



KS3 Science

Magnetism

Question Paper



Time available: 22 minutes

Marks available: 34 marks

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1.

David put two bars of iron close to each other.
There was **no** magnetic force between them.
David recorded the result as shown below.

bar of iron			result
		attract	<input type="checkbox"/>
bar of iron			repel <input type="checkbox"/>
		no magnetic force	<input checked="" type="checkbox"/>



(a) David did three other tests.
Tick the correct box to show the result for each test.

(i)

bar of copper			result
		attract	<input type="checkbox"/>
bar magnet			repel <input type="checkbox"/>
		no magnetic force	<input type="checkbox"/>



1 mark

(ii)

bar of iron			result
		attract	<input type="checkbox"/>
bar magnet			repel <input type="checkbox"/>
		no magnetic force	<input type="checkbox"/>

1 mark

(iii)

bar of steel		result
		attract <input type="checkbox"/>
bar magnet		repel <input type="checkbox"/>
		no magnetic force <input type="checkbox"/>



1 mark

(b) David then did two experiments with magnets.

The tick in each box shows David's results in each experiment.



Label the missing poles on **each** magnet to match David's results.

(i)

bar magnet		result
		attract <input type="checkbox"/>
		repel <input checked="" type="checkbox"/>
bar magnet		no magnetic force <input type="checkbox"/>

1 mark

(ii)

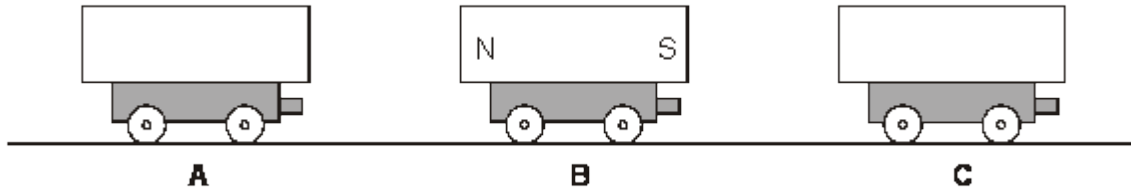
bar magnet		result
		attract <input checked="" type="checkbox"/>
		repel <input type="checkbox"/>
bar magnet		no magnetic force <input type="checkbox"/>

1 mark
maximum 5 marks

2. The diagram below shows three trolleys.
Peter put a bar magnet on each trolley.

(a) He pushed trolleys A, B and C together.

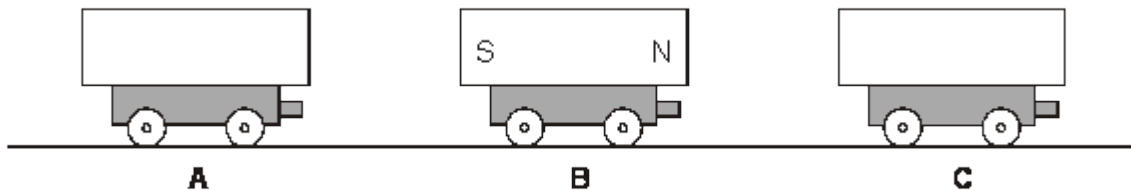
- Magnet B **attracted** magnet A.
- Magnet B **repelled** magnet C.



On the diagram above, label the north and south poles of magnets A and C.
Use the letters N and S.

2 marks

(b) Peter turned trolley B around. Trolleys A and C were **not** turned around.



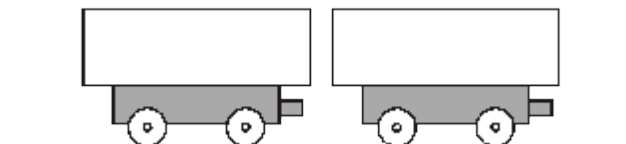
What would happen now when Peter pushed them all together?
Use either **attract** or **repel** to complete each sentence below.

Magnet B would magnet A.

Magnet B would magnet C.

1 mark

(c) Peter held two trolleys close together and then let go.



