

Science SAT

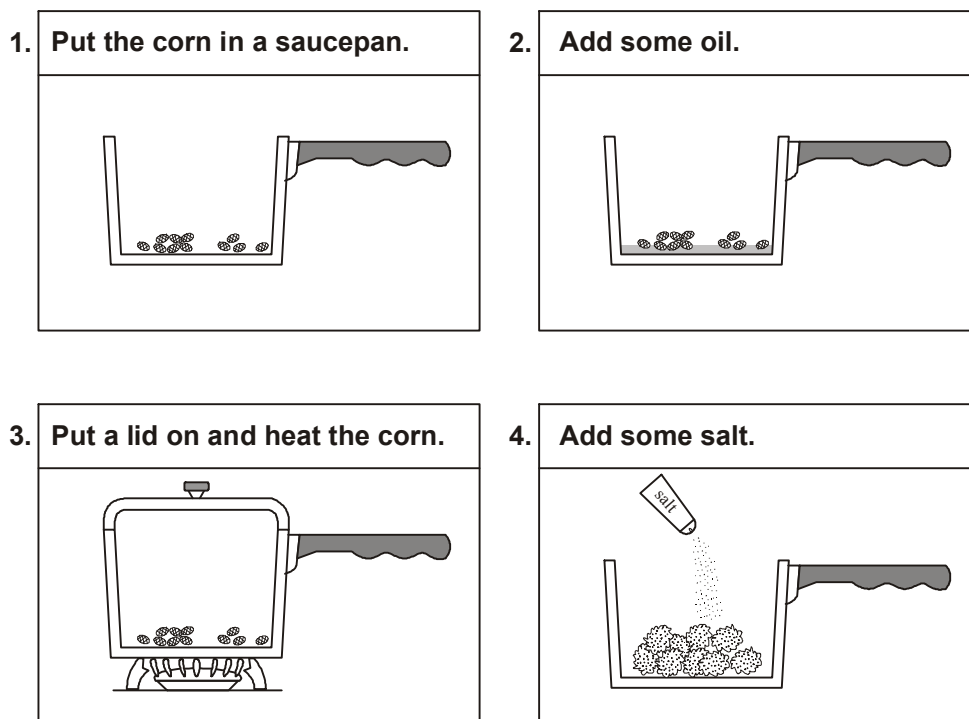
Paper A

2006
45 min
40 marks

1. Popcorn

(a) Sasha watches her father make some popcorn.

These pictures show what he does.



Use the pictures.

Tick **ONE** box after each sentence to show if it is **true** or **false**.



The **pictures** show that as the corn pops, it...

	True	False
gets bigger.	<input type="checkbox"/>	<input type="checkbox"/>
changes to a darker colour.	<input type="checkbox"/>	<input type="checkbox"/>
changes shape.	<input type="checkbox"/>	<input type="checkbox"/>
gets smoother.	<input type="checkbox"/>	<input type="checkbox"/>

2 marks

(b) After the corn is cooked it is hot.

What should Sasha measure to find out how hot the popcorn is?
Tick **ONE** box.



Sasha should measure the...

mass.	<input type="checkbox"/>	temperature.	<input type="checkbox"/>
volume.	<input type="checkbox"/>	time to cook.	<input type="checkbox"/>

1 mark

(c) Look at the pictures above.

Tick **ONE** box to show what is most likely to cause the corn to change.



salt	<input type="checkbox"/>	oil	<input type="checkbox"/>
heat	<input type="checkbox"/>	saucepan	<input type="checkbox"/>

1 mark

(d) When corn is popped, a new material is formed.

This change is not reversible.

Describe a **different** non-reversible change where another new material is formed.



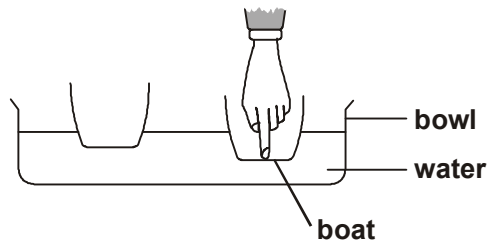
.....
.....

