Sc

KEY STAGE
2

LEVELS
3–5

2009

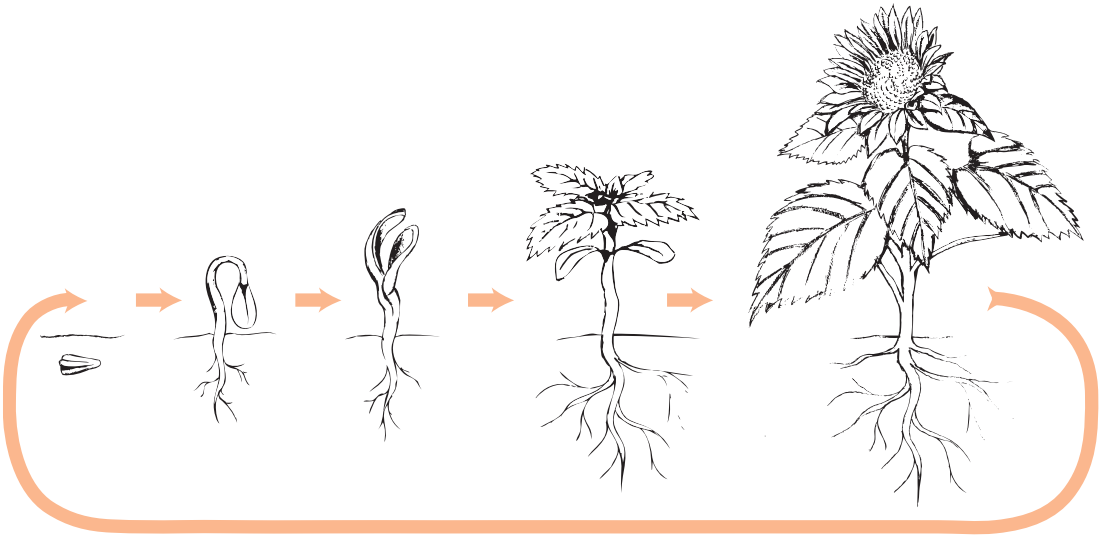
Science test

Test B

First name _____

Last name _____

School _____



For marker's use only

Page	Marks
5	
7	
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13	
15	
17	
19	
21	
TOTAL	

INSTRUCTIONS

Read this carefully.

You have **45 minutes** for this test.

Answers

This pencil shows where you will need to put your answer.

For some questions you may need to draw an answer instead of writing one.

Some questions may have a box like this for you to write down your thoughts and ideas.

1

Making soup

(a) Fahim is making some soup.

He measures some cold water into a glass measuring jug.

Glass is a good material for a measuring jug, even though glass can break easily.

Why is glass a good material for a measuring jug?

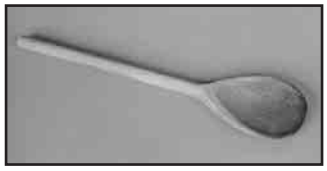
1a

1 mark

.....

(b) Fahim cuts some vegetables. He puts them into a saucepan. He adds the water to make soup.

He uses a wooden spoon to stir the soup while it cooks.



Why is wood a good material for the spoon that Fahim uses to stir the hot soup?

Tick **ONE** box.

It gets hot. ☐

It conducts heat away from his hand. ☐

It insulates his hand from the heat. ☐

It absorbs hot water. ☐

1b

1 mark

(c) Fahim cooks the soup in a metal saucepan.

Fahim gives one reason why saucepans are made from metal, not plastic:

Metal conducts heat well.

Give **ONE other** reason why saucepans are usually made from metal and **not** from plastic.

.....

.....

1c

1 mark

(d) Fahim washes up his cooking things. His washing-up bowl is made from plastic.

He gives two reasons why washing-up bowls are made of plastic:

Plastic does **not** conduct heat well. Plastic is cheap.

Give **ONE other** reason why plastic is a good material for a washing-up bowl.

.....

.....