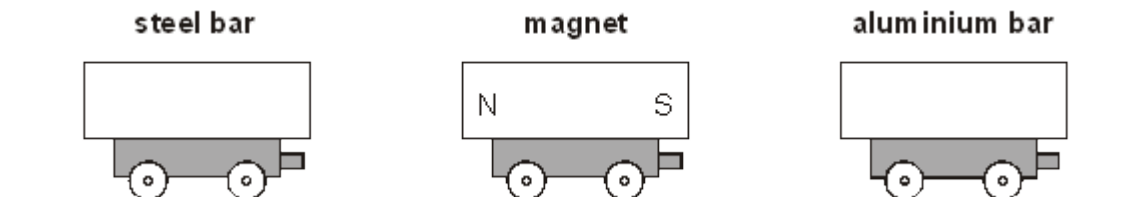
The magnets repelled each other.

Draw an arrow on both magnets to show which way they would move.

1 mark

(d) Peter took a magnet, a steel bar and an aluminium bar.

He put them on three trolleys as shown below.



(i) What happens to the steel bar as he moves it closer to the magnet?

.....

1 mark

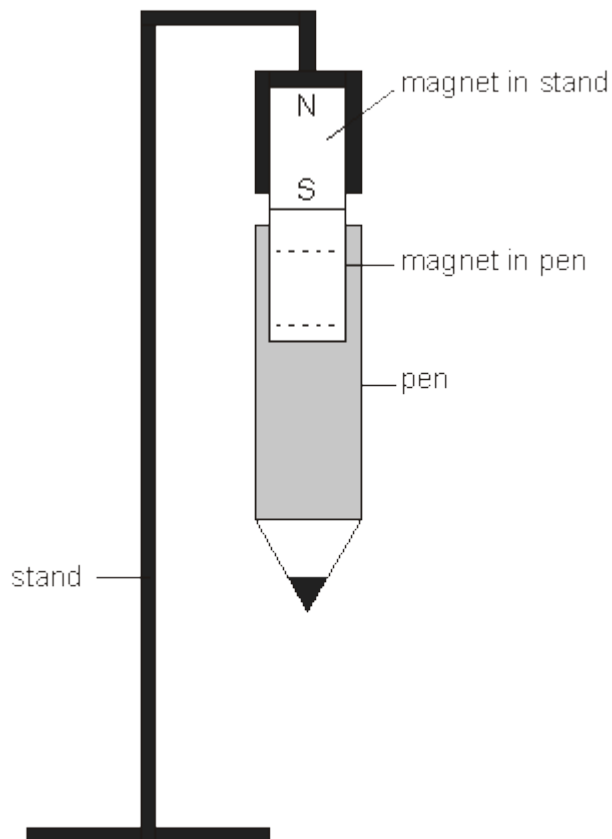
(ii) What happens to the aluminium bar as he moves it closer to the magnet?

.....

1 mark
maximum 6 marks

3. The diagram below shows a pen.

The pen is held up by two magnets, one in the stand and the other in the pen.

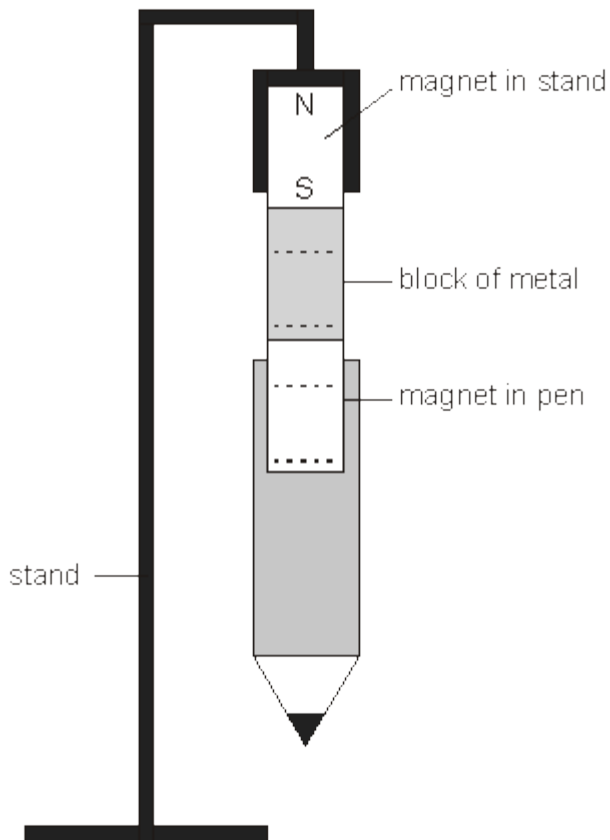


- (a) **On the dotted lines above**, label the North pole and the South pole of the magnet in the pen.

Use the letters N and S.

