

Exploring Magnets

Class 6 Science (Curiosity), Chapter 4

These handwritten revision notes cover magnetic and non-magnetic materials, poles, compass directions, attraction, repulsion, and safe storage of magnets.

- * A magnet attracts magnetic materials such as iron, nickel, and cobalt.
- * A magnet has two poles, and a single pole cannot exist alone.
- * A freely suspended magnet rests along the north-south direction.

like poles repel, unlike poles attract



Bar magnet has two poles

Chapter Story

Reshma writes a sea-travel story and wonders how sailors found directions when ^{*}stars were hidden.

She learns that travellers used a magnetic compass for directions.

The chapter connects common magnets in pencil boxes, purses, dusters, toys, and compasses.

Remember

- * Magnets may be natural or artificial.
- * Lodestone is a naturally occurring magnet.
- * Artificial magnets are made in many shapes.

NCERT anchor: Reshma story and compass need.

Common Magnets

A magnet can be bar-shaped, U-shaped, ring-shaped, or made in a special shape for a device.

The shape may change, but the basic magnetic behaviour stays the same.

Magnets are used to hold things, sort things, pick things, and show directions.

Remember

- * Look for magnets in pencil boxes and cupboard doors.
- * Laboratory magnets are artificial magnets.
- * A compass uses a small magnetic needle.

NCERT anchor: Fig. 4.1 and Fig. 4.2.

Magnetic Materials

Materials attracted by a magnet are called magnetic materials.

Iron is a magnetic material. Nickel and cobalt are also magnetic.

Some combinations of these metals with other metals are also attracted by magnets.

object	result
iron nail	magnetic
steel clip	magnetic
wood	non-magnetic
plastic	non-magnetic*
glass	non-magnetic
rubber	non-magnetic

NCERT anchor: Activity 4.1 material test.

Non-Magnetic Materials

Materials not attracted by a magnet are called non-magnetic materials.

The object may be shiny and still non-magnetic, so do not judge only by looks.

Activity 4.1 asks us to predict first and then test using a magnet.

Remember

- * Prediction can be wrong, observation decides.
- * Record material, prediction, and result.
- * Use a table to compare objects cleanly.

NCERT anchor: Table 4.1 observations.

Poles Of A Magnet

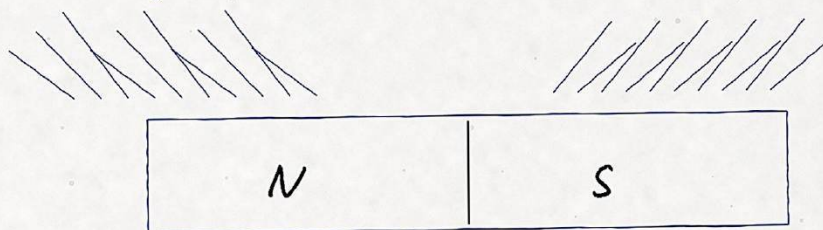
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The two ends of a magnet are called poles.

The poles are named North pole and South pole.

Iron filings collect mostly near the ends because magnetic strength is greatest near the poles.

more iron filings collect near the two ends



Bar magnet has two poles

NCERT anchor: Activity 4.2 iron filings.

No Single Pole

*

A magnet always has two poles, North and South.

If a magnet is broken into pieces, each smaller piece again has both poles.

A single North pole or a single South pole cannot exist alone.

Remember

- * Do not write that breaking gives one N and one S piece
- * Poles always exist in pairs.
- * This is a key exam point.

NCERT anchor: no single magnetic pole.

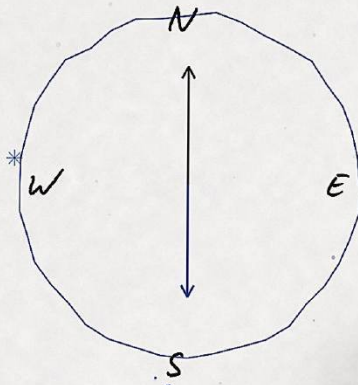
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Finding Directions

A freely suspended bar magnet comes to rest along the north-south direction.

The end pointing towards north is the North-seeking pole, or North pole.

The other end pointing towards south is the South-seeking pole, or South pole.



compass needle rests north-south

NCERT anchor: Activity 4.3 suspended magnet.

Magnetic Compass

A magnetic compass has a small magnetic needle that can rotate freely.

The needle indicates the north-south direction after it comes to rest.

*

Then the compass box is rotated until north and south on the dial align with the needle.

Remember

- * The red end usually marks north.
- * The dial shows all directions.
- * Keep the compass flat and away from strong magnets while using it.

NCERT anchor: Fig. 4.6 magnetic compass.

Make A Compass

An iron sewing needle can be magnetised by stroking it with one pole of a bar magnet.

The same pole must be moved along the needle in the same direction again and again.

