

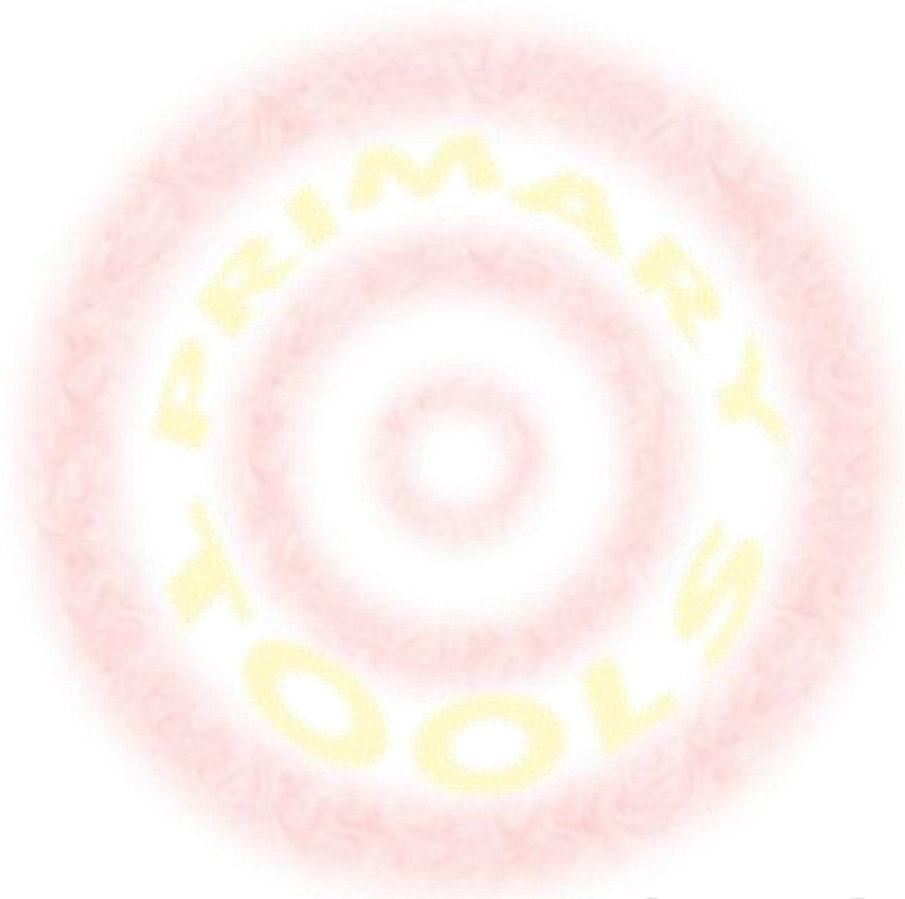
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Name: _____

Date: _____



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Year 5 End of Year Science Test

1. Balanced Diets

(a) A class carries out a survey to find out how often the children eat vegetables.

Tally chart to show how often the children eat vegetables

How often?	How often?
more than once a day	HHH /
once a day	HHH / / / /
once a week	HHH HHH /
less than once a week	/ / /
never	/

Use the tally chart. How many children eat vegetables more than once a day?



.....

1 mark

(b) Eleven children gave the same answer as each other.

Use the tally chart to find out what answer these eleven children gave.



.....

1 mark

(c) In a balanced diet, each food group has a special function in the body. Each food below is a good source of something the body needs.

Draw THREE lines below to match each food to its special function.



Food

Function: Good source of...

carrots and oranges

fuel for activity.

chicken and eggs

new material for growth.

bread and cakes

vitamins for health.

1 mark

(d) Nasreen makes a poster to show how to stay healthy. Only some of the ideas on her poster are good.

Tick TWO boxes to show the best ideas on the poster below.



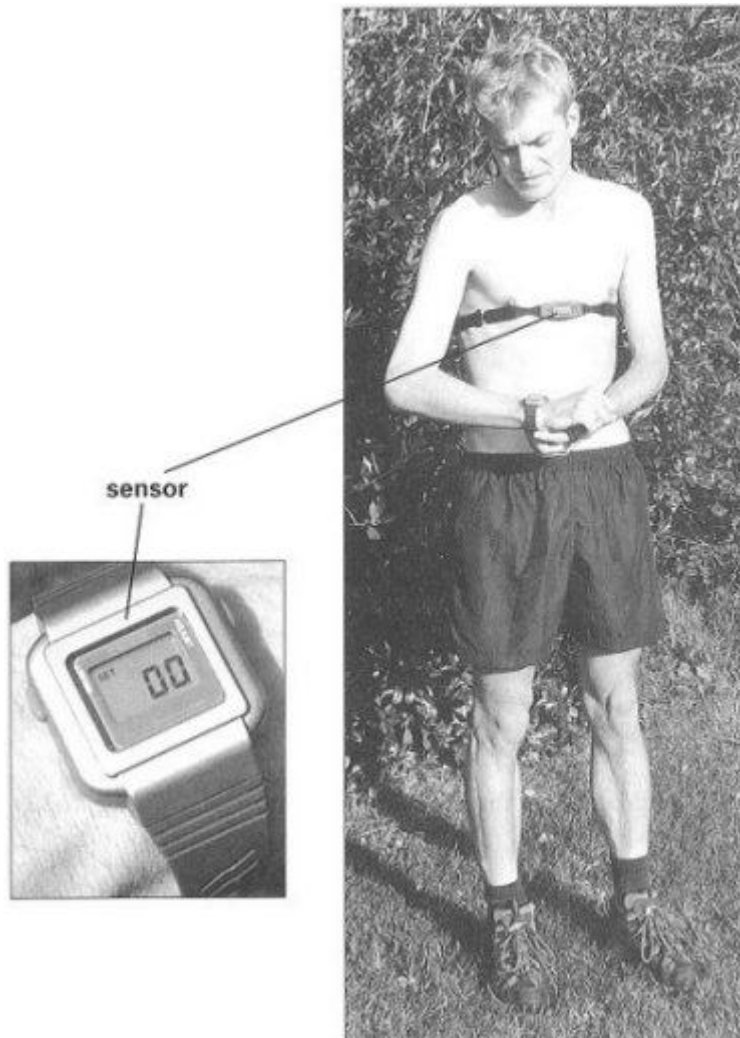
To stay healthy you should:

- eat lots of fried food.
- eat different kinds of food.
- smoke every day.
- exercise often.

