Sc

KEY STAGE 2

LEVELS 3–5

2010

National sampling for science

Test A

0510SA

First name _____

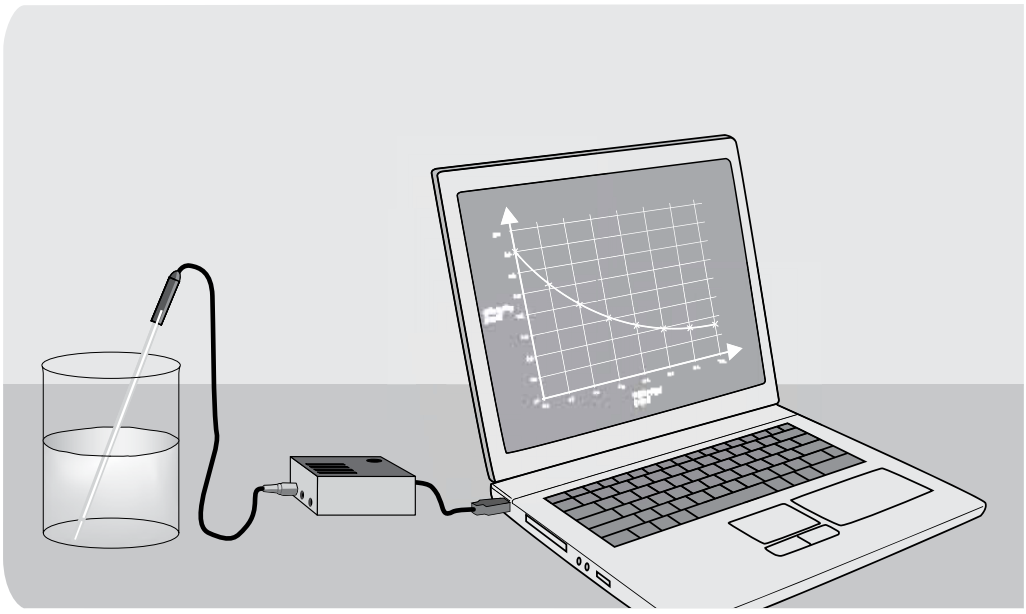
Middle name _____

Last name _____

Date of birth Day _____ Month _____ Year _____

Please circle one Boy Girl

School _____



0510SA01

Do not write on this page.

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.

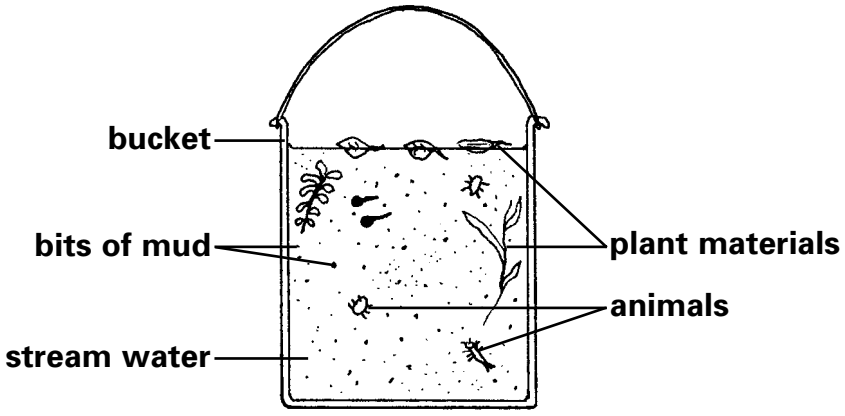
Do not write in the grey margins.

Do not write on or near the bar codes.

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

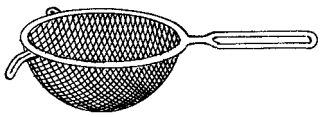
1 Drinking water

(a) People who walk in the mountains can travel a long way from towns.
They might have to get their drinking water from a stream.
The water must be made safe before they drink it.



Animals can be separated from the water using the equipment shown below.

What is the equipment in the picture below called?

.....  (1 mark)

(b) It is important to put the animals back where they were found.

Write **true** or **false** next to each statement to show why it is important for the animals to be put back in the stream.

