Sc

KEY STAGE 2

LEVELS 3–5

2011

Science sampling test

Test B

0511SB

First name _____

Middle name _____

Last name _____

Date of birth Day _____ Month _____ Year _____

Please circle one Boy Girl

School _____

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 barcodes.

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

1 Butterflies

(a) Some children visit a butterfly park.
They use the pictures below to identify the butterflies they see.


Swallowtail


Common Blue


Meadow Brown


Red Admiral

Sally makes some notes about one butterfly she sees.
Oliver tries to use Sally's notes to identify the butterfly.

Sally's notes:

- It has feelers on its head.
- It has wings.

Explain why Oliver **cannot** use Sally's notes to identify the butterfly.

.....

(1 mark)

(b) Ahmed drew a butterfly.
It is **not** a Common Blue.

Ahmed's drawing

Tick **ONE** feature of **Ahmed's** butterfly and describe how it is different from a Common Blue.

Feature: body ☐ wings ☐

This feature of **Ahmed's** butterfly is different because .....

.....

(1 mark)

(c) The children write conclusions about the butterflies.

Look at the butterflies and decide whether each conclusion is **true**, **false** or you **cannot tell**. Tick **ONE** box for each conclusion.

All of these butterflies...	True	False	Cannot tell
have spots on their wings.	☐	☐	☐
are eaten by the same predators.	☐	☐	☐
are the same age.	☐	☐	☐
have antennae which are longer than their bodies.	☐	☐	☐

(2 marks)

(d) The number of butterflies in Britain is gradually getting smaller.

Tick **TWO** boxes to show what is likely to cause the number of butterflies to get smaller.

There are fewer butterflies because there are...

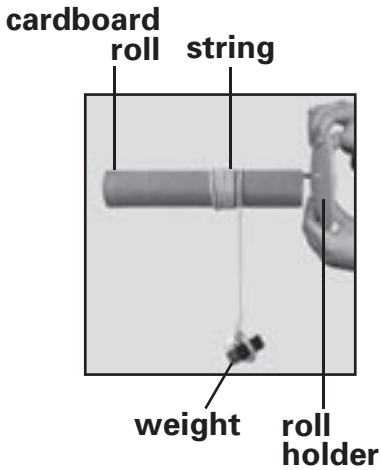
- more houses being built on woodland or grassland. ☐
- more schools with wildlife areas. ☐
- fewer predators eating caterpillars and butterflies. ☐
- fewer plants which butterflies feed on being grown in gardens. ☐
- fewer diseases among the butterflies. ☐

(2 marks)

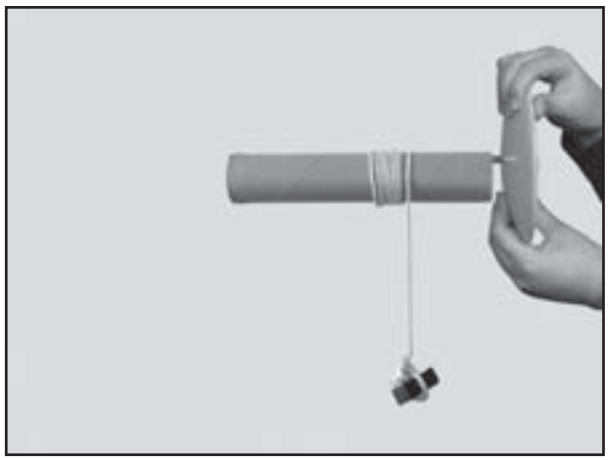
2 Spinning cardboard roll

(a) Owen ties a weight onto some string. He winds the string around a cardboard roll.

Owen lets go of the weight. The weight falls, the cardboard roll spins and the string unwinds. Owen records the time taken for the string to unwind.



Draw **ONE** arrow on the picture below to show the direction of the force that makes the weight fall.



(1 mark)

(b) Tick **ONE** box to show the piece of equipment Owen should use to measure the time taken for the string to unwind.

