Science sampling test

Test A

<table>
<thead>
<tr>
<th>First name</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle name</td>
<td></td>
</tr>
<tr>
<td>Last name</td>
<td></td>
</tr>
<tr>
<td>Date of birth</td>
<td>Day</td>
</tr>
<tr>
<td>Please circle one</td>
<td>Boy</td>
</tr>
<tr>
<td>School name</td>
<td></td>
</tr>
</tbody>
</table>
PLEASE 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.
PLEASE DO NOT WRITE ON THIS PAGE
1 Birds in their environments

(a) Many water birds have webbed feet.

Why are webbed feet useful to water birds?

(b) Birds have different shaped beaks.
The shape of the bird’s beak is suited to the food the bird eats.

Draw THREE lines to match each beak to the food the bird eats.

Beak

Food

animals buried deep in mud small seeds and berries meat torn from prey

(1 mark)

(c) There is a law in England to stop people taking eggs from the nests of wild birds.

It is important for wild birds that people stop taking their eggs.
Tick ONE box to show why.

because there would be no food for foxes because birds’ eggs break easily

so people do not hurt themselves taking eggs so there are enough birds to reproduce

(1 mark)
2 In the kitchen

(a) Sophie and her dad are cooking in the kitchen. Sophie spills some flour onto some raisins.

Tick ONE box to show the equipment Sophie could use to separate the flour from the raisins quickly.

Wooden spoon

Sieve

Weighing scales

Filter

(b) Sophie thinks of some things you can do in the kitchen. The activities cause the materials to change.

Complete the table by writing **solid, liquid or gas** in each box to show how the materials change. One box has been done for you.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baking a cake</td>
<td>liquid</td>
<td></td>
</tr>
<tr>
<td>Melting butter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Making ice cubes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1 mark)
(c) **Write** **yes** or **no** in each row of the table to show if the activity causes a **reversible** change.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Does the activity cause a reversible change? Yes or no?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baking a cake</td>
<td></td>
</tr>
<tr>
<td>Frying eggs</td>
<td></td>
</tr>
<tr>
<td>Dissolving sugar</td>
<td></td>
</tr>
<tr>
<td>Burning candles on a birthday</td>
<td></td>
</tr>
<tr>
<td>cake</td>
<td></td>
</tr>
<tr>
<td>Making ice cubes</td>
<td></td>
</tr>
</tbody>
</table>

(d) Sophie’s dad heats water in a saucepan. The water does **not** boil. The level of the water in the pan goes down as the water is heated.

Name the scientific process that causes the level of the water to go down as it is heated.

......................................................

(e) There is a window near the pan of hot water. Sophie notices condensation is forming on the inside of the window.

Why does condensation form on the window? Tick **ONE** box.

Condensation forms because the window is...

- smooth. 
- transparent. 
- cold. 
- hard. 

(1 mark)
3 Animal heart rates

(a) Some children found out about the heart rate of some fully grown animals.

<table>
<thead>
<tr>
<th>Fully grown animal (drawings not to scale)</th>
<th>Average mass of animal (kg)</th>
<th>Average heart rate (beats per minute)</th>
</tr>
</thead>
<tbody>
<tr>
<td>elephant</td>
<td>3000</td>
<td>35</td>
</tr>
<tr>
<td>human</td>
<td>68</td>
<td>70</td>
</tr>
<tr>
<td>cat</td>
<td>7</td>
<td>130</td>
</tr>
<tr>
<td>rabbit</td>
<td>4</td>
<td>205</td>
</tr>
<tr>
<td>squirrel</td>
<td>0.5</td>
<td>400</td>
</tr>
</tbody>
</table>

Use the table to answer the next three questions.

(i) Which fully grown animal has the fastest average heart rate?

...............................................  

(ii) What is the average mass of a fully grown cat?

............................................... kg
(iii) What is the average heart rate of the fully grown animal whose mass is 4 kg?

........................................... beats per minute (2 marks)

(b) Describe the relationship between the **mass** of the animal and **heart rate** shown in this table.

........................................................................................................................................

........................................................................................................................................ (1 mark)

(c) This dog has a mass of 30kg.

Predict the heart rate of this dog.

Use the table to help you.

...................................................... beats per minute (1 mark)
4 Seaweed and trees

(a) Maria found different types of seaweed on the beach.

Her teacher has a key to identify the seaweeds.

Is the seaweed branched?

Yes

No

Are the edges of the seaweed jagged?

Yes

No

Serrated wrack

Bladder wrack

Is the seaweed long and thin?

Yes

No

Gutweed

Sea lettuce

Use the key to identify the different seaweeds below.

Seaweed A has been done for you.

Seaweed A is Bladder wrack

Seaweed B is

Seaweed C is

Seaweed D is

(1 mark)
(b) Bladder wrack seaweed has pockets filled with gas. The pockets help it float near the surface of the water to get more sunlight.

Draw ONE arrow on the diagram to show the force from the water that makes the seaweed float near the surface of the water.

(c) Trees also have features that help their leaves to get as much sunlight as possible.

Tick ONE feature of a tree and explain how this feature helps the leaves to get as much sunlight as possible.

trunk    branches

How the feature helps the leaves to get sunlight: ........................................
........................................................................................................................................

(1 mark)

(d) Seaweeds do not have roots. Trees do have roots.

Tick THREE boxes to show the functions of tree roots.

to make seeds   to absorb water

to anchor the plant in the ground   to take up minerals

to carry new material for growth to the leaves   to protect the plant from predators

(1 mark)
5 Road safety

(a) Julia has a bike with a light.