	True or **false**?
because the animals are adapted to live in the stream	.....
so the animals do not get eaten by predators	..... (1 mark)

(c) There are still bits of mud in the water. The mud can be separated from the water by filtering.

Explain how the filter paper separates the mud and water.

.....

.....

(1 mark)

(d) It is still not a good idea to drink the water because there are micro-organisms in it.

What is likely to happen to people who drink stream water with micro-organisms in it?

.....

(1 mark)

(e) Boiling the water helps to make it safe to drink.

Tick **ONE** box to show the best way for walkers to boil the water.

Hold it over a torch.	☐	Hang it over a fire in a pot.	☐
Put the water in an insulated flask.	☐	Leave it in a sunny place.	☐

(1 mark)

(f) Tick **ONE** box to show the temperature at which water boils.

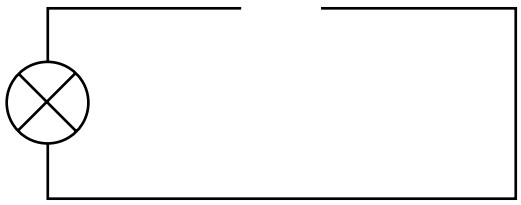
0°C	☐	10°C	☐	100°C	☐	1000°C	☐

(1 mark)

2 Circuit

(a) Abida makes a circuit with a bulb, cell and wire.

Complete the diagram of Abida's circuit below by drawing the symbol for a cell and connecting the cell in the circuit.

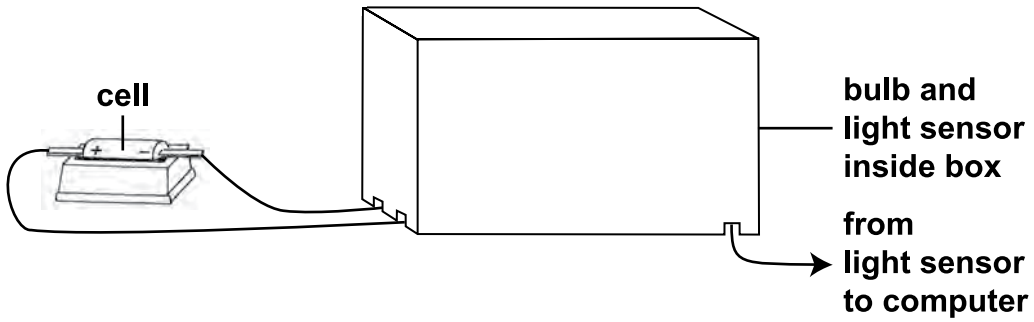


(1 mark)

(b) Name the piece of equipment that Abida could add to her circuit so she can turn the bulb on and off.

..... (1 mark)

(c) Abida wants to measure the brightness of the bulb in her circuit.
She puts the bulb and a light sensor under a box.
The light sensor measures the brightness of the bulb.



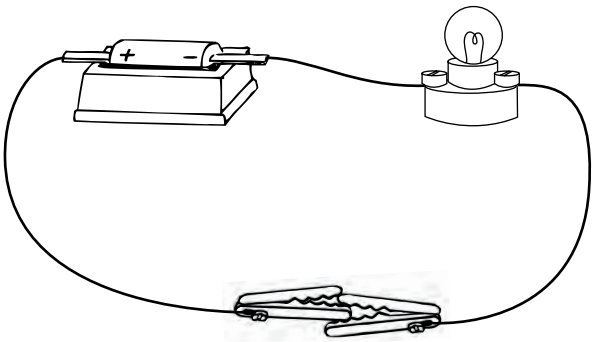
Tick **ONE** box to show why Abida puts **both** the bulb and light sensor inside the box.

so the bulb is insulated	☐	so she does not measure light from other sources	☐
so the bulb lights up more brightly	☐	so the light from the bulb cannot be seen	☐

(1 mark)

(d) Abida uses the sensor to measure the brightness of the bulb in the circuit below.