1d

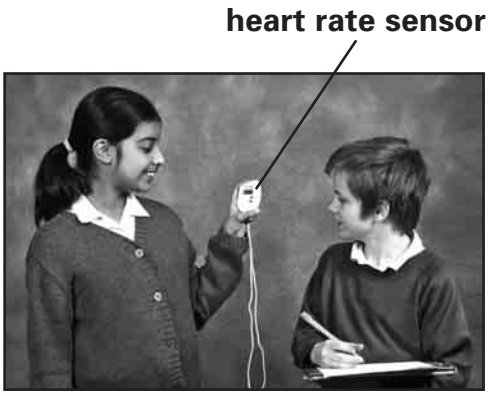
1 mark

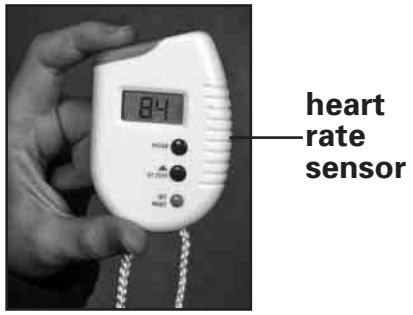
Total out of 4

2

Heart rate

(a) James and Alice investigated a report that said when people chew gum, their heart rate increases.





They measured the heart rate of five children at rest.
Next they measured the heart rate of each child as they chewed gum.

Why did James and Alice measure the children's heart rate when they were resting?

.....

.....

2a

1 mark

(b) The table below shows the heart rates of the five children.

Child	At rest (beats per minute)	After chewing gum for 1 minute (beats per minute)
Robert	84	94
Emma	84	86
Carol	96	104
Samantha	96	101
Eshe	83	100

Look at the table.

Which part of their investigation was presented in the table?

Tick **ONE** box.

questions	☐	results	☐
plans	☐	ideas	☐

☐ 2b
1 mark

(c) What variable did the children measure?

.....

☐ 2c
1 mark

(d) Alice's evidence agrees with the report.
She said, 'When they chew gum, the children's heart rate increases.'

Use the data **in the table** to describe how the evidence supports Alice's conclusion: 'When they chew gum, the children's heart rate increases.'

.....

.....

☐ 2d
1 mark

(e) James wondered if it was the **gum** or the **chewing** that caused the increase in heart rate.

How could James check whether it was the **gum** or the **chewing** that caused the increase in heart rate?

.....

.....

☐ 2e
1 mark

Total out of 5 ☐

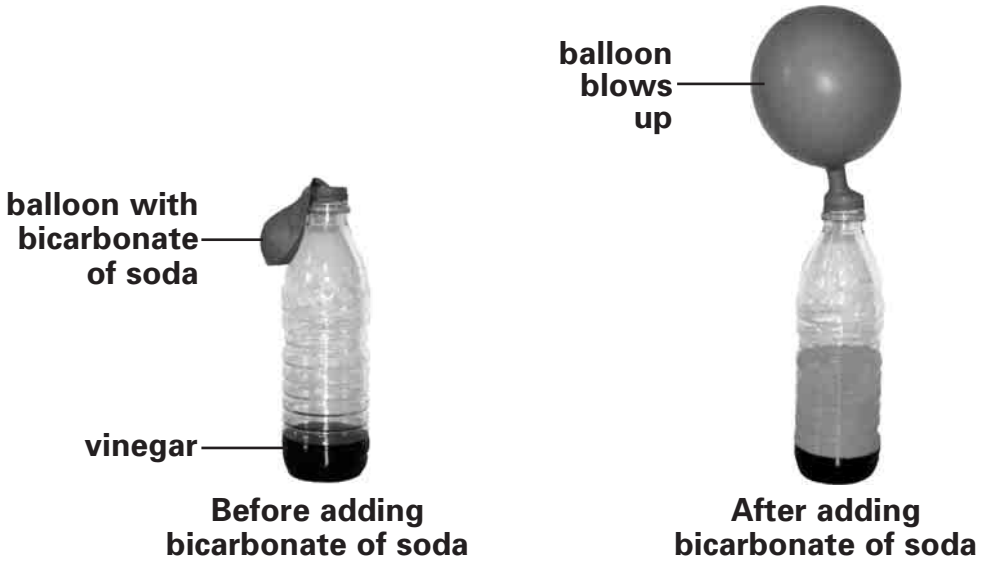
3

Mixing and observing

(a) Marcel is mixing bicarbonate of soda with vinegar.