1 mark

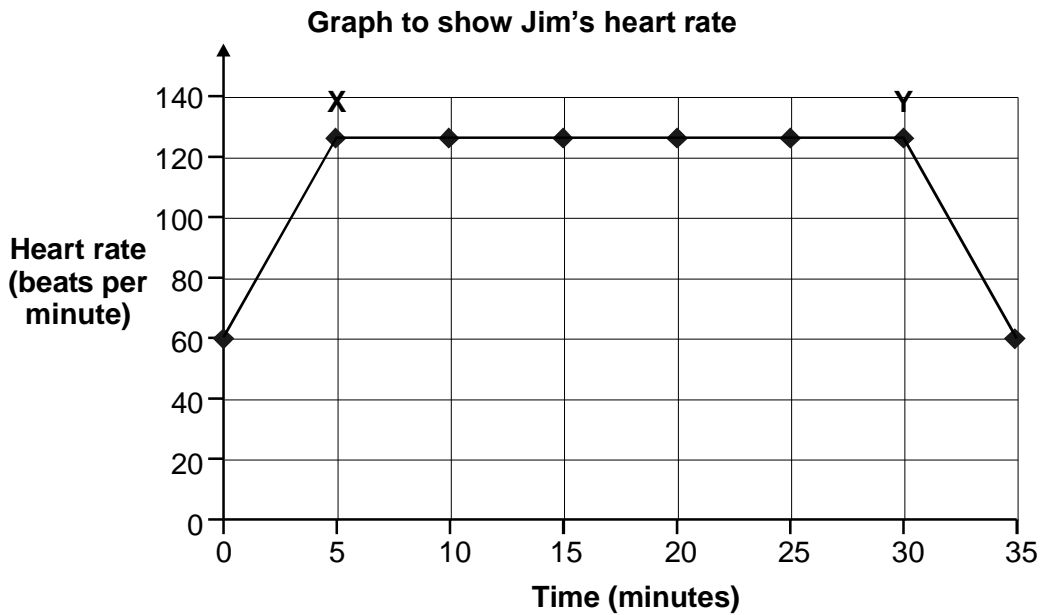
2. Heart Rate

Jim uses a sensor to measure his heart rate before he starts running.



He starts running and measures his heart rate every five minutes.

After his run, he draws a graph.



Use the graph to help you answer these questions.

(a) What is Jim's heart rate **before** he starts running?



..... beats per minute

1 mark

(b) What happened to Jim's heart rate in the first five minutes that he was running?



.....

1 mark

(c) Describe Jim's **heart rate** between points **X** and **Y** on the graph.



.....

1 mark

3. Germinating Seeds

(a)



These children have recorded their observations about lettuce seeds germinating at three temperatures.

They planted the same number of seeds at each temperature.



Temperature (°C)	Total number of lettuce seeds germinated					
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6
5	0	0	0	1	1
15	0	0	0	1	5	9
25	0	2	8	13	17	19

Complete the table to show how many seeds germinated at 5°C on Day 3.

1 mark

(b) The children were trying to find out something about seeds.

What question were the children investigating?



.....

.....

1 mark

(c) The children discussed the results in the table.

Look at their results table to decide whether each conclusion is **true**, **false** or you **can't tell**.

Tick **ONE** correct box for each conclusion.



	True	False	Can't tell
The quickest germination was at 25°C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At 25°C all the seeds germinated by Day 6.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5°C is too cold for seeds to germinate.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The best temperature for germination was 15°C.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2 marks

(d)

Alan made a prediction:



The best temperature to germinate **any** kind of seed is 25°C.

Faiza said:



You have not collected enough information to support your prediction.

(i) Who do you agree with?

Tick **ONE** box.



agree with Alan

agree with Faiza

disagree with Alan and Faiza

(ii) Explain your answer.



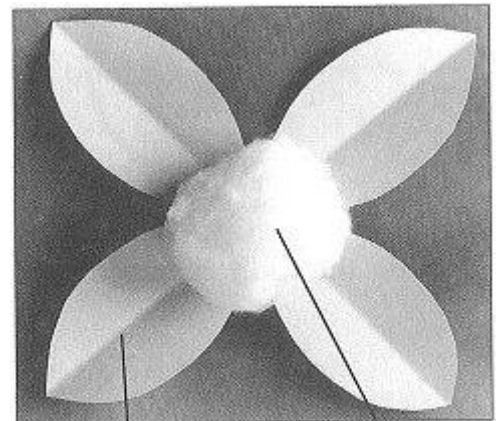
.....
.....

1 mark

4. Flowers and Bees

Kate and Simeon want to find out which colour flowers bees will visit most. They make model flowers of different colours.

Bees feed on nectar from flowers.



coloured card

cotton wool with nectar




Kate and Simeon make their own nectar using 40g of sugar and 100cm³ of water.

They put 10 drops of nectar in the centre of each model flower.

They put their flowers outside then count the bees that visit the flowers. They keep a record of the weather for each hour.



(a) Here are the children's results.