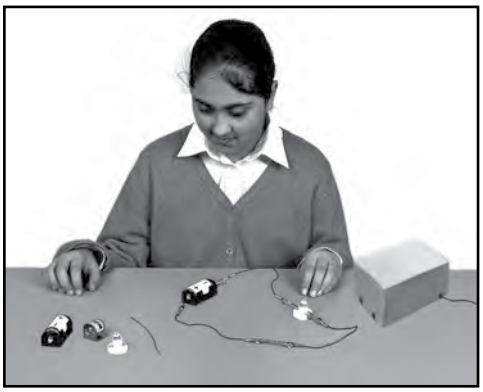
She wants to find out if she can change the brightness of the bulb in her circuit.



Each time she adds one object between the clips, the bulb lights up.

Abida measures the brightness of the bulb for each object.

Then she takes the object out again.



How will the brightness of the bulb change when Abida correctly adds each object to her circuit?

Tick **ONE** box in each row of the table.

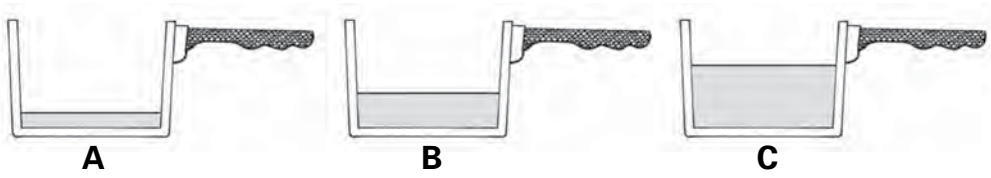
Object used	The bulb… will be dimmer.	will not change.	will be brighter.
copper wire			
a motor			
another cell			
another bulb			

(2 marks)

3 Heating water

(a) Jenna has three saucepans of water.

Jenna wants to find out how long it will take to heat each saucepan of water to 50°C. Look at the diagram.



What variable is Jenna changing in her investigation?

..... (1 mark)

(b) Jenna times how long it takes to heat each saucepan of water to 50°C. Jenna's mum helps her to do this safely.

Name a piece of equipment Jenna could use to measure the temperature of the water.

..... (1 mark)

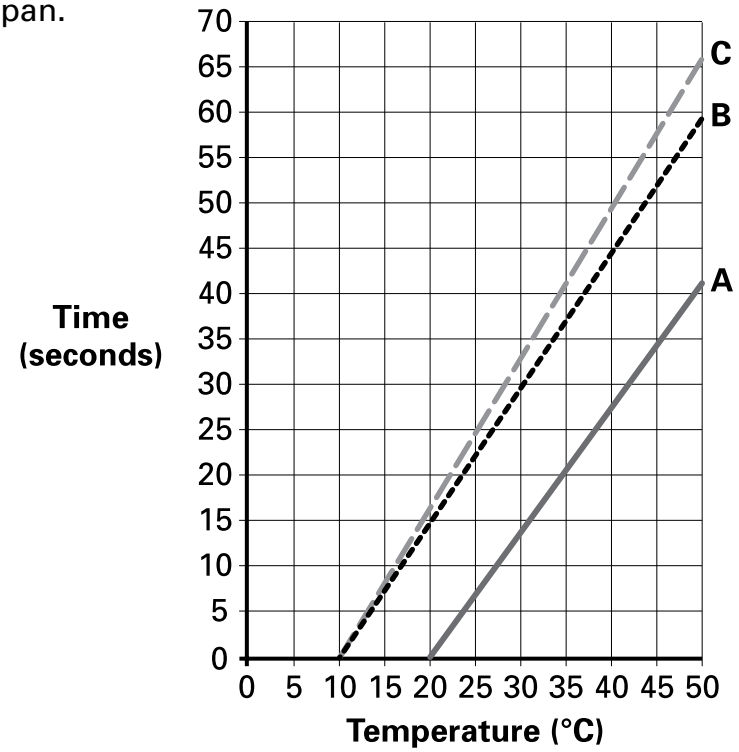
(c) Each saucepan has a wooden handle.

How does the wooden handle make using the saucepan safer?

.....

..... (1 mark)

(d) The graph below shows how the water temperature changed in each saucepan.



When Jenna looked at the graph she realised her test was **not** fair.

Why was Jenna's test **not** fair? Use the graph to help you.