1 mark

2. Boats

(a) Mike puts two boats in a bowl of water. They float on the water.

Mike pushes down on one of the boats with his finger.



Tick **ONE** box to show what Mike can feel as he pushes down.



The force from the water pushing the boat up.

The force from the water pushing the boat down.

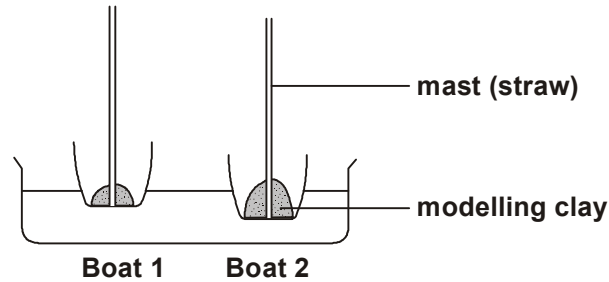
The force from the air pushing the boat up.

The force from the air pushing the boat down.

1 mark

(b) Mike makes masts for the boats with straws.

He attaches the masts to the boats using modelling clay.



Explain why boat 2 floats lower in the water than boat 1.



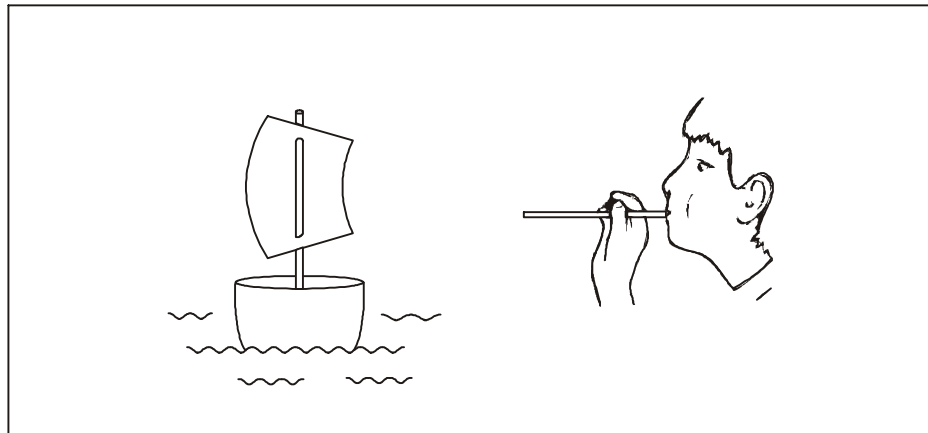
.....

1 mark

(c) Mike makes sails for the boats out of paper.

He uses a straw to blow one of the boats along.

Draw an arrow on the picture to show the direction of the force pushing the boat along.



1 mark

(d) What is the name of the force that slows the boat down?

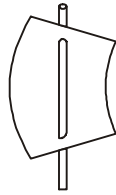


.....

1 mark

(e) Mike blows the boat when it has a big sail.

Then he puts a small sail on the boat and blows with the same force.



Big sail



Small sail

The big sail makes the boat go faster.

Explain why the bigger sail makes the boat go faster.
Write about the forces on the sail in your answer.



.....

.....

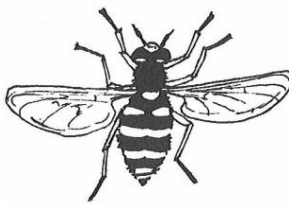
1 mark

3. Mini-beasts

(a) Some children find four mini-beasts.

They make a table about their observations.

Complete **Table 1** below by adding the names of these four mini-beasts.



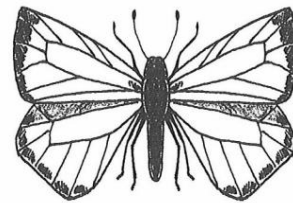
hoverfly



spider



ant



butterfly

Table 1

Name	Legs	Wings	Antennae
.....	6	4	2
.....	6	2	2
.....	6	0	2
.....	8	0	0

1 mark

- (b) The children have some ideas about where to put the mini-beasts when they have finished studying them.

