

Sc

KEY STAGE

2

LEVELS

3-5

2010

# National sampling for science

## Test B



\*0510SB\*

First name \_\_\_\_\_

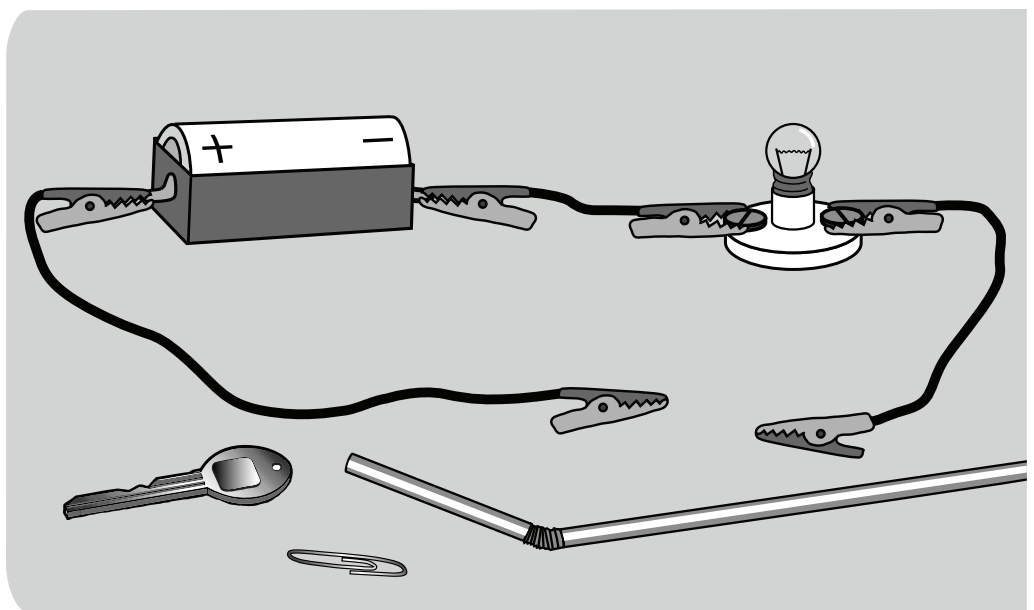
Middle name \_\_\_\_\_

Last name \_\_\_\_\_

Date of birth      Day                      Month                      Year

Please circle one      Boy                      Girl

School \_\_\_\_\_



\*0510SB01\*

**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.



**Do not write on this page.**

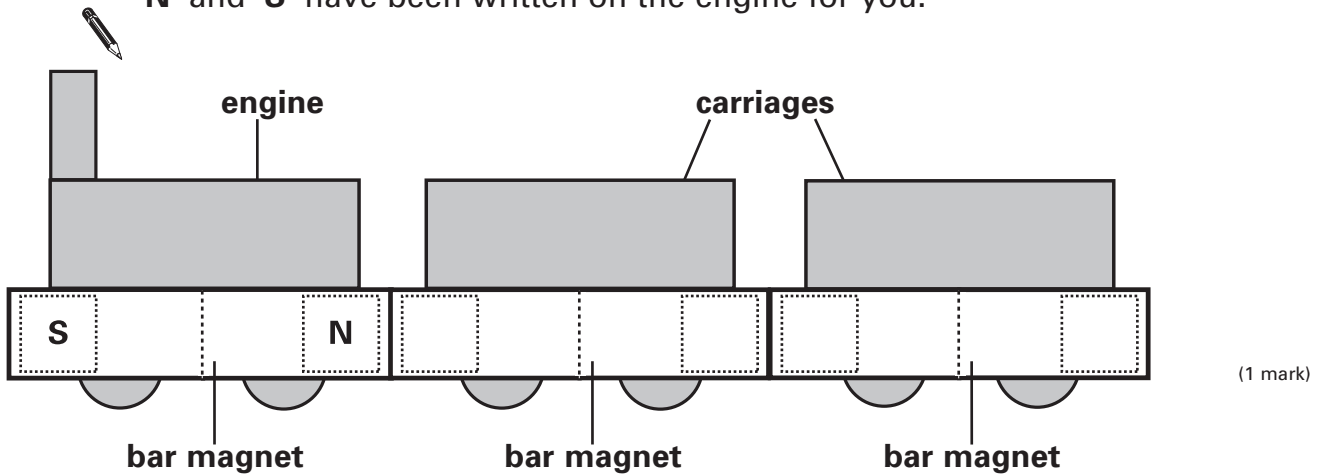


# 1 Magnets

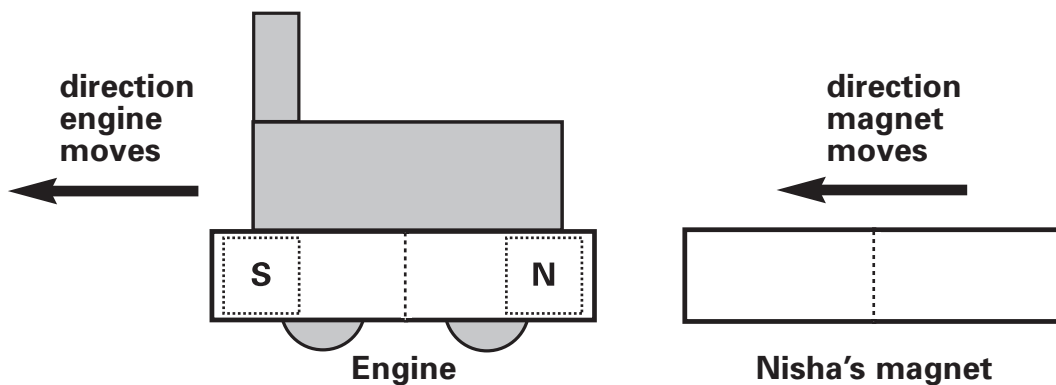
- (a) Liam has a toy train with two carriages. It has bar magnets to join the carriages to the engine as shown below.

Write 'N' (north) and 'S' (south) on the end of each bar magnet so the carriages join to the engine.

'N' and 'S' have been written on the engine for you.



- (b) Nisha moves a different bar magnet towards the magnet on the engine. The magnets do not touch each other. The engine moves away from Nisha's magnet.