The NCERT activity asks us to repeat this 30 to 40 times.

Remember

- * Test the needle with pins or iron filings.
- * Float it through cork on water.
- * It should point in the same direction after rotating.

NCERT anchor: Activity 4.4 Homemade compass.

Matsya Yantra

Long before the modern compass became common, Indians used a similar navigation idea.

A magnetised fish-shaped iron piece was kept in a vessel of oil.

This device was called matsya-yantra or machchh-yantra.

Remember

- * It helped in sea navigation.
- * It is linked with the compass idea.
- * Magnetism helped travellers find directions.

NCERT anchor: matsya-yantra note.

Attraction Between Poles

Unlike poles of two magnets attract each other.

North of one magnet and South of another magnet pull towards each other.

This attraction can move a magnet even without touching it directly.



unlike poles attract



like poles repel

NCERT anchor: Activity 4.5 bar magnets.

Repulsion Between Poles

Like poles of two magnets repel each other.

North-North repels and South-South repels.

Repulsion is the surest way to identify that both objects are magnets.

Remember

- * Iron is attracted by both poles.
- * A magnet can repel another magnet.
- * Use repulsion to find the hidden magnet among metal bars.

NCERT anchor: repulsion identifies magnets.

*

Compass Needle Test

A compass needle is also a magnet.

When North pole of a bar magnet comes near the needle's North pole, the needle moves away.

When South pole comes near the needle's North pole, the needle moves closer.

Remember

- * The compass needle deflects due to magnetic force.
- * Move the bar magnet slowly.
- * Observe direction, not just movement.

NCERT anchor: Activity 4.6 compass needle.

Through Materials

Magnetic effect can act through non-magnetic materials.

NCERT tests wood, cardboard, plastic, and glass between a magnet and compass needle.

There is no appreciable change in deflection with these sheets in between.

Remember

- * Magnetic force can act without contact.
- * A sheet of wood does not block it much.
- * The material itself is non-magnetic.

NCERT anchor: Activity 4.7 material sheets.

Fun With Magnets

Magnets can move some objects without touching them.

A magnet can move steel balls in a cardboard maze from below.

A magnet can help lift a steel paper clip from water without wetting fingers.

Remember

- * Magnetic garland uses attraction.
- * Matchbox cars can attract or repel.
- * Fun activities still need careful handling.

NCERT anchor: Fig. 4.11 to Fig. 4.14.

Keep Magnets Safe

Magnets should be stored properly so that they do not become weak.

Store bar magnets in pairs with unlike poles on the same side.

Keep a wooden piece between them and soft iron pieces across the ends.

store safely

keep unlike poles together

use soft iron keepers

place wood between magnets

* avoid damage

do not heat

do not hammer

keep away from phones

NCERT anchor: safe magnet storage box.

Keywords Page

Bar magnet, U-shaped magnet, and ring magnet are common magnet shapes.

Attraction means pulling together. Repulsion means pushing away.

Magnetic compass, magnetic materials, and non-magnetic materials are must-know terms.

Remember

- * North pole and South pole must be written clearly.
- * Observe, record, predict, and conclude are activity words.
- * Use exact NCERT terms in answers.

NCERT anchor: keywords list.

Exercise: Blanks

Unlike poles of two magnets attract each other, whereas like poles repel each other.

Materials attracted towards a magnet are called magnetic materials.

A magnetic compass needle rests along the north-south direction.

Remember

- * A magnet always has two poles.
- * Do not write east-west for compass needle.
- * Use attract and repel in the correct blank.

NCERT anchor: exercise Q1.

Exercise: True False

A magnet cannot be broken to obtain a single pole, so that statement is false.

Similar poles repel each other, so that statement is true.

Iron filings mostly stick near the ends, not the middle, so that statement is false.

Remember

- * A suspended bar magnet aligns north-south true.
- * Read each statement slowly.
- * Correct the false statement in your rough work.

NCERT anchor: exercise Q2.

Pole Reasoning

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For N-N, interaction is repulsion.

For N-S and S-N, interaction is attraction.

For S-S, interaction is repulsion.

Remember

- * Like poles repel.
- * Unlike poles attract.
- * This one rule solves many pole questions.

NCERT anchor: exercise Q3.

Steel Clips Question

A bar magnet rolled over steel U-clips attracts most clips near its two ends.

Very few clips stick near the middle region.

So positions near both poles should show larger numbers than the centre.

Remember

- * Choose the option with high counts at A and C.
- * Position B is near the middle.
- * This tests pole strength

NCERT anchor: exercise Q4.

Three Metal Bars

To identify two magnets among three metal bars, use the property of repulsion.

Bring ends of two bars close in different combinations.

If two ends repel, both bars are magnets and those ends are like poles.

Remember

- * Attraction alone is not enough proof.
- * Iron can be attracted by both poles.
- * Repulsion confirms magnet-magnet interaction.

NCERT anchor: exercise Q5.