Ruler ☐

Forcemeter ☐

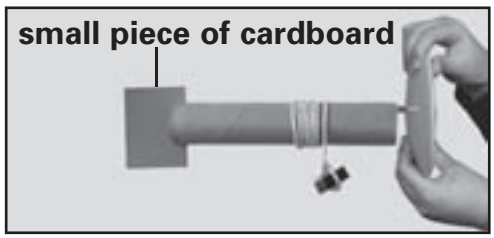
Stopwatch ☐

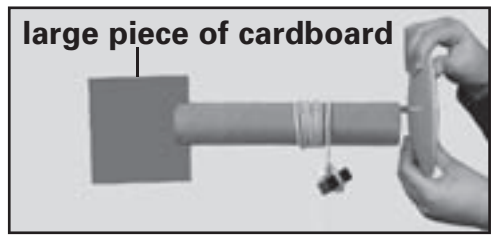
Scales ☐

(1 mark)

(c) Owen repeats his test.

He slots different sized pieces of cardboard into the roll each time.





The table below shows Owen's results.

Size of the piece of cardboard (cm^2)	24	48	80	120
Time taken for string to unwind (s)	1.5	2.4	4.0	9.3

Estimate the time taken for the string to unwind when the size of the piece of cardboard is 30 cm^2.

..... s (1 mark)

(d) The larger the piece of cardboard, the more slowly it spins.

Name the force that slows down the spinning piece of cardboard.

..... (1 mark)

(e) After the test, Owen thinks of four more questions about the spinning roll.

Tick **THREE** boxes to show which of these questions he could answer by doing more tests with the spinning roll.

Will the time to unwind be longer if the string is longer?	☐	What is the name of the force that makes the weight fall?	☐
How can I make the string unwind more slowly?	☐	What happens if I put two weights on the string?	☐

(1 mark)

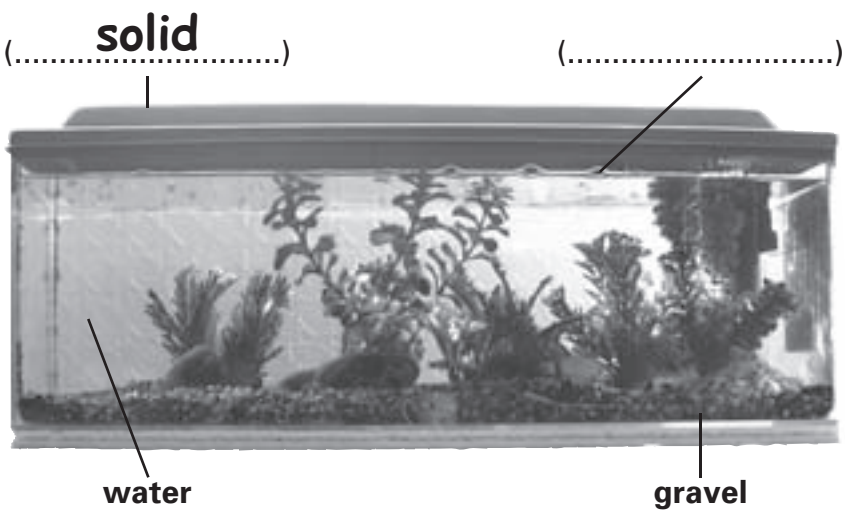
3 Fish tank

(a) Philip's class has some goldfish in a fish tank.
The picture below shows the fish tank.

Write **solid**, **liquid** or **gas** to complete each label on the diagram.

One has been done for you.

plastic lid — **inside the bubble**



(1 mark)

(b) Philip needs to clean the fish tank.
He takes the fish and the plants out of the fish tank.

Sieve

The teacher tips the dirty water and gravel from the fish tank into a sieve.

Complete the sentences below to show what happens to the gravel and the water when they are separated with the sieve.

The gravel .....

The water ..... (1 mark)

(c) There are micro-organisms in the gravel.

Write **true** or **false** next to each sentence about the micro-organisms living in the gravel.

True or **false**?

Micro-organisms...

are small enough to live in between the gravel. .....

can break down leftover fish food. ..... (1 mark)

(d) The micro-organisms living in the fish tank carry out life processes.

Tick **TWO** boxes to show which **two** statements about the life processes of the living micro-organisms are true.

In the fish tank...