Explain why the train engine moves away from the bar magnet.



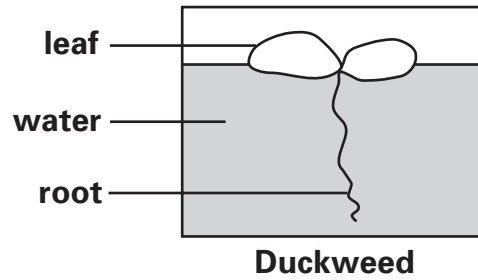
.....  
.....

(1 mark)



## 2 Duckweed

- (a) Duckweed is a plant that floats on the water in ponds.



The root of the duckweed keeps the plant stable and reduces movement across the pond.

What other function does the root have?



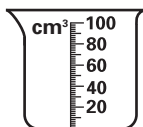
.....

(1 mark)

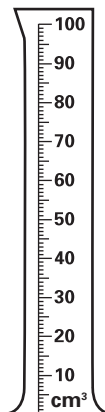
- (b) Mandy wonders if duckweed reproduces more quickly if it gets more light. She does an investigation to see if this is true.

Mandy fills identical jars with  $75 \text{ cm}^3$  of water.

Which piece of equipment is most accurate for measuring  $75 \text{ cm}^3$  of water? Tick **ONE** box.



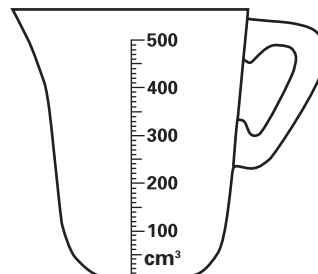
Beaker



Measuring cylinder



Spoon



Jug

(1 mark)



- (c) Mandy puts one duckweed plant in each jar.



She puts each jar in sunlight for a different amount of time. When the jars are not in the sunlight, they are kept in a dark cupboard.