Colour of flower	Number of bees each hour		
	9am–10am sunny 	10am–11am sunny and cloudy 	11am–12noon cloudy 
red	4	3	2
blue	8	6	3
white	4	4	1
yellow	6	5	2

Which colour of flower do the bees visit most?



.....

1 mark

(b) Use the information on the table to say how the amount of **sunshine** affects the **number** of bees that visit the flowers.



.....

.....

2 marks

(c) Write **TWO** things that the children could keep the same to help make their test fair.



(i)

1 mark

(ii)

1 mark

5. Solids, liquids and gases

(a) Megan has three cups.

There is a solid in one cup, liquid in another, and gas in another.

Megan writes a description of what is in each cup.

Draw **THREE** lines to match solid, liquid and gas to the best description of what is in each cup.



solid

Description

I cannot see anything inside the cup.

liquid

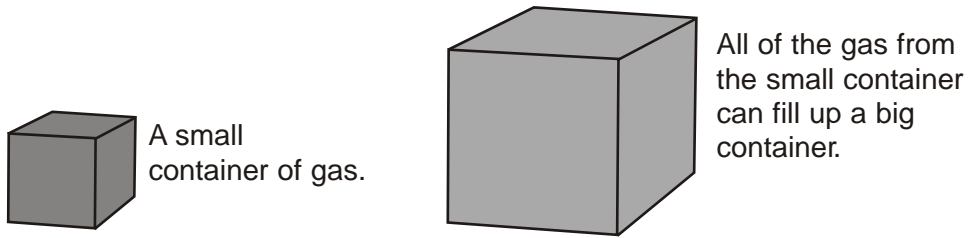
I cannot pour the material out of the cup.

gas

When I move the cup, the material changes shape.

1 mark

(b) Megan's teacher says gases spread out to completely fill up any container.



Write **yes** or **no** in each row to complete the table.



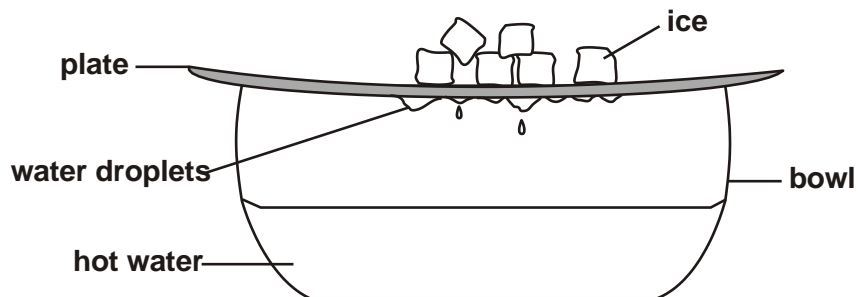
	Do they spread out to completely fill up any container?
Gases	yes
Liquids	
Solids	

1 mark

6. 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.



.....

.....

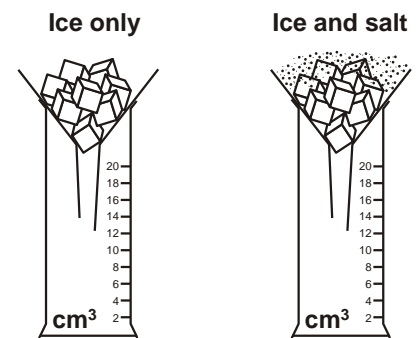
.....

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.

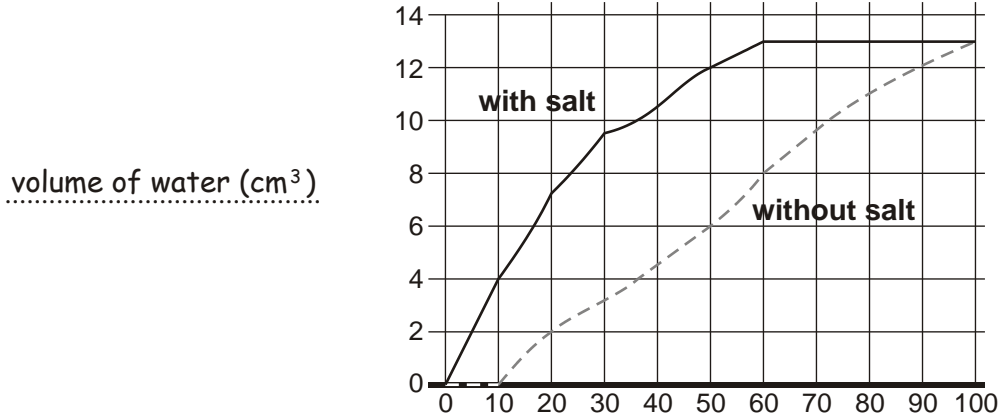


The ice starts to melt. Every ten minutes, Josh measures how much water is in each cylinder.

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.



.....
volume of water (cm³)

..... (.....)

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.

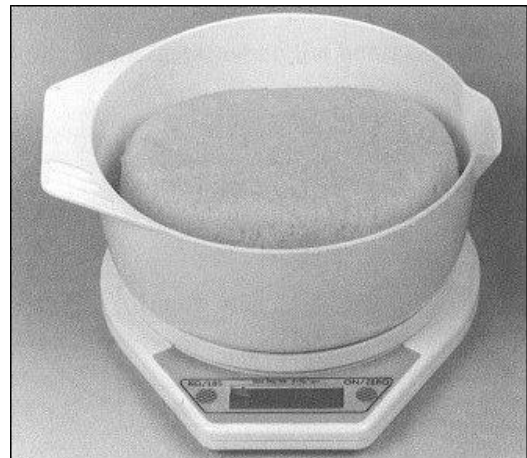
He did not try different amounts of salt.

He only measured the water every ten minutes.