.....

.....

(1 mark)

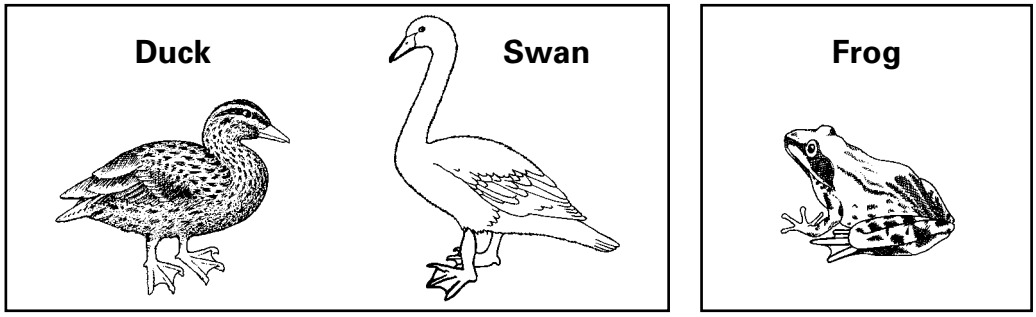
(e) How much time did it take the water in saucepans **A** and **B** to reach 50°C? Use the graph to help you complete the table.

Saucepan	Time to reach 50°C (seconds)
A	
B	
C	66

(1 mark)

4 River wildlife

(a) Some children visit a river and see a duck, a swan and a frog. The children use the features of the animals to sort the duck and swan into one group and the frog into another.



[These are not to scale]

(i) Name a feature of the duck and the swan that puts them in the **same** group **without** the frog.

..... (1 mark)

(ii) Describe a feature the children could use to put the duck and the swan into **different** groups.

..... (1 mark)

(b) Ducks can be sorted into different groups.

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Tick **ONE** box to show why it is a good idea to sort the ducks into groups. (1 mark)

to help rescue ducks from polluted rivers	☐	to help identify different ducks	☐
to work out what a baby duck will look like when it grows	☐	because there are a lot of plants ducks like to eat	☐

(c) The children use the key below to identify some other birds they see.

Use the key to name **TWO** birds that have black feathers on their bodies.

..... and ..... (2 marks)

Key to river birds:

① Are the feathers on its body black? →	Yes: GO TO ② No: GO TO ③
② Is its beak white? →	Yes: **coot** No: **moorhen**
③ Is its beak yellow? →	Yes: GO TO ⑤ No: GO TO ④
④ Is its beak red? →	Yes: **shelduck** No: **mute swan**
⑤ Are the feathers on its wings mostly grey? →	Yes: **heron** No: **male mallard**

(d) Use the key to answer the question below.

What colour are the wings and beak of a heron?

The wings are .....

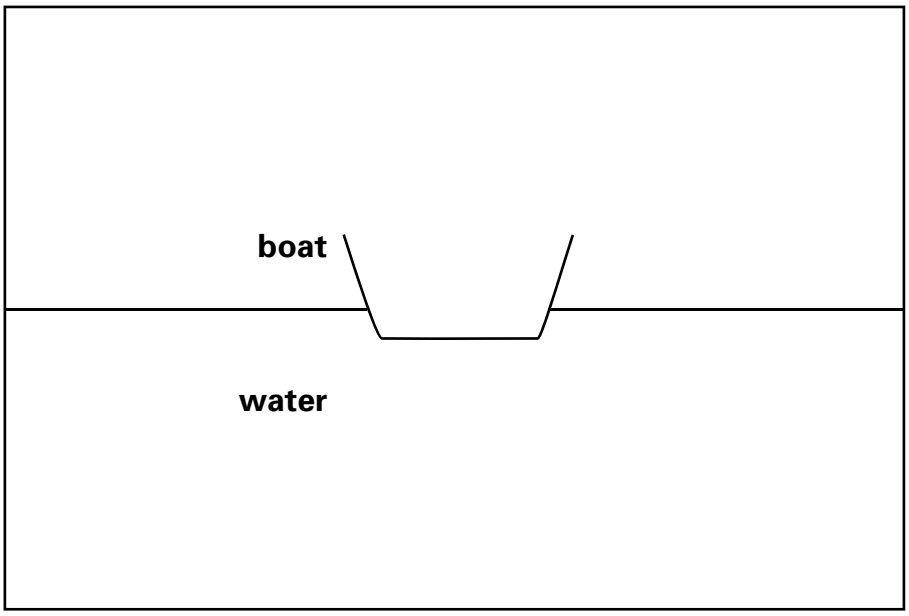
The beak is ..... (1 mark)

5 Foil boats

(a) Some children did an investigation with four foil boats.