- the micro-organisms need nutrients. ☐
- the micro-organisms do **not** grow. ☐
- the micro-organisms do **not** reproduce. ☐
- the micro-organisms can move. ☐

(1 mark)

4 Investigating pulse rate

(a) Jo and Sabia are finding out about pulse rate and exercise.
Their teacher tells them two ways they can measure pulse rate.

Method 1:	**Method 2:**
Feel the pulse in your wrist and count the beats in a minute.	Use an electronic sensor to measure the pulse rate.

Jo says, 'Method 2 is better because it gives results more quickly.'

Give **ONE other** reason why method 2 is better at measuring pulse rate than method 1.

..... (1 mark)

(b) Jo and Sabia plan an investigation. Their plan is shown below.

Plan

1) Record resting pulse rate.
2) Run for 2 minutes.
3) Record pulse rate again.
4) Rest for 10 minutes.
5) Repeat the test for skipping, dribbling a football and jumping.

Write a question Jo and Sabia could use their plan to investigate.

..... (1 mark)

(c) Jo exercises and Sabia records Jo's pulse rate.

Why is it important that the same person does all the exercises during their investigation?

..... (1 mark)

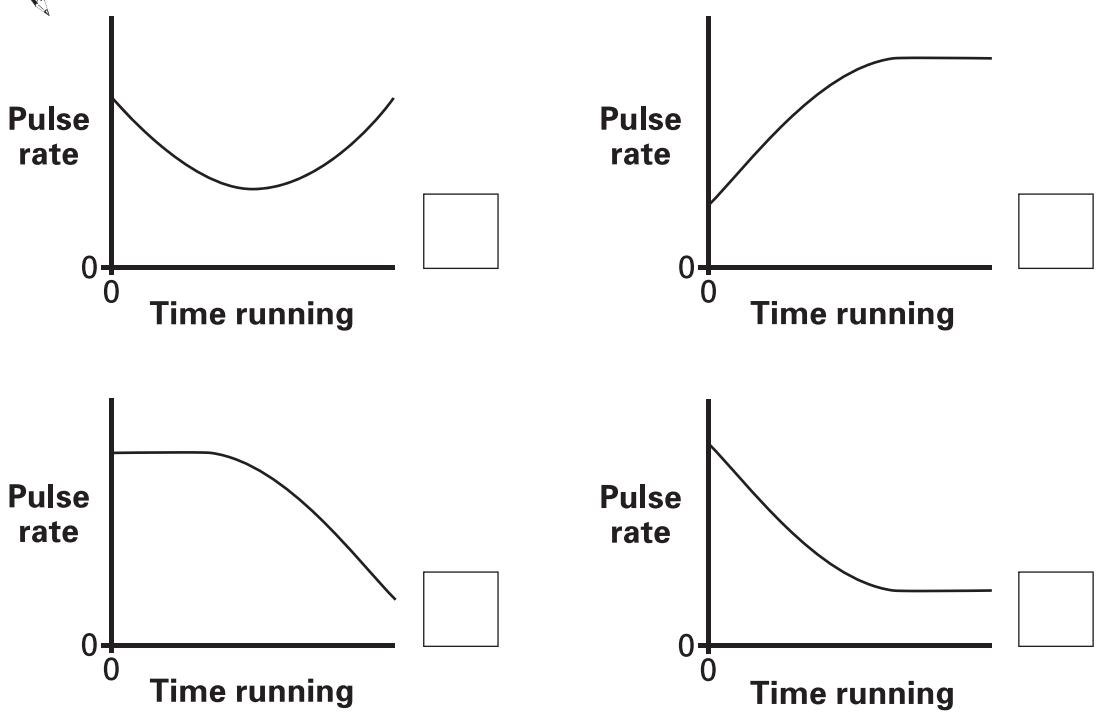
(d) The table below shows their results.

Exercise	Jo's pulse rate (beats per minute)...	
	before exercise.	after exercising for 2 minutes.
running	72	163
skipping	72	165
dribbling a football	70	155
jumping	75	152

What was Jo's pulse rate after skipping for two minutes?