Look at Marcel's plan

1. Pour vinegar into a bottle.
2. Put bicarbonate of soda into a balloon.
3. Put the balloon over the top of the bottle, but do not let the bicarbonate of soda fall into the vinegar.
4. Add the bicarbonate of soda from the balloon to the vinegar.



Which **TWO** properties of the balloon make it a good material to put over the top of the bottle?

Tick **TWO** boxes.

smooth	☐	opaque	☐
flexible	☐	stretchy	☐

☐ 3a
1 mark

(b) What is produced that makes the balloon blow up when bicarbonate of soda and vinegar are mixed?

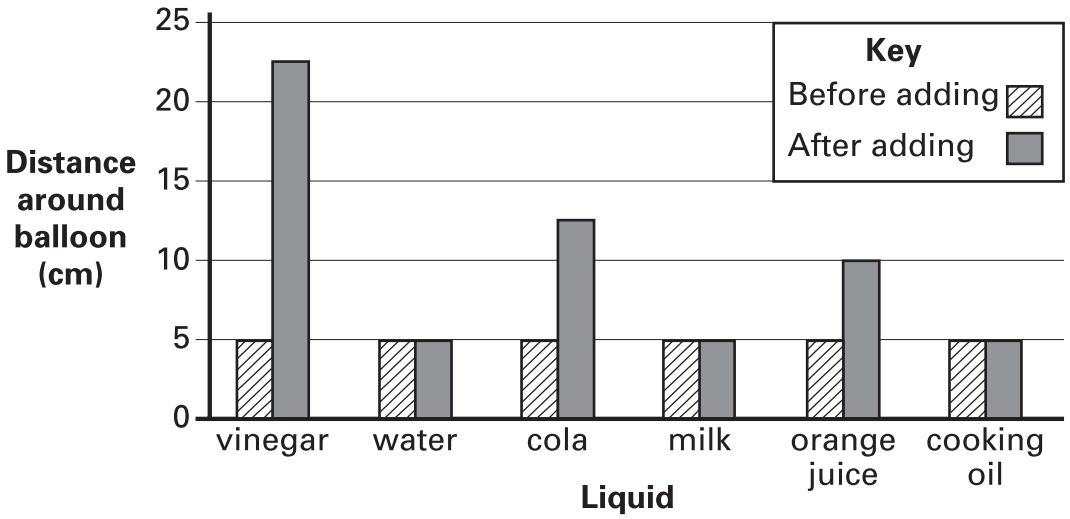
.....

☐ 3b
1 mark

(c) Marcel repeats his test using different liquids in the bottle.

He measures around each balloon before and after adding bicarbonate of soda into the liquid.

He draws a graph of his results.



Use the graph to answer the questions below.

(i) Name **TWO** liquids that did **not** cause the balloon to blow up.

..... and .....

3ci
1 mark

(ii) Describe how the height of the bars on the graph show which balloons did **not** blow up at all.

.....

.....

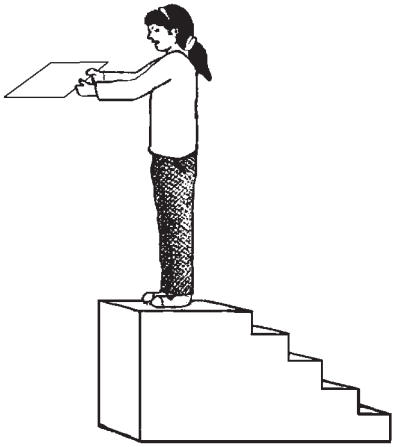
3cii
1 mark

Total out of 4

4

Falling paper

(a) Rosie stands on some steps.
She holds a piece of paper like this:



Rosie lets go of the paper.
Luke times how long it takes for the paper to land flat on the floor.

Tick **ONE** box to show how the force of gravity acts on the paper.

The force of gravity...