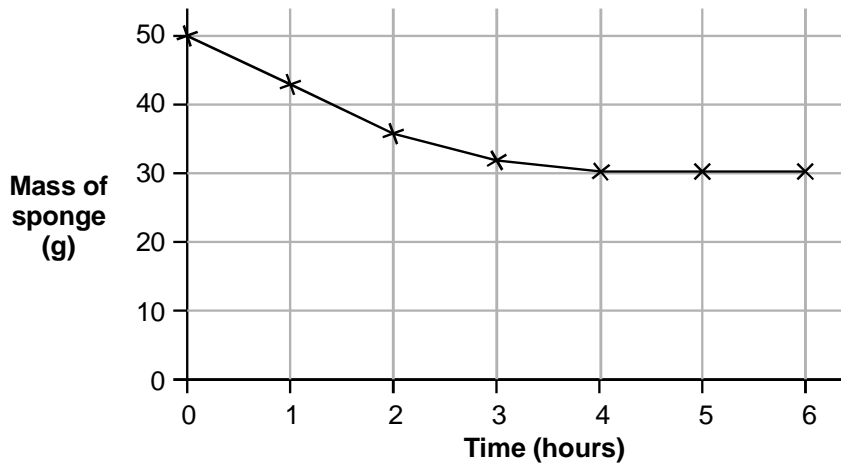
1 mark

7. Drying sponge

(a) Dinesh puts a wet sponge on some scales. He records its mass during the day.



He draws a graph of his results.



What is the mass of the wet sponge at the start of the investigation?



..... g

1 mark

(b) Describe how the mass of the wet sponge changes over the first four hours.



.....

1 mark

(c) What process causes the mass of the drying sponge to change?



.....

1 mark

(d) What is the mass of the dry sponge?



..... g

1 mark

(e) Some other children discuss Dinesh's results.
Look at their ideas below.

Use the graph to help you write **true** or **false** next to each idea.

The sponge dried most quickly in the first two hours.



Bob Ruth

The sponge was still drying after five hours.



Komal

There was 20g of water in the sponge at the start.



1 mark

8. Ice cubes

(a) Scott makes ice cubes.

He pours water into an ice cube tray.



Scott puts the ice cube tray into the freezer.

The temperature of the water changes when it is in the freezer.

What happens to the temperature of the water after it is put in the freezer?



.....

1 mark

(b) Name **ONE** piece of equipment Scott could use to measure the temperature of the water.



.....

1 mark

(c) The water in the ice cube tray freezes and becomes ice.

Write **true** or **false** next to each statement about freezing.

True or false?



Water freezes at 100°C.

.....

Freezing water is a reversible change.

.....

Freezing is a change from solid to liquid.

.....

1 mark

(d) Scott takes the ice cubes out of the freezer and puts some in a glass of water.

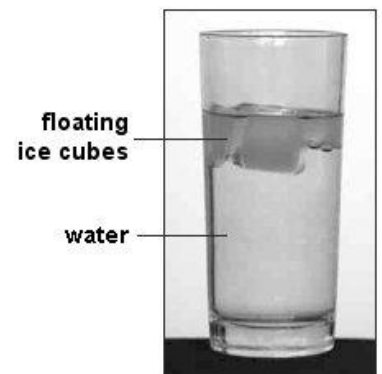
He leaves the glass in a warm room.

Name the scientific process that happens to the floating ice cubes after they are added to the water.



.....

1 mark



9. 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

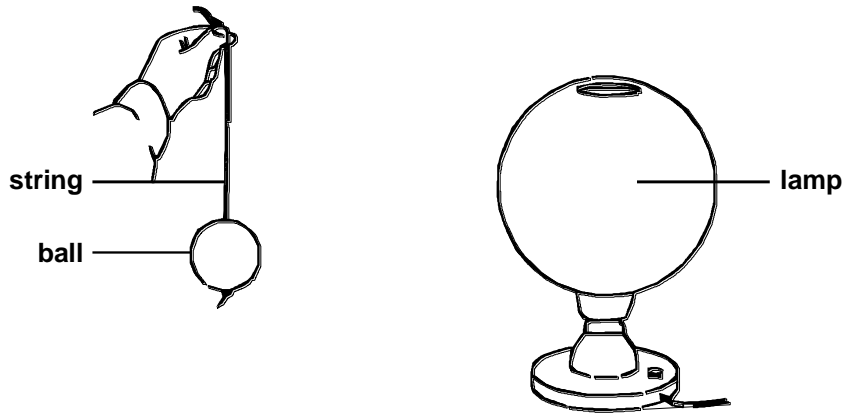
10. Earth and space

(a) **How long** does it take for the Earth to orbit the Sun?



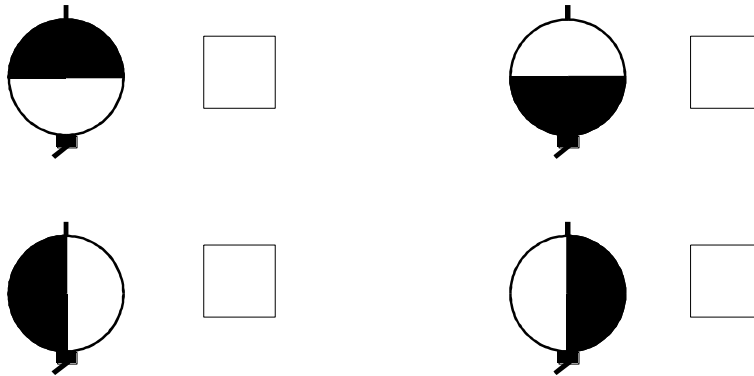
1 mark

(b) Jan makes a model of the Earth and the Sun to show day-time and night-time. She uses a lamp for the Sun and a ball for the Earth.



Which of the following correctly shows day and night in this model?

Tick **ONE** box.



