

Q1.(2018)

a)

Figure 3 shows two paper clips hanging from a bar magnet.

Figure 3



The paper clips have become magnetised.

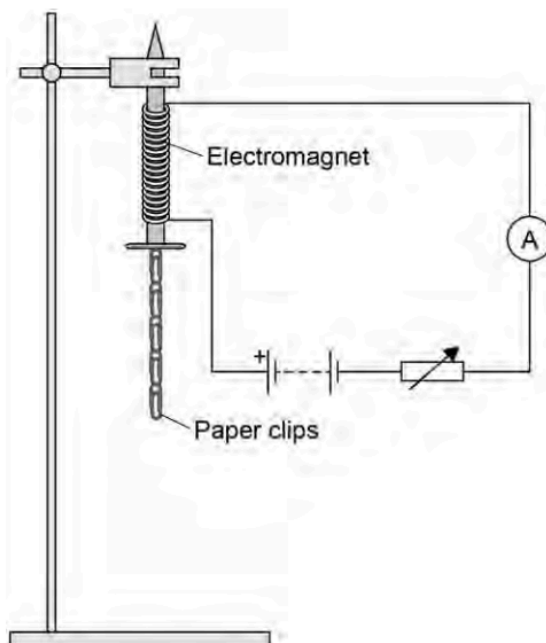
Label the north and south poles of both paper clips.

[1 mark]

A student investigated how the number of turns of wire on an electromagnet affects the strength of the electromagnet.

Figure 4 shows the equipment used by the student. Throughout the investigation the student kept the current through the wire constant.

Figure 4



b)

The student measured the strength of the electromagnet by counting the number of paper clips the electromagnet could hold.

Explain why it was important that the paper clips were all the same size.

[2 marks]

c)

Table 2 shows the student's results.

Table 2

Number of turns of wire on the electromagnet	Number of paper clips held
10	3
20	6
30	9
40	12

Describe the pattern shown in **Table 2**.

[2 marks]

d)

The student then used 50 turns of wire on the electromagnet.

The electromagnet picked up 18 paper clips. This was more paper clips than the student had expected.

Which **one** is the most likely cause of this result?

Tick **one** box.

[1 mark]

The paper clips used with 50 turns were larger than the others.

☐

There were less than 50 turns of wire on the electromagnet.

☐

Some of the paper clips were already magnetised.

☐

e)

The student repeated the measurement for 50 turns of wire three more times.

This gave her the following set of results.

18 16 14 15

Explain what the student should now do with the **four** results for 50 turns of wire.

[3 marks]

f)

The student wrote the hypothesis:

'Increasing the current through the wire will make the electromagnet stronger.'

Describe how the student should change the investigation to test this hypothesis.

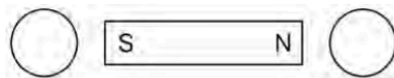
[3 marks]

Q2.(2019)

Figure 5 shows a bar magnet.

Each circle represents a compass.

Figure 5



Draw an arrow inside each circle to show the direction that each compass would point.

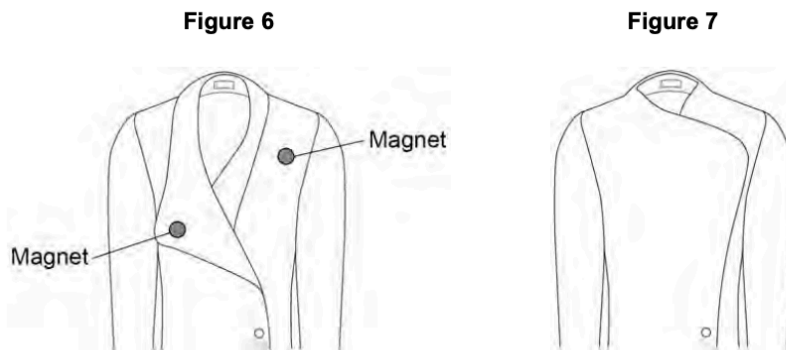
[1 mark]

Q3.(2019)

Figure 6 shows part of a coat.

The coat has two magnets hidden inside the material.

Figure 7 shows how the magnets are used to fasten the coat.



Explain why the magnets inside the coat must **not** have two south poles facing each other.

[2 marks]

Q4.(2019)

a)

A coil of wire is connected to a battery.

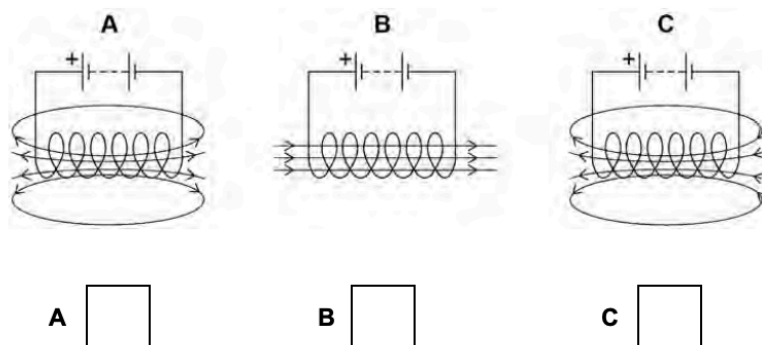
The current in the coil produces a magnetic field.