..... beats per minute (1 mark)

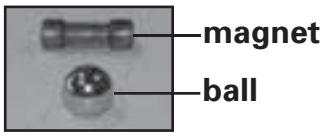
(e) Which graph shows what will happen to Jo's pulse rate if she **runs** at the same speed for 15 minutes, starting from rest?
Tick **ONE** box.



(1 mark)

5 Magnetic toy

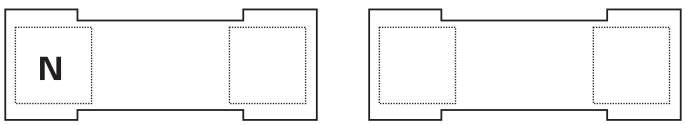
(a) Sam has a toy made of magnets and balls.
He tries to put different magnets together.



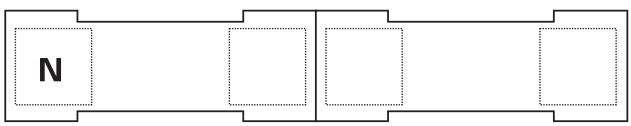
Write **N** (North) or **S** (South) on each end of each magnet below to explain Sam's observations. Some have been done for you.

Sam's observations

The ends of these magnets push away from each other.

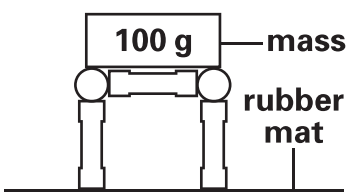


The ends of these magnets pull together.

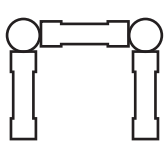
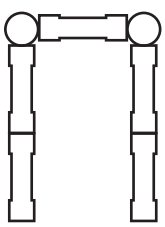
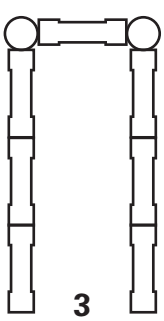


(1 mark)

(b) The magnets attract the balls. Sam makes a tower using the magnets and the balls. He wants to test how strong the tower is.
He puts a 100 g mass on the tower.
He adds masses until the tower falls apart onto a rubber mat.



Sam repeats his test with two different towers.
His results are shown in the table below.

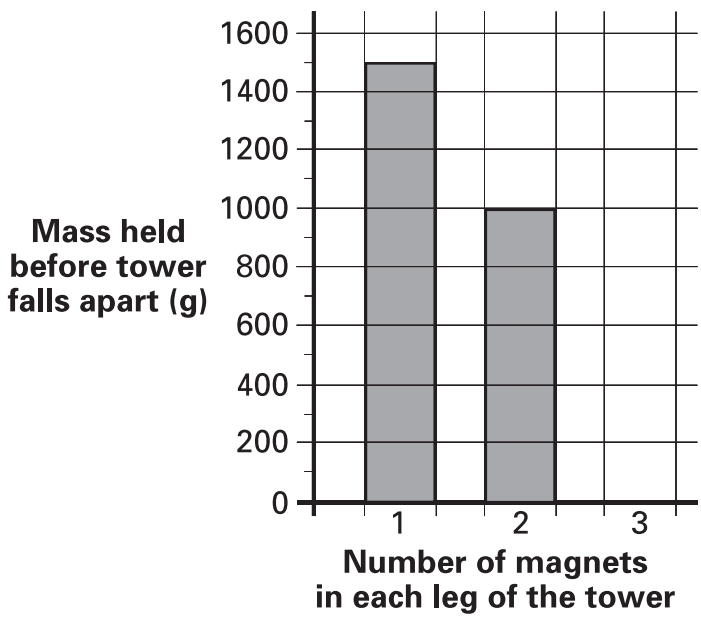
Number of magnets in each leg of the tower	 1	 2	 3
Mass held before tower falls apart (g)	1500	1000	700

Tick **THREE** boxes to show which variables Sam kept the same to make his test fair.

the size of each magnet	☐	the number of masses put on each tower	☐
the size of each ball	☐	the number of balls in each tower	☐
the size of the rubber mat	☐	the number of magnets in each tower	☐

(2 marks)

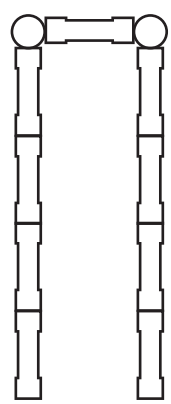
(c) Complete the graph by drawing the missing bar.
Use the results table to help you.