1 mark

(c) How must Jan move the ball to show how one place on Earth has **day-time** and **night-time**?

Tick **ONE** box.



walk with the ball around the lamp

spin the ball on the string

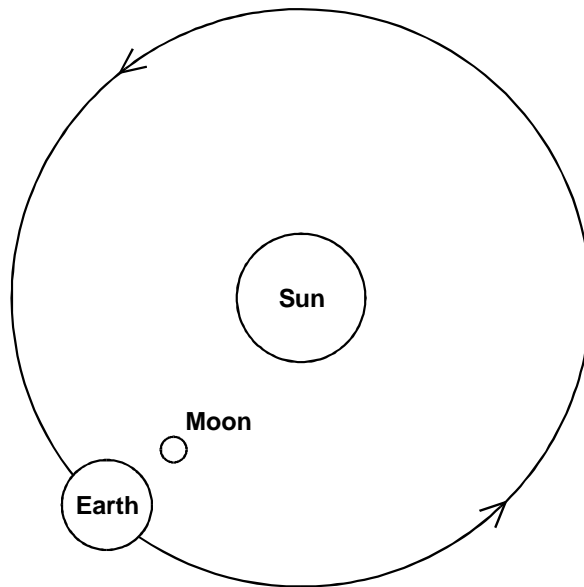
swing the ball backwards and forwards

hold the ball lower then higher

1 mark

(d) Jan draws this diagram to show how the Earth orbits the Sun.

Draw the orbit of the Moon on Jan's diagram.

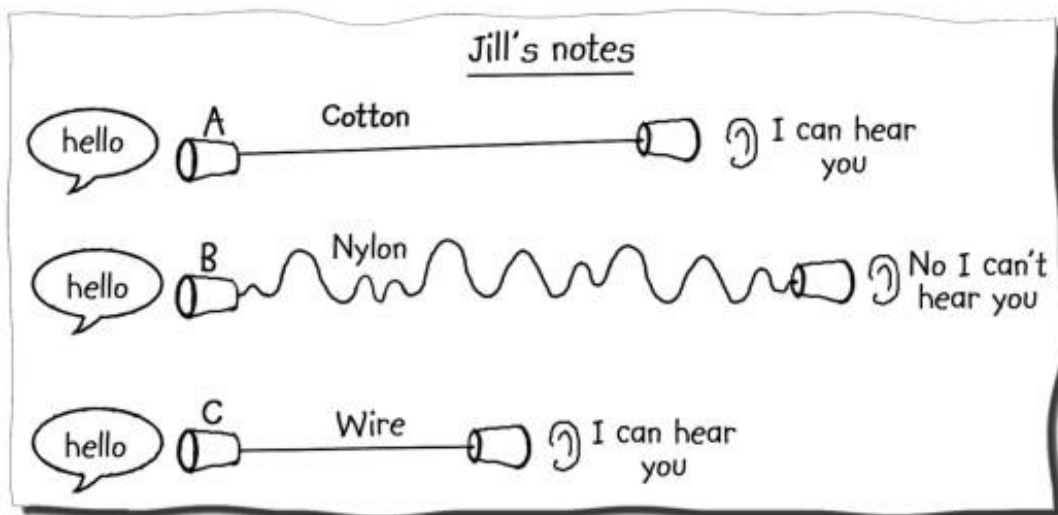


1 mark

11. Travelling sounds

(a) Jill investigated whether or not sound travelled through different materials.

She made three telephones using plastic cups. She used different materials to connect the cups. One child talked through the telephone and Jill listened.



Look at Jill's notes of her investigation.

How many different materials did Jill test?



.....

1 mark

(b) What was the factor Jill observed or measured to collect her results?



.....

1 mark

(c) Jill changed three factors at the same time.

Complete the list to show the **THREE** factors Jill changed in this investigation

The first one has been done for you.

1. **The tightness of the line**



2

3

2 marks

(d) Why is it important to change only **ONE** factor at a time in an investigation?



.....

1 mark

(e) Jill carried out her investigation of sound travelling through different materials again. She made sure only one factor was changed.

Jill described her conclusion.



Jill's teacher said this was **not** a useful science conclusion for her investigation.

Why was Jill's conclusion **not** a useful science conclusion?



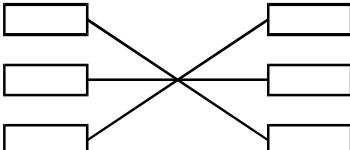
.....

.....

1 mark

1. (a) Award **ONE** mark for: 1(L3)
- 6;
 - six.

- (b) Award **ONE** mark for: 1(L3)
- (eleven) children said they eat vegetables once a week;
 - once a week.

- (c) Award **ONE** mark for: 1(L3)
- 

- (d) Award **ONE** mark for identifying the **two** best facts: 1(L4)

To stay healthy you should:	
	<input type="checkbox"/>
• eat different kinds of food.	<input checked="" type="checkbox"/>
	<input type="checkbox"/>
• exercise often	<input checked="" type="checkbox"/>

[4]

2. (a) Award **ONE** mark for 1
- 60/sixty beats per minute.

- (b) Award **ONE** mark for an indication that his heart rate **increased**: 1
- it went up/rose;
 - it got faster;
 - it went up quickly.

Allow:

- it got bigger.

If numbers are included in the answer, allow a response indicating that Jim's heartbeat rose (**from** 60) to between 121 and 139 beats per minute (inclusive):

- it went up to 125;
- it went from 60 to 130.

Do not give credit for a single reading:

- it was at 125.

Do not give credit for indicating or implying a starting

rate below 60 or a running rate above 139 beats per minute:

- it went up to 60 beats per minute.