The picture below shows the circuit in Julia’s light.

![Circuit Diagram]

(i) Draw a circuit diagram to show the circuit in Julia’s light. Use symbols in your drawing.

(ii) What should Julia add to her circuit to make the light brighter?

Julia should add ........................................................................................................ (1 mark)
(b) It is important for people riding bikes to be seen in the dark. The pictures below show what two jackets look like when Julia shines a torch on each of them.

![Jacket A](image)

![Jacket B](image)

Julia can see jacket B better than jacket A.

Explain what happens to the light from the torch for Julia to see jacket B better than jacket A.

........................................................................................................................................

........................................................................................................................................ (1 mark)

(c) Julia’s house is near a bend in the road. There is a mirror on a pole so car drivers can see people coming round the bend.

Draw TWO arrows on the diagram below to show the direction light travels for the car driver to see the light on Julia’s bike.

![Diagram](image)
6 Arms

(a) Label the diagram to show what causes the arm bones to move in a human body.

...........................................................................................................

(b) Describe ONE way that humans can keep their bones strong.

...........................................................................................................

(c) Aziz is comparing the size of straight arms and bent arms. He measures around the top of his friend’s arm when it is straight and when it is bent.

He repeats his investigation with other friends. Aziz makes sure his investigation is fair.
Write **true** or **false** next to each statement to show if it would make Aziz’s investigation fair.

To make his investigation fair, Aziz must...

- make sure everyone rolls up their sleeves. ........................................
- measure the arms of lots of children. ........................................
- measure around the arms in the same place. ........................................ (2 marks)

(d) Here are Aziz’s results:

![Bar chart showing arm measurements for straight and bent arms for different children]

Look at the graph.

Describe how the arm **measurements** are different for straight arms and bent arms. Complete the sentence below.

When the children’s arms are bent ........................................

.................................................................................................................. (1 mark)
Class 6J want to find out which material is best at keeping drinking chocolate hot.

The class have four identical plastic cups. They wrap each one in a different material. They put the same amount of chocolate drink in each cup and put lids on.

Tick ONE box to show what property the material should have if it is best at keeping the drink hot.

- The material should be...
- strong. [ ]
- hard. [ ]
- a conductor. [ ]
- an insulator. [ ]

(1 mark)
(b) The class measure the temperature of the drinking chocolate in each cup every five minutes.

They record their results in a table.

One result looks incorrect.

<table>
<thead>
<tr>
<th>Material around the cup</th>
<th>Temperature of drinking chocolate after... (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 minutes</td>
</tr>
<tr>
<td>Newspaper</td>
<td>70</td>
</tr>
<tr>
<td>Foil</td>
<td>70</td>
</tr>
<tr>
<td>Food wrap</td>
<td>70</td>
</tr>
<tr>
<td>Bubble wrap</td>
<td>70</td>
</tr>
</tbody>
</table>

Which result in the table should they check again?
Write the number.

....................................................... (1 mark)

(c) Look carefully at the results table.

Complete the sentence below to show which material was best at keeping the drinking chocolate hot and explain why.

....................................................... was the best material for keeping
the drinking chocolate hot because at the end of the test ............... 

................................................................. (1 mark)
8 Germinating seeds

(a) Sunita wants to find out if some types of seed germinate more quickly than others.
Sunita plants her seeds in seed trays.

Name the ONE variable Sunita is changing in her investigation.

..............................................................................................................
(1 mark)

(b) Sunita needs to make sure her investigation is fair.

Name TWO variables Sunita should keep the same to make her investigation fair.

1 ..................................................................................................................
(1 mark)

2 ..................................................................................................................
(c) When a seed germinates, a root starts to grow before a shoot.

Sunita measures which type of seed germinates first by recording when she first sees the shoot.

Explain why Sunita records when the shoot first appears and not when the root first appears.

................................................................................................................................................

................................................................................................................................................

(1 mark)

(d) Sunita planted five seeds of each type of seed in the trays.

Explain why it is a good idea to plant five seeds of each type rather than just one.

................................................................................................................................................

................................................................................................................................................

(1 mark)

(e) This diagram shows the life cycle of a plant.

A seed dispersal

B seed formation

C flower formation

D pollination

Tick ONE box to show where germination happens in the life cycle of a plant.

A  B  C  D  (1 mark)
Filters

(a) Some mixtures can be separated with a filter.

The table below shows some different mixtures.

Complete the table to show if a filter can be used to separate each mixture. Write yes or no.

One mixture has been done for you.

<table>
<thead>
<tr>
<th>Mixture</th>
<th>Can the mixture be separated by a filter? Yes or no?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand and stones</td>
<td>no</td>
</tr>
<tr>
<td>Soil and water</td>
<td></td>
</tr>
<tr>
<td>Sand and soil</td>
<td></td>
</tr>
<tr>
<td>Salt and water</td>
<td></td>
</tr>
</tbody>
</table>

(1 mark)
(b) Jemal has a mixture of chalk powder, sugar and water. He tries to filter the mixture using kitchen foil.

The foil does not separate the mixture. The foil does not break.

Explain why the foil does not separate the mixture of chalk, sugar and water.

........................................................................................................................................................................
........................................................................................................................................................................

(1 mark)

(c) Jemal makes a new filter using a paper towel.

He uses the paper towel filter to separate more of the chalk, sugar and water mixture.

The chalk stays on the paper towel. The water and sugar go into the beaker.

Describe how Jemal could separate the sugar from the water.

........................................................................................................................................................................
........................................................................................................................................................................

(1 mark)
END OF TEST

PLEASE CHECK YOUR ANSWERS

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