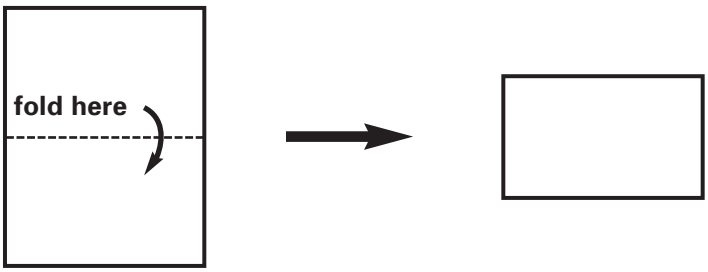
pushes downwards.	☐	pulls downwards.	☐
pushes upwards.	☐	pulls upwards.	☐

☐ 4a
1 mark

(b) Rosie folds the paper in half.
She drops the paper again and Luke times it.

They repeat the test, folding the paper in half each time.
They measure the area each time they fold the paper.

Fold 1



Fold 2

Fold 3

In the table below they record the time it takes for different pieces of paper to fall to the floor.

Number of times we folded the paper in half	0	1	2	3
Area of the paper (cm^2)	600	300	150	75
Time taken for the paper to land flat on the floor (seconds)	2.6	1.7	1.3	1.0

How many times did they fold the paper that fell fastest?

..... 4b 1 mark

(c) Describe the link between the **area** of paper and the **time taken** to land.

.....

..... 4c 1 mark

(d) The children have some ideas to explain why the paper fell at different speeds. Only **ONE** idea is correct.

Carlton

The folded paper is heavier than the unfolded paper.

Tasha

There is more friction on the folded paper.

Rosie

Gravity is stronger on the folded paper.

Luke

There is less air resistance on the folded paper.

Whose idea is correct?

..... 4d 1 mark

Total out of 4

5 Shadows and space

(a) Jimmy stands a pole in the playground.
There is a shadow of the pole on the playground.

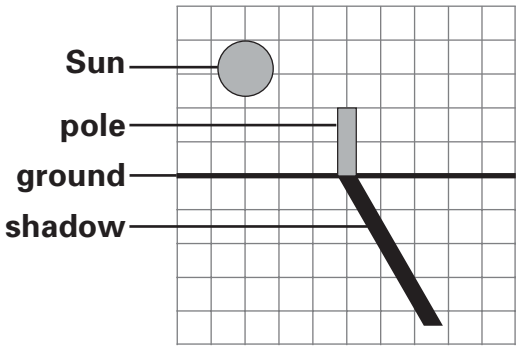
Why does the pole cause a shadow on the playground?

5a
1 mark

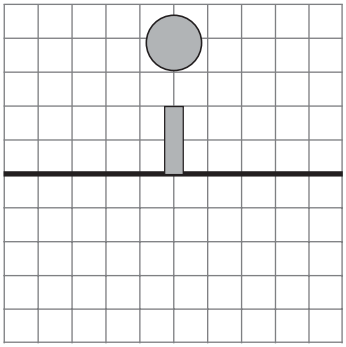
.....

(b) Jimmy records the shadow at 10 am.

He draws his results on squared paper.



Draw the shadow of the pole at 12 noon.



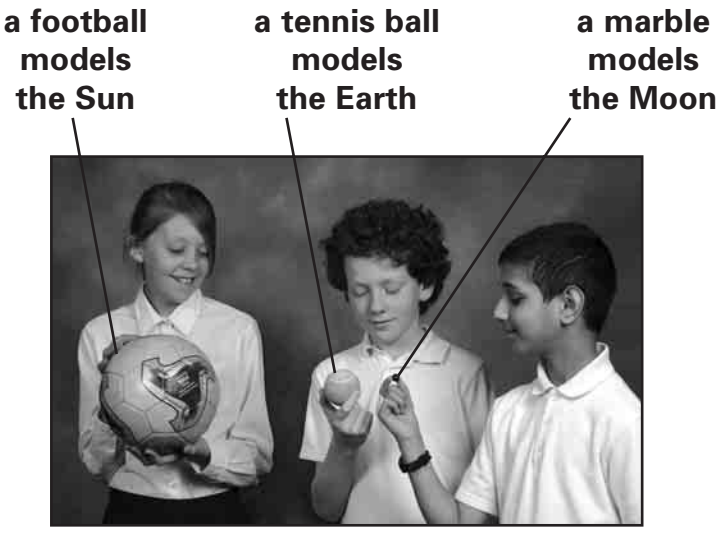
5b
1 mark

(c) **Tick ONE box to show which movement in space causes the shadows to change on Earth during a day.**