(c) Award **ONE** mark for an indication that his pulse rate stayed **constant** (beats per minute do not need to be specified): 1

- it stayed (at) the same (rate);
- it stayed at about 125/130;
- it stayed the same number of beats per minute;
- it stayed the same for 25 (\pm 1) minutes.

Allow:

- it (heart rate) stayed at the same speed.

Do not give credit for:

- it stayed level [this describes the line on the graph, **not** Jim's heart rate];
- two points named ie X was 125, Y was 125;
- he was running at the same speed.

[3]

3. (a) Award **ONE** mark for: 1(L3)

- 0 [in correct cell in table].

Allow:

a correct response outside the table or in the wrong place in the table.

(b) Award **ONE** mark for identifying both the independent variable [the temperature] and one of the dependent variables [the (number of) seeds germinating **or** the time taken (to start) to grow]: 1(L4)

- how many seeds germinated at (different) temperatures?
- how many seeds (started to) grow at (different) temperatures?
- how long it takes lettuce seeds to (start to) grow/germinate at different temperatures?

Allow:

- how does temperature affect germination?
- how many seeds came up at each temperature?
- what is the best temperature for seeds to grow?

Allow:

statements which are not framed as questions:

- the number of seeds germinating at each temperatures;
- the time taken for seeds to (start to) grow at different temperatures;
- the number of seeds that (start to) grow at different temperatures.

Do not give credit for an insufficient response giving a conclusion:

- *more seeds grew at higher temperatures.*

Do not give credit for questions identifying an incorrect independent variable or dependent variable:

- *which seeds grow at different temperatures?*

(c) Award up to **TWO** marks for **all four** correct: 2(L4)

	True	False	Can't tell
The quickest germination was 25°C.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
At 25°C all the seeds germinated by Day 6.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5°C is too cold for the seeds to germinate.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The best temperature for seeds to germinate was 15°C.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

or

If you are unable to award two marks, award **ONE** mark for **two** or **three** correct.

1

(d) Award **ONE** mark for **both** parts correct: 1(L5)

- agree with Faiza

AND

a response which shows an awareness that only one kind of seed has been tested or that all temperatures were not tested:

- they did not test different kinds of seed;
- they only tested one kind of seed;
- they only used lettuce seeds;
- they didn't test all other temperatures.

Allow:

- some seeds may need more heat to germinate;
- 25°C might be the best temperature for lettuce seeds;
- they might not have allowed sufficient time;
- you do not know what would happen if you left it longer.

Allow:

if neither box is ticked but the creditworthy explanation indicates that the pupils believe Faiza is correct, the mark may be awarded.

Do not give credit where a box other than 'agree with Faiza' is ticked.

Do not give credit for an insufficient response:

- *more information.*

[5]

4. (a) Award **ONE** mark for: 1
- blue.
- (b) (i) Award **TWO** marks for a **general** comparison describing the relationship between the **amount of sunshine** and **number** of visits to the flowers: 2
- the sunnier/brighter it was, the more bees visited the flowers;
 - fewer bees visited when it was cloudier;
 - the bees came more often when it was sunnier.

Do not give credit for an irrelevant or unwarranted interpretation of the data:

- *the nicer/better the weather the more bees came;*
- *the bees prefer sunny weather;*
- *there were more bees when it warmer/fewer bees when it was colder [the table does not give information about temperature].*

or

- (ii) If you are unable to award two marks, award **ONE** mark for two **specific** comparisons describing the relationship: 1
- more bees come in sunny weather, but fewer in cloudy weather;
 - the sunniest weather brings most bees and the cloudiest weather brings fewest bees.

Award **ONE** mark for a single comparison of the variables:

- when it is sunny, more bees come;
 - bees came most often when it was sunniest;
 - fewer bees came when it was cloudy.
- (c) (i) Award **ONE** mark for **each** of any **two** of the following variables which could be controlled: 2
- the nectar/amount of nectar/amount of sugar in the nectar;
 - arrangement/number of petals;
 - size/dimensions/area of petals/flowers;
 - amount of cotton wool;
 - positioning of flowers/environmental conditions;
 - density of distribution of flowers;
 - duration of test.

Allow:

- type of card;
- doing the test in good weather/same kind of weather;
- time of day.

Do not give credit for reference to the variable under investigation:

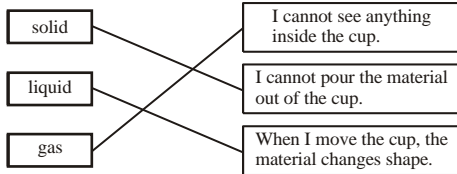
- colour of petals.

Do not give credit for reference to variables that are not under the children's control:

- the same type of bees;
- the temperature.

[6]

5. (a) Award **ONE** mark for correctly matching **all three** descriptions: 1(L4)



- (b) Award **ONE** mark for **both** rows of the table correctly completed: 1(L5)

	Do they spread out to completely fill up any container?
<i>Gases</i>	<i>yes [given]</i>
<i>Liquids</i>	no
<i>Solids</i>	no

[2]

6. (a) (i) Award **ONE** mark for a response that names or describes **evaporation:** 1(L5)

- the (hot) water evaporates;
- it changes into water vapour;
- it evaporates.

- (ii) Award **ONE** mark for a response that names or describes **condensation:** 1(L5)

- the water vapour condenses into liquid;
- the (cold) plate causes the evaporated water to condense;
- the water vapour turns back into liquid;
- it condenses.

ONE mark may be awarded for:

- it evaporates/changes into steam.

ONE mark may be awarded if evaporation is the only process named or described.

ONE mark may be awarded for:

- the steam condenses/changes into water.

ONE mark may be awarded if condensation is the only process named or described.

Do not give credit in both a)i) and a)ii) for a response that includes incorrect science indicating that the water comes

from the melting ice:

- water from the melting ice cubes drips through/underneath the plate.

