Anglo-Chinese School (Junior)

PRELIMINARY EXAMINATION (2024)

PRIMARY 6
SCIENCE
(BOOKLET A)

20 August 2024

Total Time for Booklets A and Booklet B : 1 hour 45 minutes

Name _____ ( ) Class: 6.( )

INSTRUCTIONS TO CANDIDATES

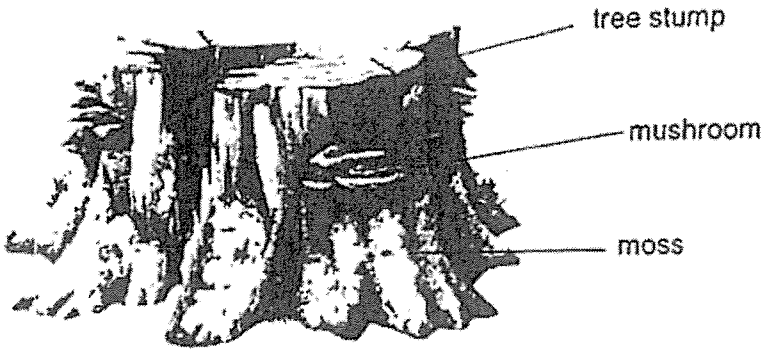
1. Write your Index No in the boxes at the top right hand corner.
2. Do not turn over this page until you are told to do so.
3. Follow all instructions carefully
4. Answer all questions
5. Use a 2B pencil to shade your answers on the Optical Answer Sheet (OAS).

This booklet consists of 17 printed pages.

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and shade your answer on the Optical Answer Sheet.

(56 marks)

1 Mushrooms and moss can be found on old tree stumps on the forest floor.



Which of the following is true about mushrooms and moss?

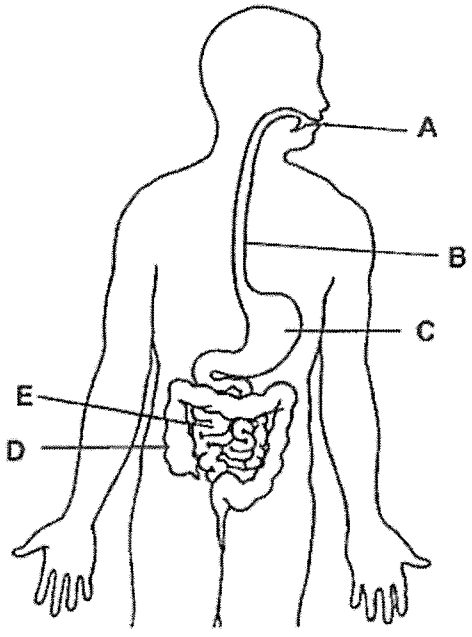
(1) Both need light to grow.

(2) Both reproduce by spores.

(3) Both obtain food from the tree stump.

(4) Both need to be sheltered by the tree stump.

2 Study the diagram.



Which of the following shows how food travels through the digestive system before digested food enters the blood?

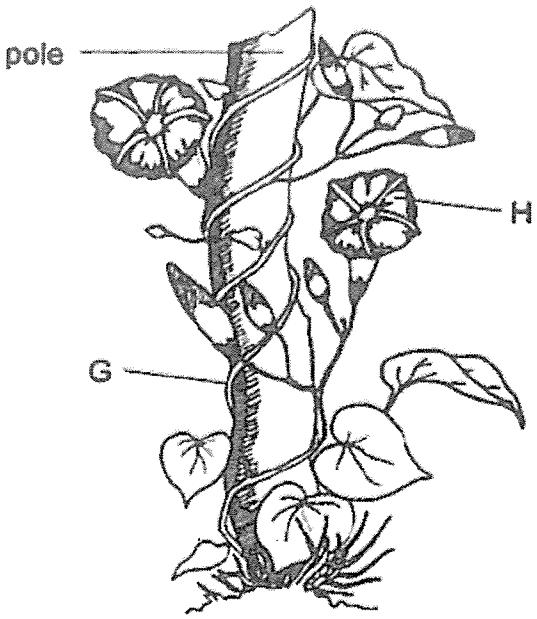
(1) A → B → C → D

(2) A → B → C → E

(3) B → C → D → E

(4) B → C → E → D

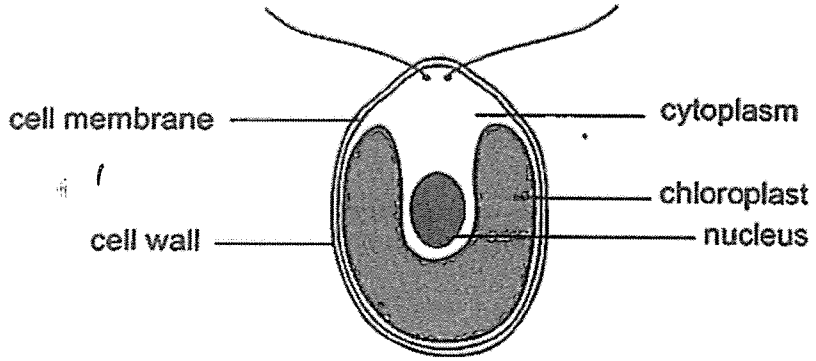
3 The diagram shows a morning glory plant.