Which diagram in **Figure 8** shows the magnetic field produced by the current in the coil?

[1 mark]

Tick (✓) **one** box.

Figure 8



b)

A solid rod is placed inside the coil.

Which type of rod would make the magnetic field of the coil stronger?

[1 mark]

Tick (✓) **one** box.

Glass rod	☐
Plastic rod	☐
Steel rod	☐
Wooden rod	☐

Q5.(2020)

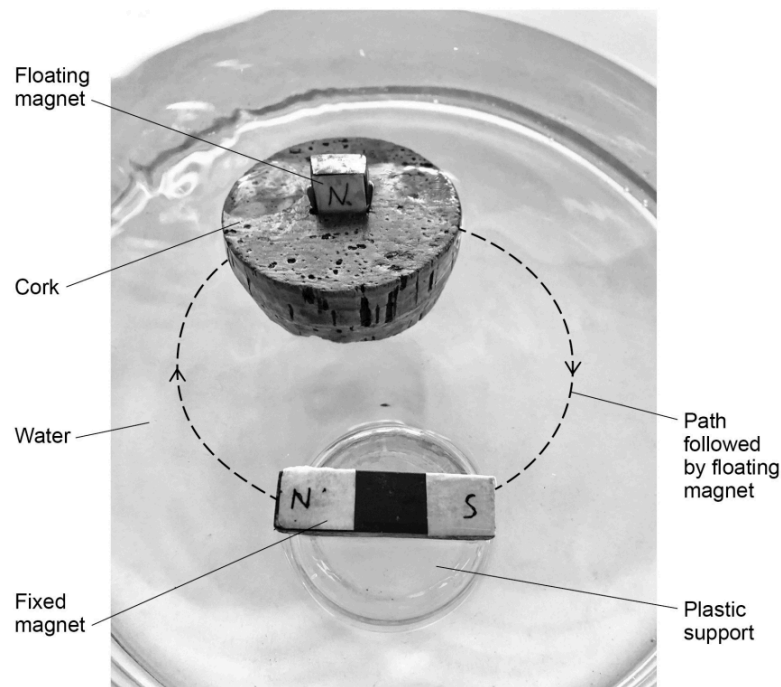
a)

A student placed a magnet on top of a plastic support in a bowl of water. This magnet was fixed in position and above the surface of the water.

The student put a second magnet into a piece of cork so that the magnet floated on the water. Only the north pole of the floating magnet was above the surface of the water.

Figure 6 shows the arrangement of the magnets.

Figure 6



The floating magnet was placed near to the north pole of the fixed magnet. The floating magnet then moved along the path shown in **Figure 6**.

Explain why.

[2 marks]

b)

The student replaced the floating magnet with a piece of iron.

What happened to the piece of iron?

[1 mark]

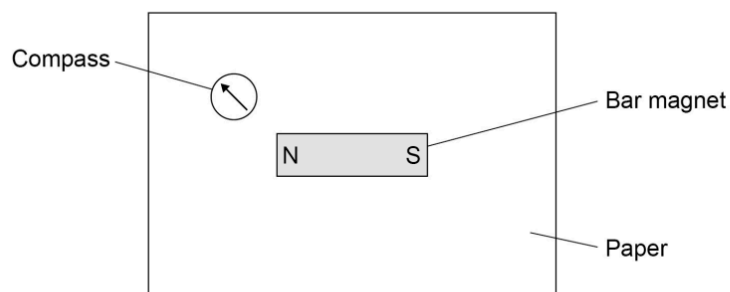
c)

Describe how to use a compass to plot the magnetic field pattern around a bar magnet.

Use **Figure 7** to help you.

[4 marks]

Figure 7

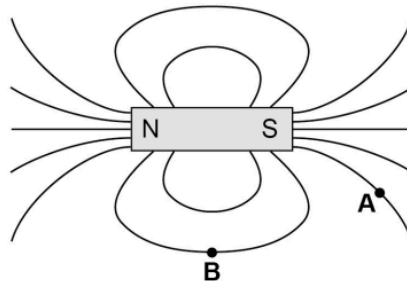


Q6.(2021)

a)

Figure 16 shows the magnetic field pattern around a bar magnet.

Figure 16



Draw an arrow at point **A** and point **B** to show the direction of the magnetic field at each point.

[1 mark]

b)

A bar magnet produces its own magnetic field.

Complete the sentence.

Choose the answer from the box.

[1 mark]

an electromagnet an induced magnet a permanent magnet

A bar magnet is an example of _____.