Mandy predicts how many duckweed plants will be in her jars at the end of the week.

Complete the table by predicting how many duckweed plants there will be if the duckweed reproduces more quickly when it gets more light.



Amount of sunlight (hours per day)	Number of duckweed plants at the end of the week
0	
6	4
10	

(1 mark)

- (d) Why is it important for Mandy to do an investigation to test her idea? Tick **ONE** box.



so she can collect evidence

so she can learn about the duckweed's food chain

so she can protect the environment

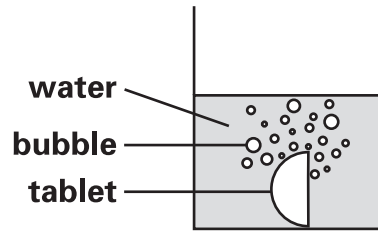
so she can identify what type of duckweed it is

(1 mark)



### 3 Rocket

- (a) Jonathan puts half a vitamin C tablet into some cold water. It bubbles in the water.



**Circle** the correct word in each box to complete the sentences below.



- (i) The bubbles show that a \_\_\_\_\_ is produced.

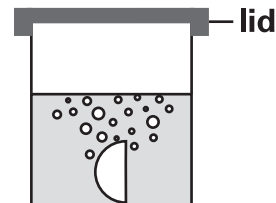
**solid**  
**liquid**  
**gas**

- (ii) This change is \_\_\_\_\_

**reversible.**  
**not reversible.**

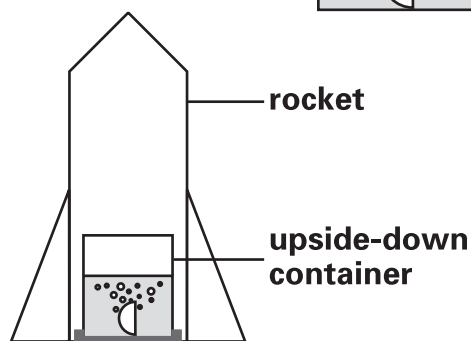
(1 mark)

- (b) Jonathan puts a tight lid on the container. After a short time the lid pops off the container.



Jonathan uses the container to launch a rocket.

To stay safe, he stands well away from his rocket when it goes up in the air.



Tick **ONE** box to show why Jonathan must stand well away from the rocket to stay **safe**.



He might get burnt.

The lid might come off.

His shoes might get wet.

He is not sure where the rocket will go.

(1 mark)








(c) Jonathan times how long it takes the rocket to launch into the air with different amounts of tablet.

He launches the rocket three times with each amount of tablet.

The table below shows his results.

Amount of tablet	Time for rocket to launch (seconds)		
	1st	2nd	3rd
quarter 	14	16	15
half 	11	12	12
whole 	5	5	6

What is the relationship between the **amount of tablet** and the **time taken** for the rocket to go up?



.....  
.....

(1 mark)

(d) Predict how long the rocket would take to go up if **two whole** tablets were used. Use the table to help you.



..... seconds

(1 mark)

(e) Tick **ONE** box to show a different mixture Jonathan could use to make his rocket go up.



vinegar and sugar

water and sugar

vinegar and bicarbonate of soda

water and bicarbonate of soda

(1 mark)

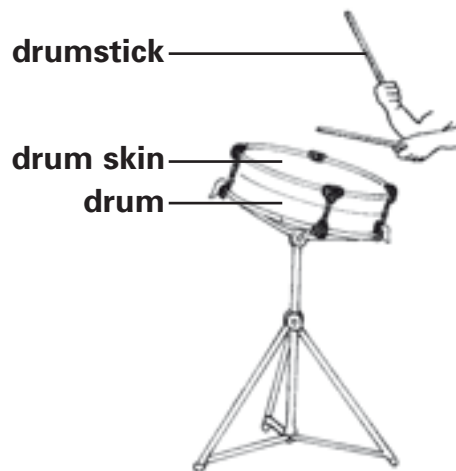


# 4 Drums

- (a) This is a picture of a famous musician.  
Her name is Evelyn Glennie. She plays the drums.