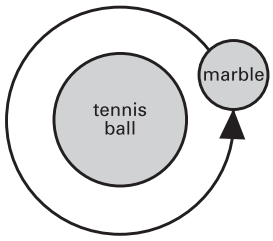
the Sun spinning	☐	the Earth orbiting the Sun	☐
the Earth spinning	☐	the Moon orbiting the Earth	☐

5c
1 mark

(d) Jimmy and his friends use different sized balls to model the Sun, Earth and Moon.



The marble is moved around the tennis ball.



Which movement is modelled by the marble and the tennis ball?
Tick **ONE** box.

the Moon orbiting the Earth	☐	the Earth orbiting the Moon	☐
the Moon spinning on its axis	☐	the Earth spinning on its axis	☐

☐ 5d
1 mark

(e) The children use the tennis ball and the football to model an orbit. This orbit takes one year.

How should the children move the tennis ball and the football to model the orbit that takes one year?

.....

.....

☐ 5e
1 mark

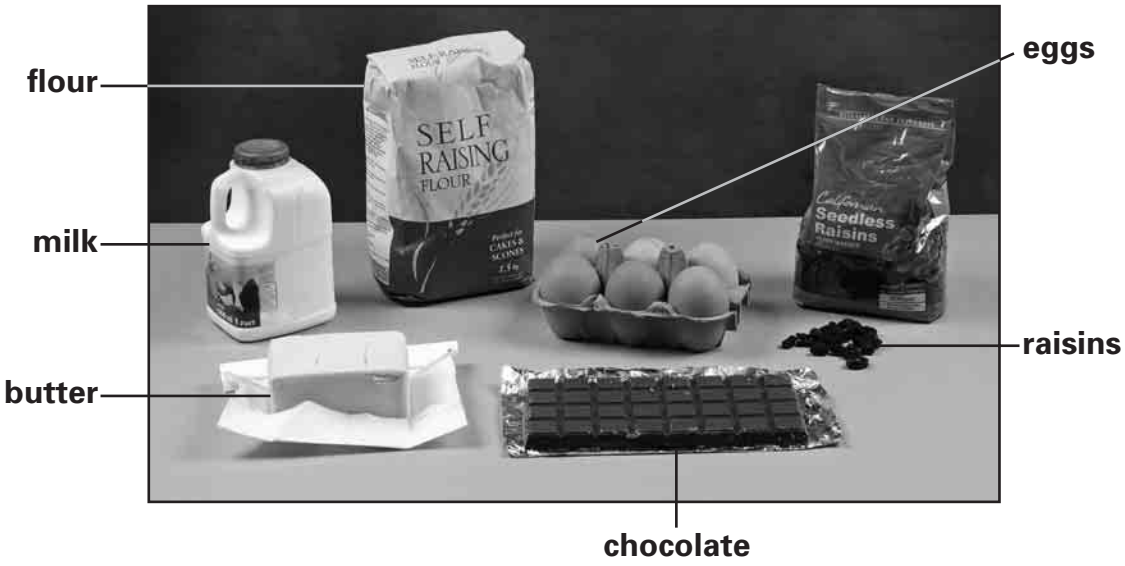
Total out of 5 ☐

6

Cakes

(a) Jacob makes some cakes for an investigation.

These are some of the ingredients he uses.



Which **TWO** ingredients in the picture are solid at room temperature, but **change** to liquid when they are heated?

1. .....

2. .....

6a
1 mark

(b) Jacob mixes the ingredients and cooks the cakes in the oven.

He cuts one of the cooked cakes in half.

He sees small spaces inside the cake.