1 mark

- (b) John put a block of metal between the two magnets as shown below.



The block of metal became a magnet.

- (i) **On the dotted lines above**, label the North poles and the South poles of both the block of metal **and** the magnet.

Use the letters N and S.

1 mark

- (ii) What metal could the block be made of?

.....

1 mark

- (c) John repeated the experiment using a piece of wood instead of a block of metal. The pen did **not** stay up. Give the reason for this.

.....

1 mark

maximum 4 marks

4.

- (a) Debbie put a paper cup into a glass beaker. She glued a magnet in the bottom of the paper cup. She glued another magnet in the bottom of the beaker. The magnets repelled.

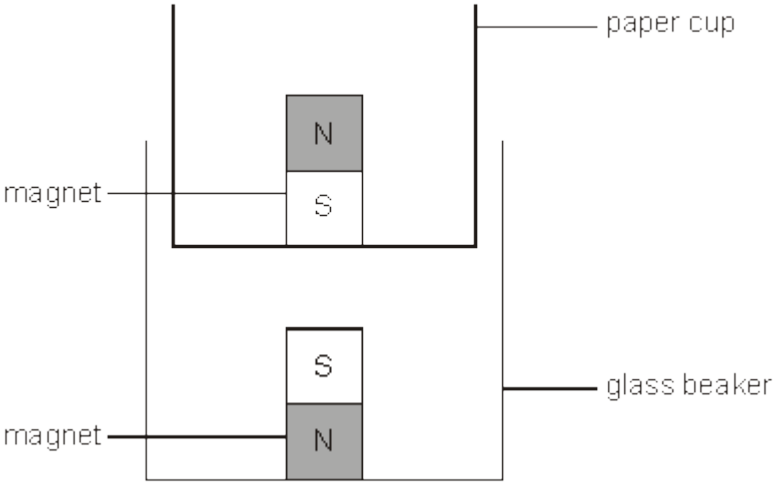


diagram A

not to scale

What **two** forces act on the paper cup and its contents to keep it in this position?

- 1.
- 2.

1 mark

1 mark

- (b) Debbie put 5 g of aluminium rivets into the paper cup. It moved down a little as shown in diagram B.

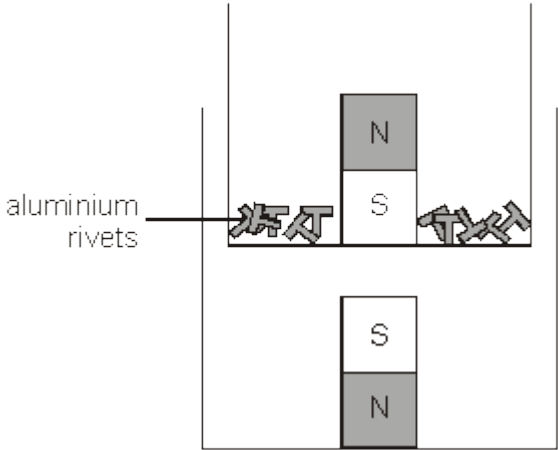
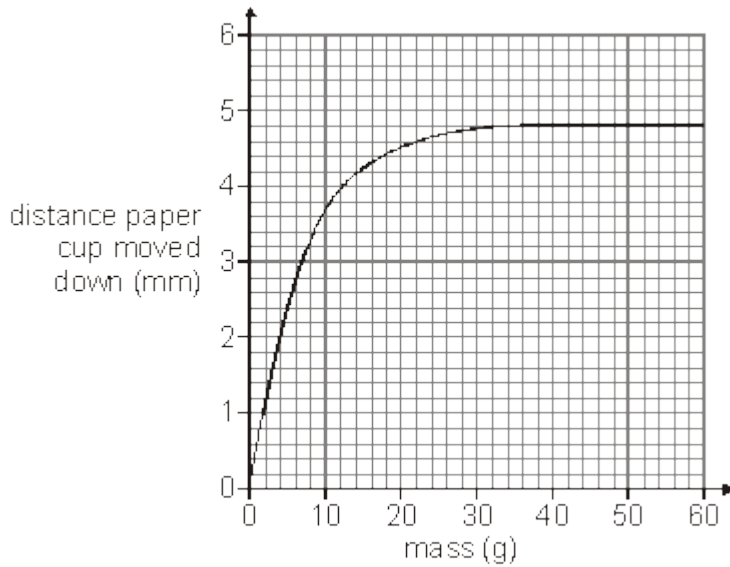


diagram B

not to scale

Debbie plotted a graph to show how the mass of aluminium rivets affected the distance the cup moved down.