Tick **ONE** box to show where the children should put the mini-beasts.



in a safe place
away from the road

in a pot with food
and water

in the place where
they were found

in a dark place
under a log

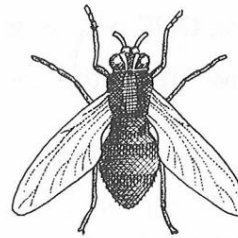
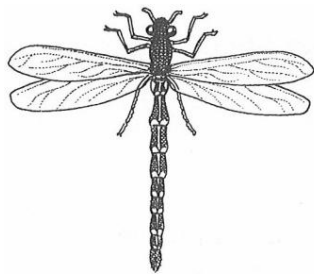
1 mark

(c) The children find more mini-beasts and make a new table.

Table 2

Name	Legs	Wings	Antennae	Notes
crane fly	6	2	2	long thin tail
dragonfly	6	4	2	long thin tail
housefly	6	2	2	none
tiger moth	6	4	2	hairy body

Use **Table 2** to help you name these two mini-beasts.



(i)

(ii)

1 mark

(d) It would be easier to name the mini-beasts if the children made a key.

Tick **TWO** boxes to show which features would be useful in a key to separate the four mini-beasts in **Table 2**.

Tick **TWO** boxes.



has 6 legs

has a long thin tail

has 4 wings

has 2 antennae

1 mark

4. Isaac Newton

(a) Isaac Newton was a famous scientist who was born in 1642.



There is a famous story about Newton watching an apple fall from a tree.

Newton thought a force must cause the apple to fall.

Tick **ONE** box to show which force on the apple causes it to fall down from the tree.



a pulling force
towards the tree

a pushing force
from the apple

a pulling force
towards the Earth

a pushing force
from the air

1 mark

(b) Newton did different investigations to test his ideas.

Why was it important for Newton to test his ideas using investigations?



.....
.....

1 mark

(c) Newton realised that the force which made the apple fall to the ground also causes the Earth to orbit the Sun.

Name the force that causes the Earth to orbit the Sun.



.....

1 mark

(d) How long does the Earth take to orbit the Sun once?



.....

1 mark

(e) How does the Earth **move** to cause day and night?



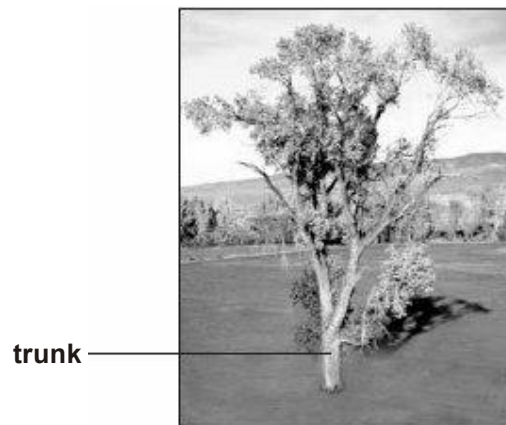
.....

.....

1 mark

5. Trees

(a) The thick woody stem of a tree is called a trunk.



Give **ONE** function of the trunk for the tree.



.....

1 mark

(b) Trees make food for growth.

Which part of the tree makes food for growth?



.....

.....

1 mark

- (c) Trees do not grow quickly during the winter. One reason trees do not grow quickly in the winter is because it is cold.

Give a **different** reason to explain why trees do not grow quickly in the winter.



.....

1 mark

- (d) Class 6 collects leaves that have fallen from some trees.



They write a key which identifies the leaves they collected.

Key to identify leaves

1.	Leaf has a smooth edge.....go to 2 Leaf has a bumpy or jagged edge.....go to 3
2.	Leaf is long and thin..... Weeping willow Leaf is not long and thin..... Alder buckthorn
3.	Leaf is heart shaped..... Silver lime Leaf is not heart shaped.....go to 4
4.	Leaf is round..... Aspen Leaf is not round..... Norway maple

Use the key to identify the two leaves below.