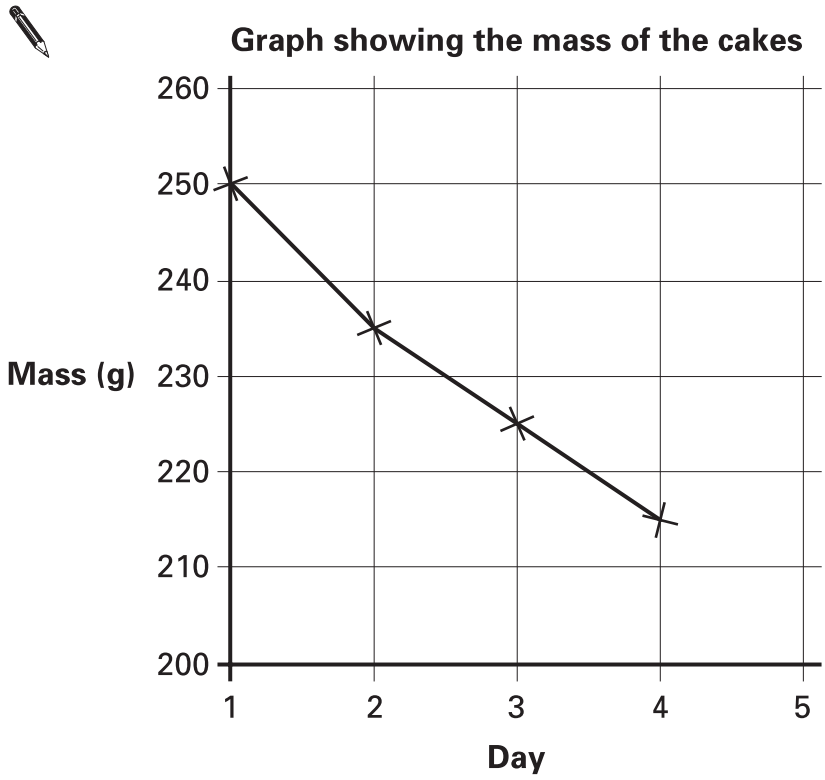
What is inside these small spaces?

.....

6b
1 mark

(c) Jacob leaves the cakes on a plate on the table.

He records the mass of the cakes every day.



6ci
1 mark

(i) On day 5, the mass of the cakes was 210 g.

Draw an 'X' on the graph above to show the mass of the cakes on **day 5**.

(ii) Look at the graph.

What was the mass of the cakes on **day 2**?

..... g

6cii
1 mark

Total out of 4

7

Plant

(a) Beth grows a plant indoors.

She keeps the plant on a window sill and waters it regularly.

The bud is covered by sepals.

What is the function of the sepals?

7a

1 mark

.....

(b) Complete the sentence below to show what the Sun gives the plant to make new materials for growth.

7b

1 mark

The Sun gives the plant warmth and ..... to make new materials for growth.

(c) In what part of the plant are new materials made for growth?

.....

7c

1 mark

(d) This is Beth's plant when the flower is open.

It has bright, colourful petals.

What is the function of the bright colourful petals?

.....

7d

1 mark

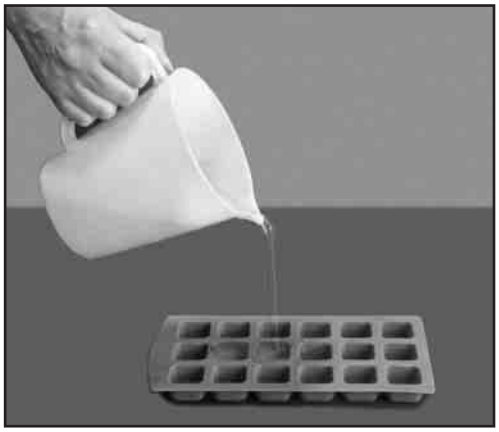
Total out of 4

8

Ice cubes

(a) Scott makes ice cubes.

He pours water into an ice cube tray.



Scott puts the ice cube tray into the freezer.

The temperature of the water changes when it is in the freezer.

What happens to the temperature of the water after it is put in the freezer?