(i) Use the graph to find the mass that made the cup move down 4 mm.

..... g

1 mark

(ii) Why did the graph stay flat with masses greater than 40 g?

.....

1 mark

(c) Debbie removed the 5 g of aluminium rivets and put 5 g of iron nails into the cup.

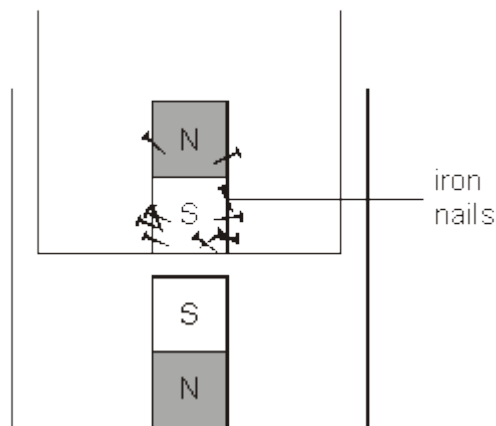


diagram C

not to scale

The paper cup moved down more with 5 g of iron nails than with 5 g of aluminium rivets as shown in diagram C.

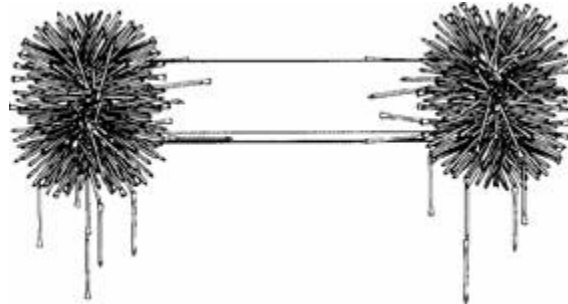
Give the reason for this.

.....
.....

1 mark
maximum 5 marks

5.

Paulo drops a bar magnet into a box of nails. When he picks the magnet up, some nails are sticking to the ends.



(a) What material are the nails made from?

.....

1 mark

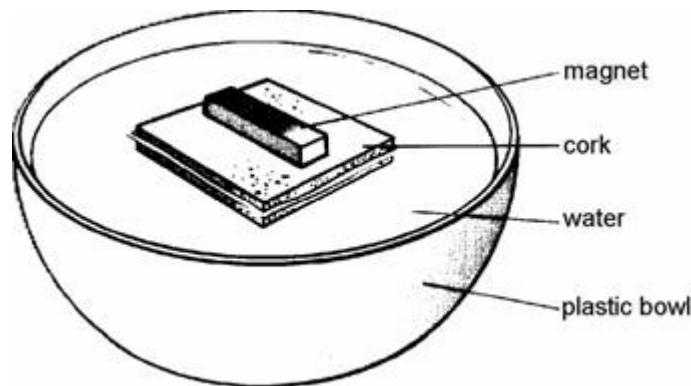
(b) The nails stick to the ends of the bar magnet but not to the middle. Why do the nails stick to the **ends** of the magnet?

.....

.....

1 mark

(c) Paulo puts a magnet on a piece of cork. He floats the cork on water in a plastic bowl, and spins it round slowly.



When the cork stops spinning, in which direction will the magnet point?

.....

1 mark

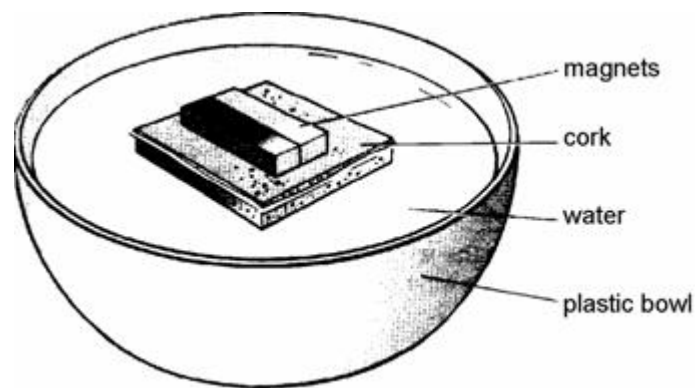
- (d) Paulo takes a second, identical bar magnet. The two magnets stick together as shown. One of the poles has been labelled on the drawing.