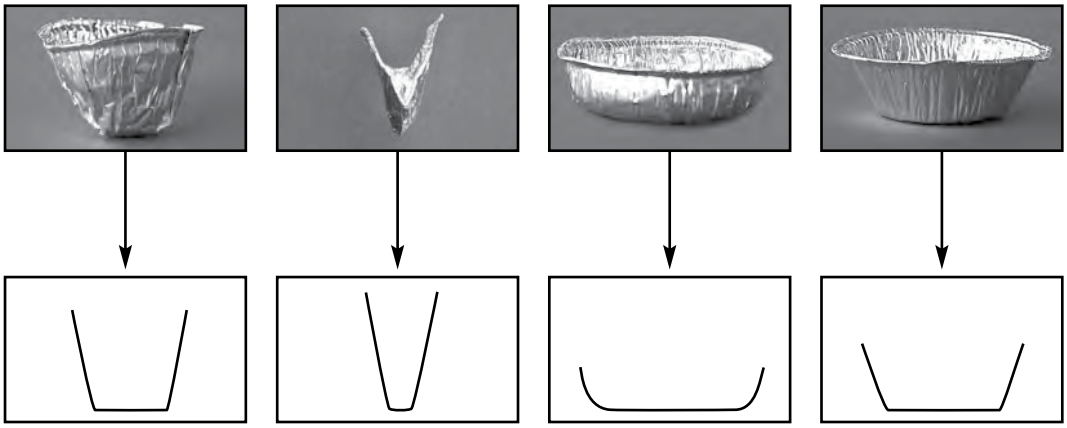
Foil boat

Draw an arrow on the diagram below to show the force from the water on the boat.



(1 mark)

(b) All of the boats were made from identical foil trays. The photographs and diagrams below show the different shapes of the boats.



The children counted how many 1p coins they put in each boat to make it sink. Boat 3 needed the most 1p coins to make it sink.

Tick **ONE** box to show why boat 3 needed the most 1p coins to make it sink.

Boat 3...

is the lightest.	☐	has the thickest base.	☐
is the strongest.	☐	has the largest base.	☐

(1 mark)

(c) Write **true** or **false** next to each of the statements about boat 3.

Compared with the other boats...

	True or **false?**
boat 3 was more waterproof.	.....
there was a bigger force from the water stopping boat 3 sinking.	.....
there was less gravity pulling down on boat 3.	.....

(2 marks)

6 Model sheep

(a) Alice has a model sheep.

The instructions say she can grow a white coat for the sheep.

Instructions:

1. Build the sheep from cardboard pieces.	2. Stand the sheep in the special liquid.	3. Leave the sheep for two days.

The special liquid was made by mixing a solid in water.

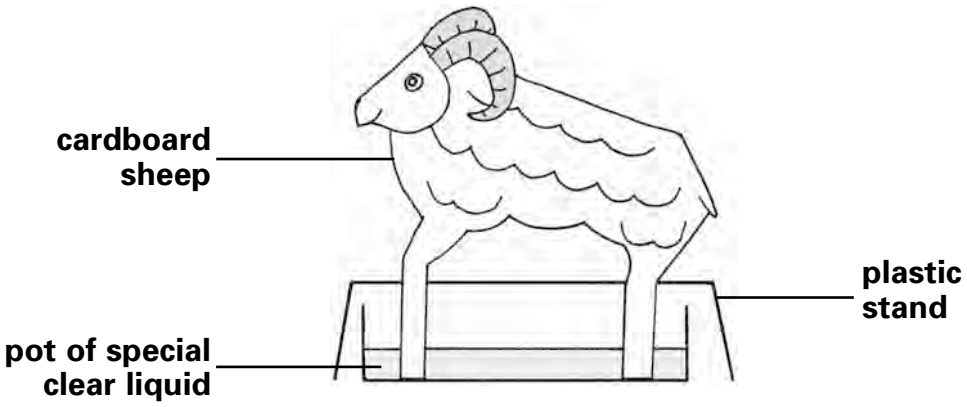
After the solid mixed with the water, the liquid was completely clear.