(i)

(ii)

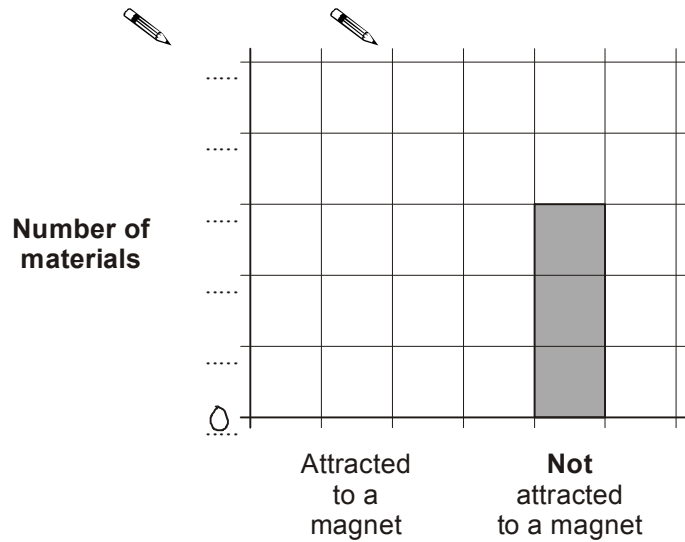
2 marks

6. Magnets

- (a) Some children investigated whether or not some materials are attracted to a magnet. They made notes of their results.

Attracted to a magnet	Not attracted to a magnet
Iron nail Steel clip.	Metal coin, Chocolate, Modelling clay.

- (i) Write the numbers to show the scale on the chart below. A number has been done for you.



1 mark

- (ii) Draw a bar on the chart to show the number of materials attracted to a magnet.

1 mark

- (b) Jane wrote 'Our investigation was good' as her conclusion for the investigation.

Why is this **not** a useful scientific conclusion?



.....
.....

1 mark

(c) Ali and Jane describe their ideas about metals.



Jane recorded some observations from their investigation in a table.

Does each observation support their ideas?
Tick **ONE** box on each row of the table.



Observation	Supports Ali's and Jane's ideas	Supports only Jane's idea	Does not support either idea
The iron nail is attracted to the magnet.			
The steel clip is attracted to the magnet.			
The metal coin is not attracted to the magnet.			
The modelling clay is not attracted to the magnet.			
The chocolate is not attracted to the magnet.			

2 marks

- (d) Ali said 'To improve our test we should have measured how far each material moved when it was attracted to the magnet'.
Jane said 'This would not improve our test'.

Why was Jane right to think this would **not** improve their test?



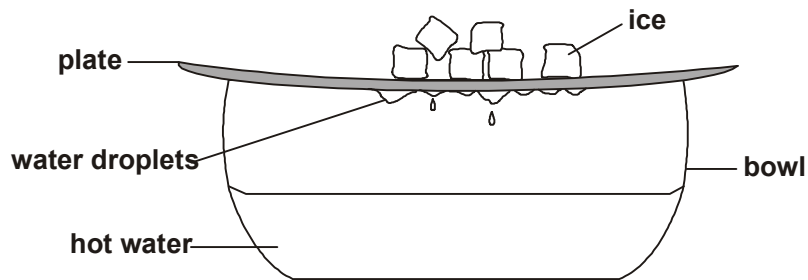
.....
.....

1 mark

7. Ice experiments

- (a) Safia and Josh are doing experiments with ice cubes.

First Safia puts ice cubes on a plate over a bowl of hot water.



After some time, Safia sees droplets of water drip from underneath the plate. Water from the melting ice **cannot** pass through the plate and the bowl has not moved.

Explain how the water droplets formed in the bowl underneath the plate.