- (i) Label the other three poles.

1 mark

- (ii) Paulo puts the two magnets on the piece of cork. He floats the cork on the water in the plastic bowl, and again spins it round slowly.



In which direction will the magnets point at the end of the experiment?
Tick the correct box.

In a north-south direction.

In an east-west direction.

Could be in any direction.

The cork does not stop spinning.

1 mark
Maximum 5 marks

6. (a) The diagram shows two bar magnets.



The north pole and south pole are shown on magnet A. The poles are not shown on magnet B.

Describe an experiment you could do, using magnet A, to find which end of magnet B is the north pole **and** which is the south pole.

.....

.....

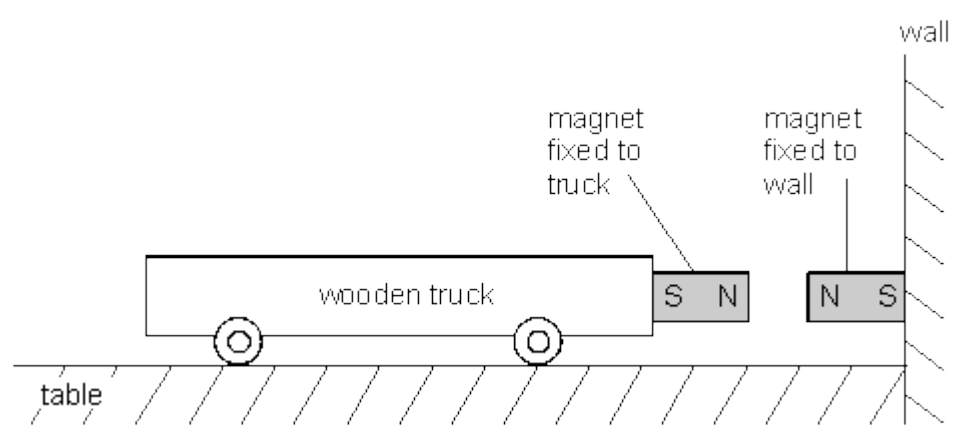
.....

.....

.....

3 marks

(b) The diagram shows a wooden truck near a wall. There is a strong magnet fixed to the wall and a strong magnet fixed to the front of the wooden truck.



James holds the wooden truck so that it does not move. Then he lets go of the wooden truck. In which direction will it move?

.....

1 mark

- (c) James removes the magnet from the wooden truck. He gives the truck a push so that it rolls along the table.

What effect will friction have on the speed of the truck as it rolls along?

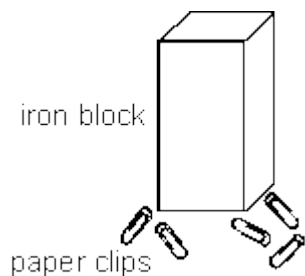
.....

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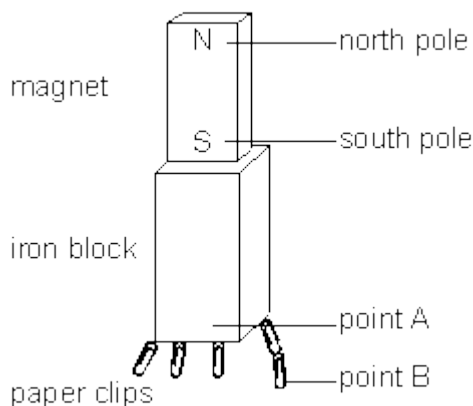
1 mark
Maximum 5 marks

7.

An iron block is near some steel paper clips. The paper clips do not stick to the iron block.



A pupil puts a magnet on top of the iron block. The paper clips stick to the iron block and to each other.



- (a) What are the magnetic poles at points **A** and **B** in the diagram?
Put **one** tick in each row in the table.

	north pole	south pole	no magnetic pole
point A			
point B			

2 marks

- (b) (i) The sentences below are about the force which the magnet exerts on the iron block.

Tick the box by the **one** correct sentence.

The magnet attracts the iron block.

The magnet repels the iron block.

There is no magnetic force on the iron block.

1 mark

- (ii) The sentences below are about the force which the magnetised iron block exerts on the magnet.

Tick the box by the **one** correct sentence.

The iron block attracts the magnet.

The iron block repels the magnet.

There is no magnetic force on the magnet.

1 mark

Maximum 4 marks