(1 mark)

(d) Predict the mass that could be held by a tower with four magnets in each leg.
Use the results table to help you.

..... g



(1 mark)

6 Separating materials

(a) Vishal has a mixture of salt and sand.
He adds some water and stirs the mixture.

Complete the sentences below to show what will happen to the salt and sand mixture after Vishal stirs in water.

The salt will .....

The sand will ..... (1 mark)

(b) Vishal uses this equipment to separate the sand from the salt and water.

Describe how the sand is separated from the salt and water with this equipment.

The water .....

The salt .....

The sand ..... (1 mark)

(c) Tick **ONE** box to show which process Vishal could use to get the salt back from the salt and water mixture.

condensation	☐	evaporation	☐
filtration	☐	sieving	☐

(1 mark)

(d) Magnets can be used to separate some mixtures.

(i) Tick **ONE** box to show the mixture which could be separated with a magnet.

brass pins and peas	☐	iron nails and steel paperclips	☐
steel paperclips and rice	☐	copper beads and brass pins	☐

(1 mark)

(ii) Explain how a magnet can be used to separate the two objects in the mixture you chose.

.....

.....

(1 mark)

7 Trees

(a) Class 6 are investigating trees in their school grounds.

root ——

Describe **ONE** function of the roots.

..... (1 mark)

(b) Tree leaves absorb light from the Sun.

Tick **ONE** box to show the life process for which leaves absorb light.

reproduction	☐	nutrition	☐
movement	☐	germination	☐

(1 mark)

(c) The children observe the flowers on some of the trees.

Complete the labels to name the parts of flower A on the diagram below.

..... —— **petal** (1 mark)

..... —— (1 mark)

Flower A

(d) Here are the children's observations of flower B:

Flower B

The flower does not have a smell.
It does not have bright petals.
It has lots of long stamens.

Tick **ONE** box to show how flower B is pollinated.
Use the children's observations to help you.

by insects	☐	by birds	☐
by wind	☐	by humans	☐

(1 mark)

(e) The table below can be used to sort the flowers on the trees.

Write **all** the names of the flowers in the correct boxes on the sorting diagram. One has been done for you.

Manna ash	**Magnolia**	**Pear**	**Almond**	**Lilac**	**Elder**

	Flower has five petals	**Flower does not have five petals**
Flowers are grouped together on the stem		Manna ash
Flowers are spread out along the stem		

(2 marks)

8 Chocolate

(a) Lucy has a fruit and nut chocolate bar.

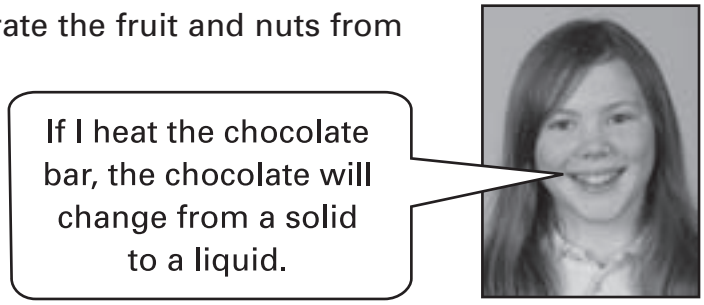
Tick **THREE** boxes to show **three** properties of **solid** chocolate.

Solid chocolate...

flows.	☐	does not flow.	☐
changes shape.	☐	does not change shape.	☐
changes volume.	☐	does not change volume.	☐

(1 mark)

(b) Lucy wants to separate the fruit and nuts from the chocolate.



Lucy

Name the scientific process that happens when Lucy heats the chocolate bar.

..... (1 mark)

(c) Lucy uses a sieve to separate the liquid chocolate from the fruit and nuts.

Describe **ONE** property of the liquid chocolate that allows it to go through the sieve.

..... (1 mark)

END OF TEST

Please check your answers.

Do not write on this page.

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QCDA/11/5241 (Mark schemes pack)