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

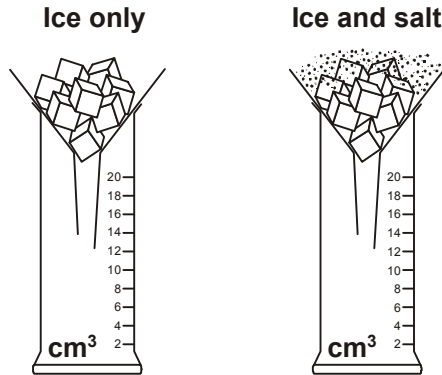
2 marks

(b) In winter, people put salt on the road to make the ice melt.

Josh investigates the effect of salt on melting ice.

He puts the same amount of ice in two funnels.

He adds salt to the ice in **one** funnel.

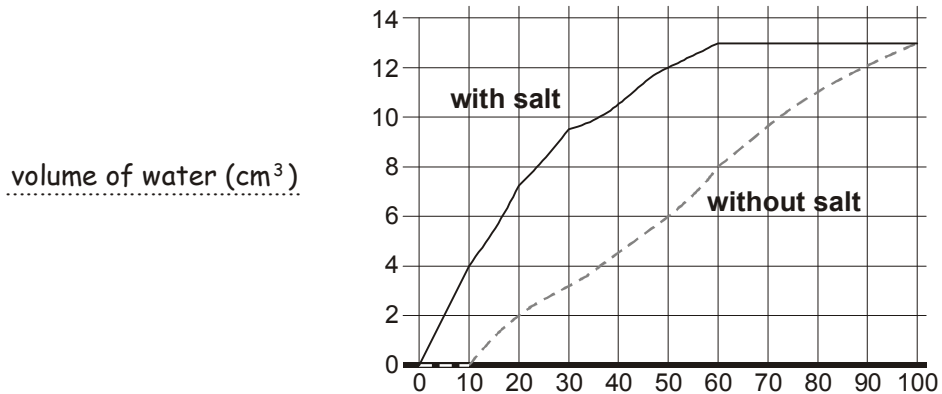


The ice starts to melt. Every ten minutes, Josh measures how much water is in each cylinder.

The graph below gives Josh's results.

One axis on the graph has been labelled.

Write the label and the units for the **other** axis.



..... ()

1 mark

(c) What has Josh found out about the effect of salt on melting ice?



.....

1 mark

- (d) Josh concludes 'The more salt I add, the steeper the line on the graph will be'. Josh's results on the graph do not support his conclusion.

Tick **ONE** box to show why his results **do not** support his conclusion.



The line on the graph did not get steeper.

He used the same amount of ice each time.

He did not try different amounts of salt.

He only measured the water every ten minutes.

