plastic, rubber and glass are examples of non-magnetic materials.
- Every magnet has a North pole and a South pole.
- A freely suspended magnet settles along the north-south direction.
- A magnetic compass helps us find directions.
- Like poles repel each other.
- Unlike poles attract each other.
- Magnetic effects can act through some non-magnetic materials.
- Magnets should be stored and handled carefully.

12. Important Questions with Answers

Q1. What are magnetic materials?
Materials that are attracted towards a magnet are called magnetic materials. Iron, nickel and cobalt are examples.

Q2. What are non-magnetic materials?
Materials that are not attracted towards a magnet are called non-magnetic materials. Wood, plastic and glass are common examples.

Q3. What are the two poles of a magnet?
The two poles are the North pole and the South pole.

Q4. Can a magnet have only one pole?
No. The poles of a magnet occur in pairs. Breaking a magnet produces smaller magnets, each with both poles.

Q5. Why does a freely suspended magnet help in finding directions?
It tends to settle along the north-south direction, so its position can be used to identify directions.

Q6. What is a magnetic compass?
It is a device containing a freely rotating magnetic needle that indicates the north-south direction.

Q7. What happens when like poles are brought together?
Like poles repel each other.

Q8. What happens when unlike poles are brought together?
Unlike poles attract each other.

Q9. Can magnetic effect act through wood or plastic?
Yes. The magnetic effect can act through suitable non-magnetic materials such as wood, cardboard, plastic and glass.

Q10. How should magnets be handled?
They should not be heated, dropped or hammered, and they should be stored properly and kept away from sensitive devices.

13. Multiple Choice Questions (MCQs)

1. Which material is attracted by a magnet?

A. Wood

B. Plastic

C. Iron

D. Glass

Answer: C

2. Which are the two poles of a magnet?

A. East and West

B. North and South

C. Up and Down

D. Left and Right

Answer: B

3. What happens between two North poles?

A. Attraction

B. Repulsion

C. No effect

D. Melting

Answer: B

4. What happens between a North pole and a South pole?

A. Attraction

B. Repulsion

C. No interaction

D. Heating

Answer: A

5. Which device is used to find directions?

A. Thermometer

B. Compass

C. Barometer

D. Stopwatch

Answer: B

6. Which is a non-magnetic material?

A. Iron

B. Nickel

C. Cobalt

D. Plastic

Answer: D

7. Where is the magnetic effect generally strongest in a bar magnet?

A. At its poles

B. At the exact middle only

C. Outside the magnet only

D. Nowhere

Answer: A

8. Can breaking a magnet produce a single pole?

A. Yes

B. No

C. Only sometimes

D. Only for ring magnets

Answer: B

9. A freely suspended magnet generally settles in which direction?

A. East-West

B. North-South

C. Up-Down

D. Any direction

Answer: B

10. Which should be avoided to protect a magnet?

A. Careful storage

B. Keeping it clean

C. Heating or hammering it

D. Keeping it in a safe place

Answer: C

14. Fill in the Blanks

- The two poles of a magnet are the _____ and _____ poles.
- Materials attracted by a magnet are called _____ materials.
- The needle of a magnetic compass indicates the _____ direction.
- Like poles _____ each other.

• Unlike poles _____ each other.

• A magnet cannot have only a single _____.

15. True or False

• A magnet can be broken to obtain a single North pole. — **False**

• Like poles repel each other. — **True**

• Iron is a magnetic material. — **True**

• A freely suspended magnet generally aligns north-south. — **True**

• The magnetic effect cannot pass through non-magnetic materials. — **False**

16. Competency-Based Questions

1. Three similar metal bars are given. Two are magnets and one is ordinary iron. How can you identify the magnets without another material?
Hint: Use the fact that a magnet has poles and shows attraction/repulsion depending on the pole interaction.

2. A bar magnet has no markings. How can you identify its North pole using a known magnet?
Hint: Bring a known pole near each end and use attraction/repulsion.

3. A magnet is suspended freely. It repeatedly settles in the same direction. What property of magnets does this demonstrate?
Answer: A freely suspended magnet aligns approximately north-south.

4. A steel clip is under a thin sheet of cardboard. Can a magnet placed above the cardboard affect it?
Answer: Yes. Magnetic effect can act through non-magnetic materials.

17. Quick Revision Chart

Concept	Remember
Magnetic material	Attracted by magnet
Non-magnetic material	Not attracted by magnet
Poles	North and South
Like poles	Repel
Unlike poles	Attract
Freely suspended magnet	North-South direction
Compass	Finds directions
Magnetic effect	Can act through some non-magnetic materials

Source basis: These notes are a student-friendly summary prepared from the uploaded NCERT Curiosity Grade 6 Science Chapter 4, “Exploring Magnets”.