Explain why Alice cannot see the solid mixed in the liquid.

.....

(1 mark)

(b) The special clear liquid soaks up to the top of the cardboard sheep.



Which property of cardboard allows it to soak up the liquid?

Tick **ONE** box.

soft	☐	opaque	☐
strong	☐	absorbent	☐
rigid	☐	smooth	☐

(1 mark)

(c) After the special liquid has soaked into the cardboard, the water separates from the solid.

A white coat slowly grows on the sheep.

The white coat is made out of the solid from the special liquid.
After 2 days the white coat stops growing.

Explain why the sheep's coat stops growing.

.....

.....

(1 mark)

(d) The sheep's coat was made by the solid that had been mixed in the water.

Tick **ONE** box to show what the sheep's coat could be made of.

chalk ☐ flour ☐

rice ☐ salt ☐

(1 mark)

7 Watering plants

(a) David knows that plants need water to grow.

Name **TWO other** things that plants need to take in for healthy growth.

..... and ..... (2 marks)

(b) David grows some plants.
He wants to find out if the amount of water affects their growth.

Tick **ONE** box after **each** question to show the **best** way for David to carry out his test.

Should David use the same type of soil in each pot?	yes	☐	no	☐
Should David put the plant pots in the same place?	yes	☐	no	☐
Should David put the same amount of water in each pot?	yes	☐	no	☐
How many plants should David use?	2 plants	☐	5 plants	☐

(2 marks)

(c) Plants absorb rain water from the soil.

Name the **TWO** parts of the plant the water must travel through to get from the soil to the leaves.

1. .....

2. ..... (1 mark)

(d) Rain falling is part of the water cycle.

Write the letters **A**–**E** on the diagram to show the order of the stages in the water cycle.

One stage is done for you.

Stages of the water cycle

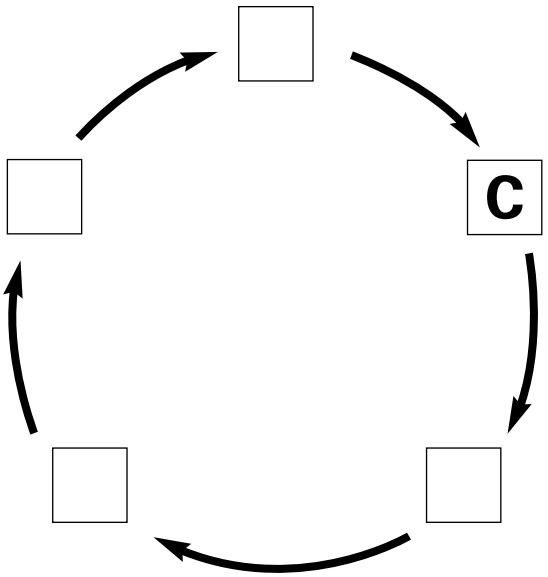
A. water vapour starts to cool down

B. water collects in rivers and lakes

C. rain falls

D. water vapour condenses

E. water evaporates



(2 marks)

8 Ice

(a) Tom is measuring the air temperature outside.

What is temperature a measure of?

..... (1 mark)

(b) Tom records the air temperatures in the table below.

(i) Write **yes** or **no** to show if Tom could find ice on the puddle each day.

	Day				
	Mon	**Tues**	**Wed**	**Thurs**	**Fri**
Temperature (°C)	3	–2	–1	–1	6
Could Tom find ice on the puddle? Yes or no?					

(1 mark)

(ii) Explain why there could be ice on the puddle on the days you chose.

.....

..... (1 mark)

END OF TEST

Please check your answers.

Do not write on this page.

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QCDA/10/4681 (Marker pack)

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