Evelyn moves the drumstick downwards to hit the drum skin.  
Then the drumstick bounces back up.



Tick **ONE** box to show what force causes the drumstick to bounce up after it has hit the drum skin.



a pushing force  
from the drum skin

a pushing force  
from gravity

a pulling force  
from the drum skin

a pulling force  
from gravity

(1 mark)



(b) Evelyn is deaf. She cannot hear the drum with her ears.

When she has bare feet, she can feel the drum's sound with her feet.

The sound can travel from the drum through the air to Evelyn's feet.



Name **ONE other** thing that the sound can travel through from the drum to get to Evelyn's feet.



.....

(1 mark)

(c) What can Evelyn feel with her feet when the drum makes a sound?



.....

(1 mark)

(d) Evelyn can change the way she plays the drum. She can make the sound get louder or higher.

Tick **ONE** box on each row of the table to show if the sound will get louder or higher.



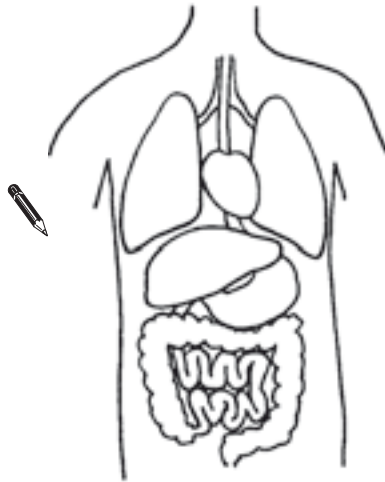
How Evelyn plays the drum	The sound...		
	gets higher.	gets louder.	does not get higher or louder.
with a tighter drum skin			
hit the drum with more force			
hit the drum faster with the same force			

(1 mark)



## 5 Keeping warm and healthy

- (a) Look at the picture showing the inside of the human body.



- (i) Put a cross, X, on the organ in the picture that pumps blood around the body.

- (ii) Name the organ that pumps blood around the body.

.....

(1 mark)

- (b) Hassan knows that some activities can affect our pulse rates.

Tick **TWO** boxes below to show the **two** activities that would increase pulse rate the most.



having a rest

eating fruit

writing a letter

playing football

going for a walk

drinking water

(1 mark)

- (c) Tick **ONE** box to show the usual units of measurement for pulse rate.



beats

beats per second

beats per minute

beats per hour

(1 mark)



(d) Hassan is interested in how temperature affects pulse rate.

He measures the pulse rates of 6 children sitting in the playground on a cold day.

He then measures the pulse rates of the same 6 children after they have sat in a warm classroom for 10 minutes.

Hassan records his results in the table below.



	Children					
	A	B	C	D	E	F
Pulse rate in cold playground (units)	72	68	76	75	67	70
Pulse rate in warm classroom (units)	80	75	82	80	70	75

Describe **ONE** thing Hassan did in his investigation so he could be sure of his conclusion.



.....  
.....

(1 mark)

(e) Use the table to write a conclusion for Hassan's investigation.



.....  
.....

(1 mark)



## 6 Moon trip

- (a) Astronauts travel to the Moon in a spacecraft.  
Rocket engines push the spacecraft away from the Earth.

What name is given to the force that tries to pull the spacecraft back to Earth?



.....

(1 mark)

- (b) From the Earth, the Moon looks like a circle.  
The astronauts know this is not its real shape.



What shape is the Moon?



.....

(1 mark)

- (c) The Moon orbits the Earth.

Tick **ONE** box to show how many days it takes the Moon to orbit the Earth.



1 day

7 days

28 days

365 days

(1 mark)



- (d) The astronauts can see the Earth from space. On one half of the Earth it is night. On the other half it is day.

How does the Earth move to cause night and day?



.....  
.....

(1 mark)

- (e) Plants do not grow on the Moon.  
Growth is one of the life processes of plants.

Name **another** life process of plants.



.....

(1 mark)

- (f) Plants cannot live on the Moon. Some of the conditions on the Moon stop plants carrying out all their life processes.