Do not give credit in **either** a)i) **or** a)ii) for a response that includes incorrect science despite using the words evaporation and/or condensation:

- the gas evaporates and then condenses so that liquid forms under the plate [mark for a)i) only cannot be awarded];
- the water condenses because of the heat and turns into water vapour [mark for a)ii) cannot be awarded];
- the heat touches the cold plate and condenses [mark for a)ii) cannot be awarded].

Do not give credit in **either** a)i) **or** a)ii) for a response that includes incorrect science where steam is referred to as a liquid:

- the steam evaporates [mark for a)i) cannot be awarded];
- the gas cools and changes into steam on the bottom of the plate [mark for a)ii) cannot be awarded].

Do not give credit for an insufficient response:

- hot air condenses on the plate [there is likely to be water vapour in the air, but this needs to be explicit].

(b) Award **ONE** mark for labelling the horizontal axis with time **and** giving minutes as the unit of measurement: 1(L5)

- time (in) mins.

ONE mark may be awarded for:

- minutes;
- how long it takes in minutes.

Do not give credit for a response that includes incorrect science giving the units of time as anything other than minutes:

- time (seconds);
- hours;
- seconds;
- time (m) ['m' is the unit of measurement for metres].

Do not give credit for an insufficient response:

- time [does not give units];
- how long [does not give units and could refer to length].

(c) Award **ONE** mark for an explanation that salt increases the rate of melting: 1(L5)

- salt makes ice melt quicker;
- ice melts more quickly when salt is added.

ONE mark may be awarded for:

- the water comes through the funnel faster when he adds salt;
- salt melts the ice better;
- ice melts easier with salt.

Do not give credit for an insufficient response:

- water melts quicker with salt;
- the salt melts the ice quickly [the ice melts without salt as well];
- ice melts without salt;
- salt affects the rate at which ice melts; [these responses do not describe the effect of adding salt].

(d) Award **ONE** mark for: 1(L5)

He did not try different amounts of salt.

<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>

[5]

7. (a) Award **ONE** mark for: 1

- 50

(b) Award **ONE** mark for an understanding that the mass has decreased: 1

- it went down;
- it is less;
- it gets lighter.

Allow: a numerical response that implicitly indicates a decrease in mass:

- it has changed from 50g to 30g;
- it has gone down by 20g (± 2).

Do not give credit for a numerical response that implies an upward trend:

- it went up by 20g;
- it changed from 30g to 50g.

Do not give credit for an insufficient response:

- it is a straight line;
- it is sloping down; [these describe the line, not the mass of the sponge];
- it has changed;
- it changed by 20g; [do not indicate direction of change].

- (c) Award **ONE** mark for an indication of evaporation: 1
- evaporation;
 - evaporating.

Allow:

- the liquid becoming a gas.

Do not give credit for an insufficient response that indicates the presence of liquid water in the pan of the scales:

- the water leaking out;
- dripping.

Do not give credit for an insufficient response:

- drying [given in stem].

- (d) Award **ONE** mark for: 1
- 30g

- (e) Award **ONE** mark for all three answers correct: 1
- Bob : true
Ruth : false
Komal : true

8. (a) Award **ONE** mark for a response that indicates the temperature gets colder: 1 (L3)
- the water/it gets colder
 - the temperature goes down.

ONE mark may be awarded for a response stating that the temperature of the freezer is colder but not referring to the temperature of the water:

- it is colder in the freezer.

ONE mark may be awarded for a response that implies a change of temperature:

- it will get cold
- the temperature will go to (below) 0°C.

Do not give credit for a response that includes incorrect science suggesting that the water gets warmer:

- it gets warmer in the freezer.

Do not give credit for an insufficient response that is an absolute statement that the water/temperature is cold:

- the temperature is cold.

Do not give credit for an insufficient response stating that the water freezes:

- it freezes
- it turns to ice.

Do not give credit for an insufficient response stating that the temperature changes:

- the temperature is not the same.

- (b) Award **ONE** mark for: 1 (L4)
- thermometer
 - temperature sensor.

ONE mark may be awarded for:

- *heat sensor.*

Do not give credit for an insufficient response:

- *sensor.*

- (c) Award **ONE** mark for **all three** statements correctly classified: 1 (L4)
- Water freezes at 100°C. ...False...*
- Freezing water is a reversible change. ...True...*
- Freezing is a change from solid to liquid. ...False...*

- (d) Award **ONE** mark for: 1 (L4)
- melting
 - melt.

Do not give credit for a response that includes incorrect science:

- *dissolve.*

[4]

9. (a) Award **ONE** mark for: 1(L4)
- | | | |
|-------------------|-------------------------------------|--------------------------|
| a pulling force | <input type="checkbox"/> | <input type="checkbox"/> |
| towards the Earth | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

- (b) Award **ONE** mark for an indication that Newton needed evidence to support his ideas or so that he could be more certain of his ideas: 1(L5)
- to gather evidence to support (or reject) his ideas;
 - to see if his ideas were supported by his results/investigations;
 - to see if his predictions were correct;
 - to find out if other things fall from the same force;
 - if he said anything without investigating it, other people may find something different.

ONE mark may be awarded for a response that implies he would know if his ideas were true:

- *to see whether his ideas were right/ wrong;*
- *to see if it/his idea works/is true;*
- *to check his ideas;*
- *to know (for sure) which force causes the apple to fall;*
- *if he just guessed he may be wrong;*
- *so he could know why the apple fell on his head;*
- *if he did not test, he would not know what happened.*

Do not give credit for an insufficient response:

- *to test his ideas [given];*
- *to make sure;*
- *to see if his results are true;*
- *to check his results;*
[these responses imply an investigation has already been carried out];
- *to see if he had the right/correct answer [implies results for his ideas have been determined previously];*
- *to make it a fair test;*
- *to make it accurate;*
- *to see if the investigation worked.*

(c) Award **ONE** mark for recognising that gravitational force is responsible for keeping the Earth in orbit: 1(L4)

- gravity.