Unmarked Magnet

Use a marked magnet to find poles of an unmarked magnet.

Bring the marked North pole near one end of the unmarked magnet.

If it repels, that end is North. If it attracts, that end is South.

Remember

- * Repeat with the other end to confirm.
- * Label lightly after testing.
- * Keep magnets from snapping together.

NCERT anchor: exercise Q6.

Find North Without Magnet

Suspend the unmarked bar magnet freely with a thread tied near its middle.

Let it come to rest and note the end pointing towards north.

That end is the North pole of the magnet.

Remember

- * Use sunrise or sunset for rough direction.
- * Repeat the rotation once or twice.
- * Only magnets repeatedly settle north-south.

NCERT anchor: exercise Q7.

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Earth As A Magnet

Earth behaves like a giant magnet, so a compass needle aligns along north-south.

The north-seeking end of the compass points towards geographic north.

*

So Earth's magnetic South pole lies near geographic north, and magnetic North lies near geographic south.

Remember

- * This answers exercise Q8.
- * Do not overcomplicate it with higher-class field details.
- * Use compass observation as evidence.

NCERT anchor: exercise Q8.

Magnetic Screwdriver

— If steel screws keep falling, magnetise the screwdriver tip.

Stroke the screwdriver tip with one pole of a strong bar magnet several times in one direction.

— Then the screwdriver can attract and hold small steel screws while working.

Remember

- * This uses the needle magnetising idea.
- * Steel screws are magnetic materials.
- * This answers exercise Q9.

NCERT anchors exercise Q9.

Ring Magnets

- In the ring-magnet question, magnet X does not move down because like poles face each other.

The repulsion balances the downward push so X appears to float above Y.

To bring X in contact with Y, turn one magnet upside down so unlike poles face each other.

Remember

- * This answers exercise Q10.
- * Like poles repel.
- * Unlike poles attract.

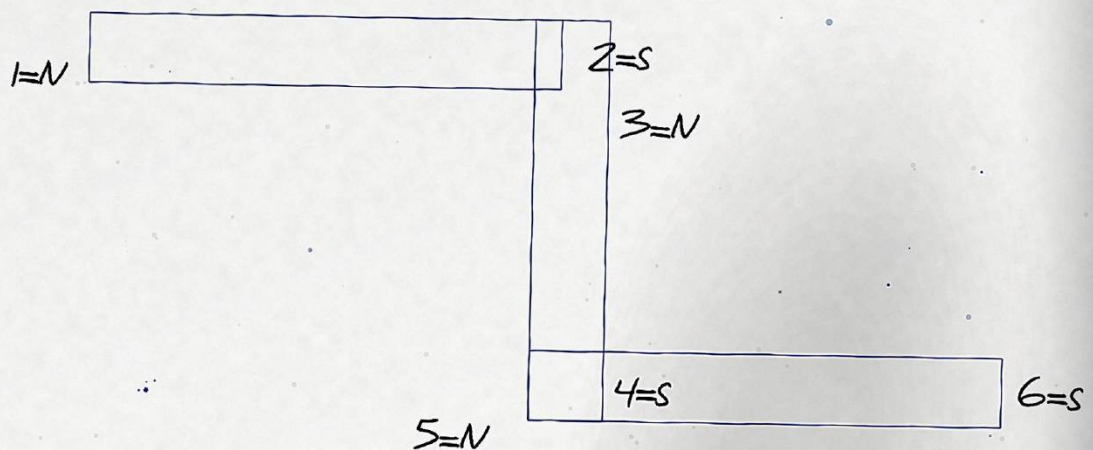
NCERT anchor: exercise Q10.

Three Magnet Poles

For the three-magnet shape, use only one rule: unlike facing ends attract and like facing ends repel.

Start from given end $5 = N$, so the other end of that bottom magnet is $6 = S$.

The final labels are $1 = N$, $2 = S$, $3 = N$, $4 = S$, and $6 = S$.



Answer: $1=N$, $2=S$, $3=N$, $4=S$, $6=S$

NCERT anchor: exercise Q11.

Revision Map

Magnetic materials are attracted by magnets, while non-magnetic materials are ^{*}not.

*

Magnets have two poles and the poles always exist in pairs.

A compass works because a freely suspended magnet rests north-south.

Remember

- * Like poles repel and unlike poles attract.
- * Magnetic effect can pass through non-magnetic sheets.
- * Store magnets carefully to protect their strength.

NCERT anchor: chapter summary.

Common Mistakes

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Do not say all metals are magnetic. Many common metals are not attracted strongly by magnets.

Do not say the centre of a bar magnet is strongest. The ends are strongest.

Do not use attraction alone to identify a magnet, because iron can also be attracted.

Remember

* :

- * Write north-south, not north-east.
- * A compass needle is itself a magnet.
- * Single magnetic poles do not exist.

NCERT anchor: common exam errors.