Tick the **TWO** conditions which stop plants carrying out their life processes on the Moon.

Tick **TWO** boxes.



There is sunlight.

There are minerals in the rocks.

There is no rain.

There is no air.

(1 mark)



# 7 Baby's bottle

(a) Robert's baby sister drinks warm milk from a bottle.

Robert thinks he can keep the milk warm for longer by wrapping the bottle up.



He has four bottles.

He wraps three bottles with different materials. He does not wrap one bottle.



**Not wrapped**



**Wrapped in wool**



**Wrapped in cotton**



**Wrapped in paper**

Why does Robert have one bottle that is **not** wrapped with material?



.....  
.....

(1 mark)

(b) What is the scientific name given to a material that does **not** allow heat to pass through it quickly?



.....

(1 mark)

(c) What variables should Robert keep the **same** to make his test fair? Tick as many boxes as you need.



size of bottle

number of layers of material wrapping the bottle

volume of milk in bottle

type of material wrapping the bottle

(1 mark)





(d) Robert records his results in a table.

Material used to wrap bottle	Temperature (°C)				
	at start	after 30 minutes	after 60 minutes	after 90 minutes	after 120 minutes
Bottle A: not wrapped	45	40	35	31	28
Bottle B: wool	45	44	42	40	38
Bottle C: cotton	45	41	37	35	33
Bottle D: paper	45	40	36	33	30

Tick **ONE** box to show which bottle kept the milk warmest.  
Use the data in the table to help you.



A       B       C       D

(1 mark)

(e) Robert has a frozen ice lolly.

He wants to stop the ice lolly from melting for as long as he can.

Think about Robert's results for the bottles of milk.

(i) Tick **ONE** box to show which material would stop the ice lolly from melting for the longest time.



wool       cotton       paper

(ii) Explain why the material you chose will stop the ice lolly from melting for the longest time.



.....  
.....

(1 mark)



## 8 Tomatoes

Laura has four brands of tomato seeds.

She wants to know which brand of tomato seed grows best.



You must investigate which brand of tomato seed grows best.

You can use the draft box below to plan your investigation.



Use your draft to help you complete the plan for your investigation on the next page.



**My planning sheet for the investigation with tomato seeds.**

(a) The variable I will change in my investigation is:



.....

(1 mark)

(b) The variable I will measure in my investigation is:



.....

(1 mark)

(c) **ONE** variable I will keep the same to make my test fair is:



.....

(1 mark)

(d) In the table below, write the headings you would use for the **results table** in your investigation.



.....	.....
Lee's Seeds	<i>This part would not be filled in until you had done your investigation.</i>
Farmer King's	
Aunt Dora's	
Kathy's Seeds	

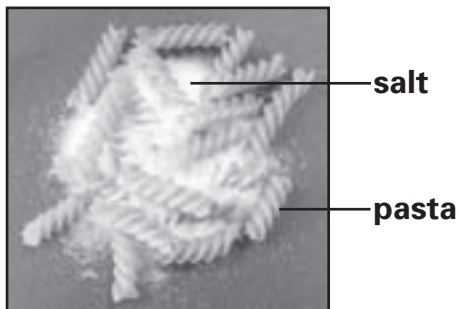
(2 marks)



## 9 Separating salt

- (a) Some children are investigating separating salt mixtures.

Josh wants to separate a mixture of salt and dry **pasta**. He decides to use a sieve.



What feature of the salt and pasta allows Josh to separate them with a sieve?



.....

.....

(1 mark)

- (b)



Grace wants to separate a mixture of salt and **sand**. She adds water to the salt and sand. The salt dissolves.

- (i) How could Grace separate the sand from the salty water?



.....

(1 mark)

- (ii) How could Grace separate the salt from the water?



.....

(1 mark)



(c) Caleb has a mixture of salt and **sugar**.  
He thinks about how to separate the  
salt and sugar.



I could add water to dissolve the salt.

Explain why adding water to dissolve the salt will **not** help  
Caleb separate a mixture of salt and sugar.



.....

(1 mark)



**END OF TEST**

**Please check your answers.**

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