ONE mark may be awarded for:

- *weight.*

Do not give credit for an insufficient response describing gravitational force:

- *a pulling force towards the Earth.*

(d) Award **ONE** mark for a response giving a time period equivalent to a year: 1(L4)

- 1 year;
- 52 weeks;
- 365-366 days [inclusive].

Do not give credit for an insufficient response that gives no units or uses inappropriate units:

- 365;
- 52 days.

(e) Award **ONE** mark for a response that clearly describes the Earth spinning on its axis to cause day and night: 1(L5)

- it rotates;
- it spins (on its axis);
- it turns on its axis.

ONE mark may be awarded for:

- *it revolves;*
- *(it moves) on its axis.*

Do not give credit for an insufficient response implying night and day are caused by the Earth orbiting the Sun:

- *it turns around the Sun;*
- *it orbits.*

Do not give credit for an insufficient response:

- it turns;
- it goes (a)round;
- during the day, the Earth is facing the Sun, at night the Earth is facing away from the Sun/facing the Moon.

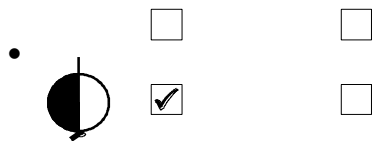
[5]

10. (a) Award **ONE** mark for a response giving a time period equivalent to a year: 1

- response between 365 and 366 days inclusive;
- 12 months;
- 52 weeks;
- 1 year.

Do not give credit for a response without units.

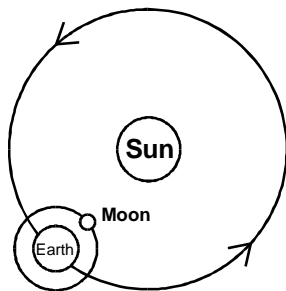
(b) Award **ONE** mark for: 1



(c) Award **ONE** mark for: 1

- spin the ball on the string
-

(d) Award **ONE** mark for an indication of the Moon orbiting the Earth: 1



Allow: a response with arrows on the path of orbit in either direction.

11. (a) Award **ONE** mark for identifying the number of materials tested: 1(L3)

- 3.

Do not give credit for an insufficient response that names the three materials:

- cotton, nylon, wire.

(b) Award **ONE** mark for identifying the dependent variable (DV): 1(L4)

- whether or not the sound could be heard (through the cups)
- whether the sound travels through different materials
- the volume of the sound
- how much sound could be heard

- if she could hear them.

ONE mark may be awarded for:

- *sound*
- *I can hear you*
- *hearing (sound).*

Do not give credit for a response that includes incorrect science implying another factor has been measured:

- *plastic cups*
- *materials.*

Do not give credit for an insufficient response that identifies a question for an alternative investigation:

- *which material does the sound travel through?*
- *how long does it take to hear the sound?*

- (c) Award **TWO** marks for identifying **any two** of the independent variables (IV) in the investigation: 2(L4)

- the length (of cotton, nylon and wire)
- the type of material/string/line.

or: If you are unable to award two marks, award **ONE** mark for identifying **any one** IV in the investigation.

Marks may be awarded for:

- *materials/fabric*
- *amount of material.*

Do not give credit for an insufficient response:

- *the sound*
- *the line [could refer to length or tightness]*
- *the cups*
- *tightness/looseness/straightness [given]*
- *thickness.*

Do not give credit for an insufficient response that identifies a factor Jill may have changed but did not record in her notes:

- *volume*
- *amount of sound.*

Do not give credit for a second response that is a restatement or repetition of the first.

- (d) Award **ONE** mark for recognising the importance of varying only the IV: 1(L4)

- so you would know which factor had an effect
- because she would not know what had an effect
- if you change everything it will not be a fair test
- to make the test fair
- so you can compare the results.

ONE mark may be awarded for:

- *so you know which one is best*
- *the other things might influence the results*
- *so you can see which one works*
- *so you can make sure your conclusion is true.*

Do not give credit for an insufficient response:

- *so you do not get confused/mixed up*
- *so it does not get too complicated*
- *so it is not a fair test.*

Do not give credit for an insufficient response that refers to the accuracy of the results:

- *to get the correct results*
- *so you can have the right result*
- *in case you make a mistake*
- *you might go wrong*
- *so you can be accurate.*

(e) Award **ONE** mark for a response recognising that the results are not referred to or interpreted: 1(L5)

- she has not talked about what she has found out/what happened/her results
- it does not explain what was compared
- it does not mention the results.

ONE mark may be awarded for a response which implies there is not enough information or recognises that 'best' is not defined:

- *it does not tell us why (it is best)*
- *there is not enough detail*
- *no information*
- *she needs more information*
- *there is no evidence.*

ONE mark may be awarded for a response indicating that the conclusion does not describe or interpret all the results of the investigation:

- *it does not tell you about wire or nylon*
- *she can hear through two of them*
- *wire worked too.*

Do not give credit for an insufficient response stating a conclusion:

- *cotton was the best material for sound to travel through.*

Do not give credit for an insufficient response:

- *there are no scientific words in it*
- *it was very short*
- *it is just an opinion.*

Do not give credit for an insufficient response indicating that the initial investigation was flawed:

- *she changed three things instead of one.*

Total Time : 60 minutes

Total possible score: 49

Approximate Level Guidance:

<14 <L3b

15 - 17 L3b

18 – 20 L3a

21 – 23 L4c

24 – 27 L4b

28 – 32 L4a

>32 Level 5+