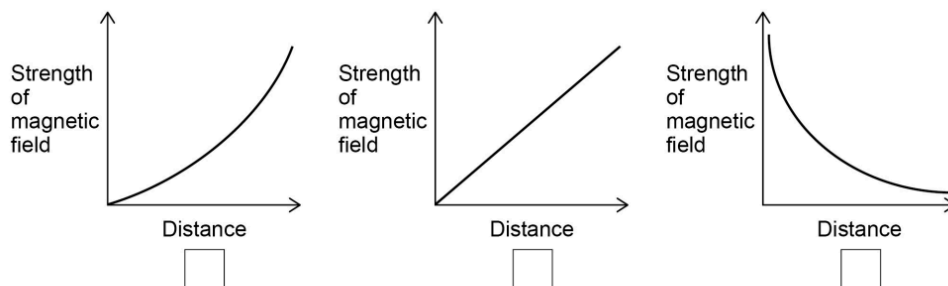
c)

Which graph shows how the strength of the magnetic field varies with distance from the bar magnet?

Give a reason for your answer.

[2 marks]

Tick (✓) **one** box.



Reason _____

Q7.(2022)

When two magnets are close together they exert a force on each other.

Complete **Table 1** to show if the magnets would attract or repel.

[2 marks]

Tick (✓) **one** box in **each** row.

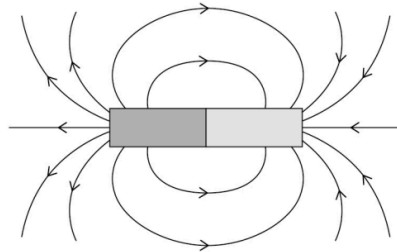
Table 1

		Attract	Repel
			
			
			
			

Q8.(2022)

Figure 1 shows the magnetic field around a bar magnet.

Figure 1



Which statements are true for the magnetic field shown in **Figure 1**?

[2 marks]

Tick (✓) **two** boxes.

The magnetic field gets weaker further from the magnet.

☐

The magnetic field is strongest at the poles.

☐

The magnetic field is uniform away from the poles.

☐

The magnetic field lines all meet at a single point.

☐

The magnetic field lines point from south to north.

☐

Q9.(2024)

Some metals are magnetic and others are non-magnetic.

Which of the following metals is magnetic?

[1 mark]

Tick (✓) **one** box.

Aluminium

☐

Cobalt

☐

Copper

☐

Zinc

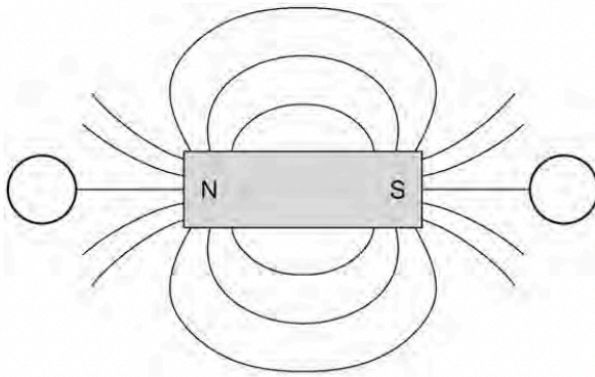
☐

Q10.(2024)

Figure 1 shows magnetic field lines around a bar magnet.

The circles represent plotting compasses.

Figure 1



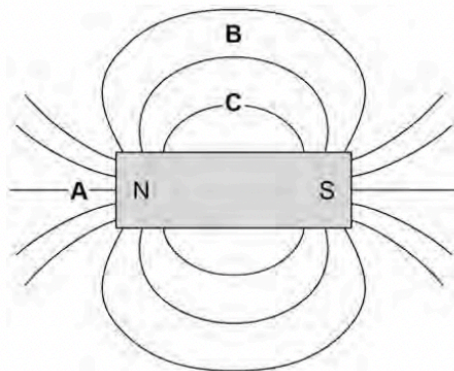
Draw **one** arrow in each circle on **Figure 1** to show the direction of the magnetic field at each place.

[2 marks]

Q11.(2024)

Figure 2 shows magnetic field lines around a bar magnet.

Figure 2



Which letter shows where the magnetic field is strongest?

[1 mark]

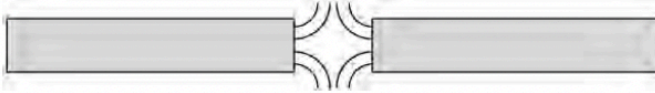
Tick (✓) **one** box.

A	☐	B	☐	C	☐
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Q12.(2024)

Figure 3 shows the magnetic field lines between two bar magnets.

Figure 3



Which diagram shows how the magnets are arranged in **Figure 3**?

[1 mark]

Tick (✓) **one** box.

S	N	☐
S	S	☐
N	S	☐