8a

1 mark

.....

(b) Name **ONE** piece of equipment Scott could use to measure the temperature of the water.

8b

1 mark

.....

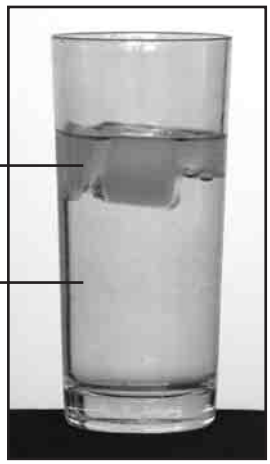
(c) The water in the ice cube tray freezes and becomes ice.

Write **true** or **false** next to each statement about freezing.

	True or **false?**
Water freezes at 100°C.	.....
Freezing water is a reversible change.	.....
Freezing is a change from solid to liquid.	.....

8c
1 mark

(d) Scott takes the ice cubes out of the freezer and puts some in a glass of water.



He leaves the glass in a warm room.

Name the scientific process that happens to the floating ice cubes after they are added to the water.

..... 8d
1 mark

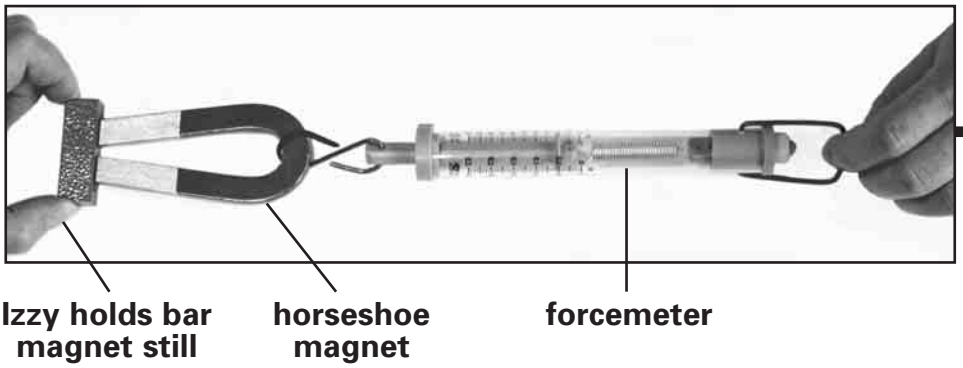
Total out of 4

9

Magnets

(a) Callum and Izzy want to find out the force needed to pull different bar magnets apart from a horseshoe magnet.

They set up the equipment as shown in the photo.



Callum needs to measure the force as the magnets separate. It is difficult. The forcemeter reading goes back to zero as soon as the magnets separate.

Would the suggestions below help Callum get more reliable results? Write **yes** or **no** after each suggestion.

	Yes or **no?**
Take a practice measurement to find out roughly when the magnets separate.	.....
Pull the forcemeter very quickly.	.....
Take the measurement three times.	.....
Use a different horseshoe magnet each time.	.....

9ai 1 mark

9aii 1 mark

(b) Callum measures the force using N as the unit of measurement.

What unit of measurement does N stand for?

9b 1 mark

.....

(c) Callum and Izzy test more bar magnets. In the table they record the force needed to pull each bar magnet apart from the horseshoe magnet.

Bar magnet tested	Length of bar magnet (cm)	Force needed to pull magnets apart (N)
A	1.5	2.5
B	5.0	1.8
C	7.0	7.0
D	7.5	3.0

What was the **length** of the weakest bar magnet?

..... cm

9c
1 mark

(d) Before the test, Callum made a prediction. He said, 'Longer magnets will need more force to separate them from the horseshoe magnet.' The results do not support Callum's prediction.

Describe how the results do **not** support Callum's prediction.

.....

.....

9d
1 mark

(e) Callum and Izzy think of different questions they could investigate.

Write **true** or **false** next to each question to show if the investigation would compare how **strong** the magnets are.

True or **false?**

How many layers of paper will stop each magnet attracting a pin? .....

How many types of materials will the magnets attract? .....

How many paperclips will each magnet hold? .....

9e
1 mark

Total out of 6

END OF TEST

Please check your answers

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