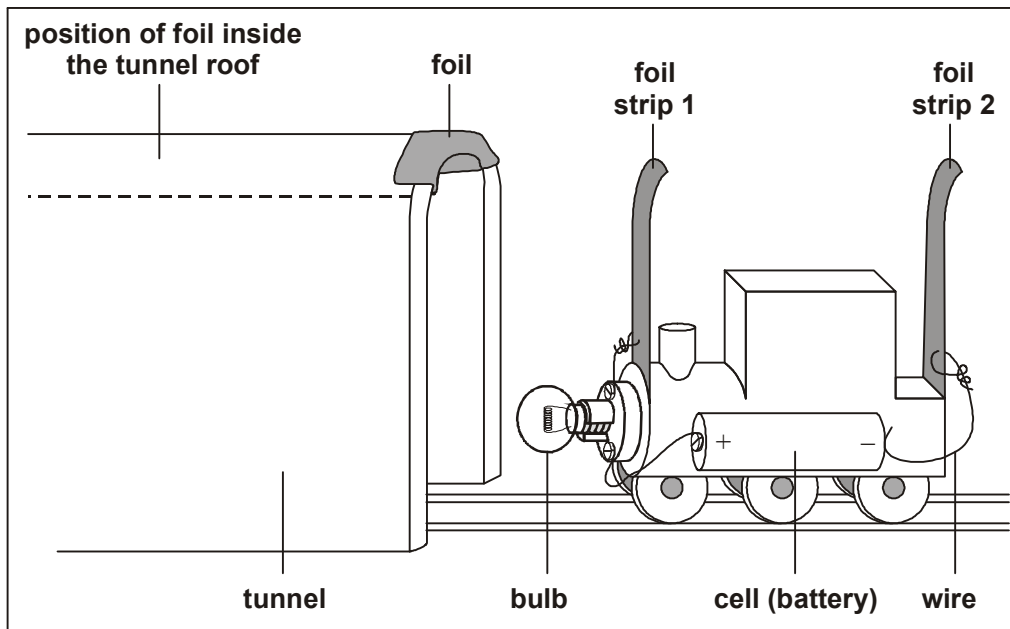
1 mark

8. Train in the tunnel

- (a) Andrea wants a light bulb to light up when her toy train is pushed through a tunnel. She makes an electric circuit for her toy train.

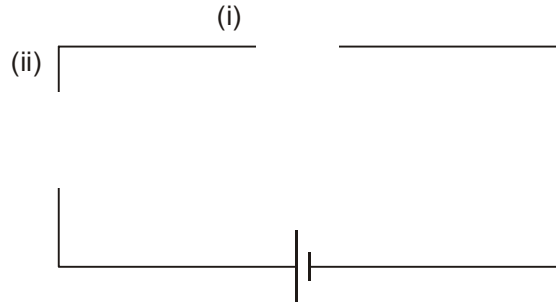
Andrea makes a tunnel and puts a strip of foil inside the tunnel roof.

The picture shows Andrea's tunnel and the wiring on her train.



The foil strips on the train act like a **switch**. When both foil strips on the train touch the foil inside the tunnel roof, the bulb lights up.

Complete the circuit diagram below by drawing the **switch** and the **bulb** to show the circuit on Andrea's train.



2 marks

- (b) Give **ONE** property of metal foil which makes it a good material for Andrea to use as a switch.



.....

1 mark

- (c) When only one foil strip on the train is touching the foil in the tunnel, the bulb **does not** light up.

Complete the sentence to explain why the bulb **does not** light up.



The circuit

1 mark

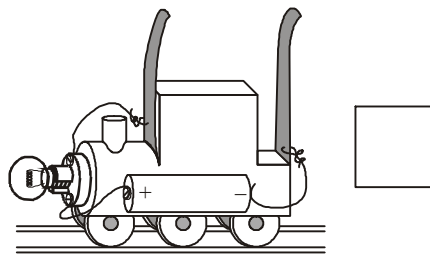
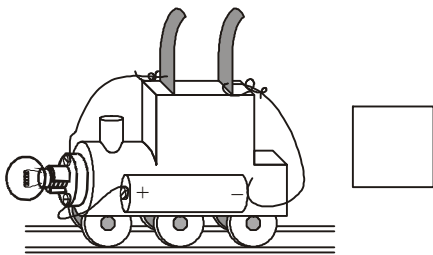
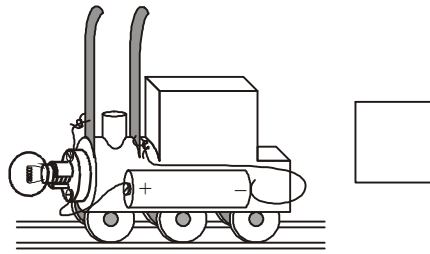
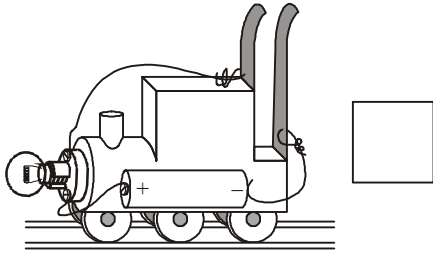
(d) The bulb on the train only lights up when **all** of the train is inside the tunnel.

Andrea wants to improve her circuit so the bulb lights up when the train has only just entered the tunnel.

Which train has foil strips that would allow the bulb to light when the train has only just entered the tunnel?



Tick **ONE** box.



1 mark