What are the functions of parts G and H?

	G	H
(1)	To absorb water	To attract insects
(2)	To anchor the plant to the ground	To make food
(3)	To transport water around the plant	To absorb water
(4)	To allow the leaves of the plant to reach for more sunlight	To reproduce

4 The diagram shows an organism.



Which statement is correct?

(1) The cytoplasm controls activities in the cell.

(2) The cell membrane gives the cell its shape.

(3) This organism makes its own food.

(4) This organism is an animal.

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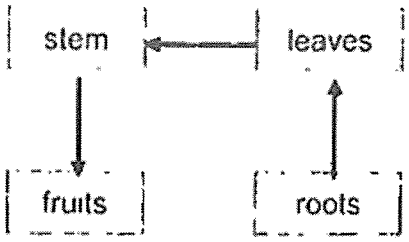
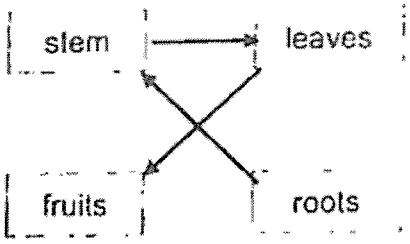
5 Which of the following shows how water is transported in a plant?

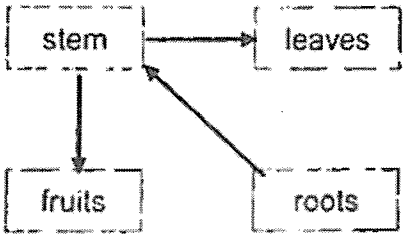
(1)



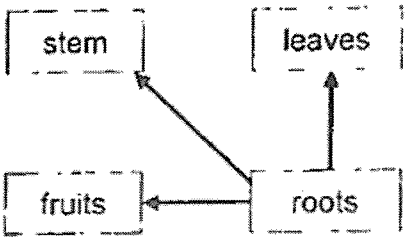
(2)



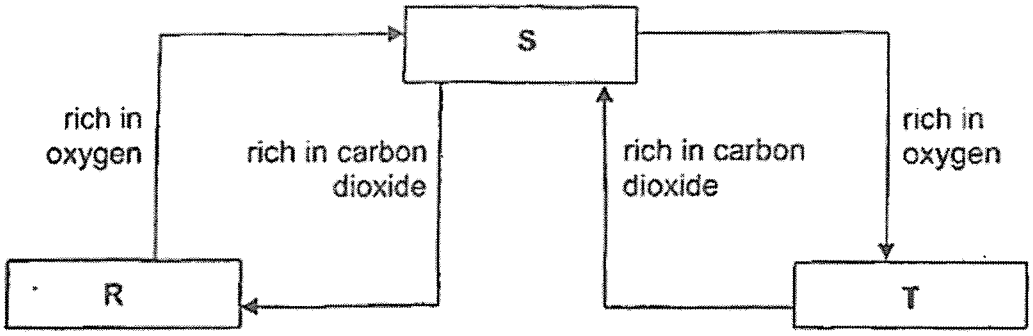
(3)



(4)



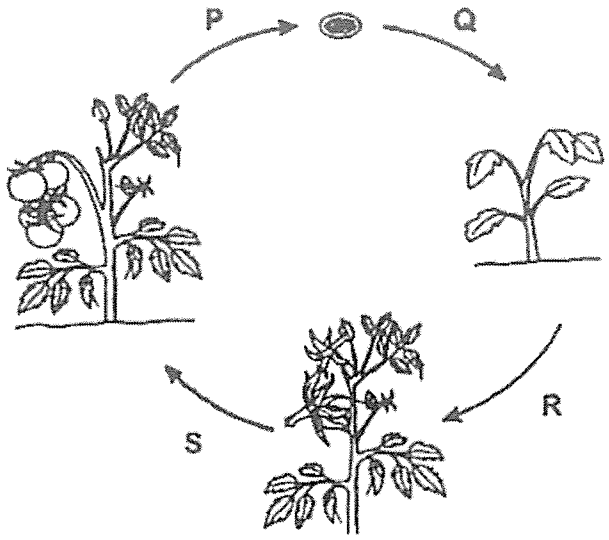
6 The diagram shows the direction of blood flow in some parts of the human body.



What do R, S and T represent?

	R	S	T
(1)	lungs	other parts of the body	heart
(2)	lungs	heart	other parts of the body
(3)	heart	lungs	other parts of the body
(4)	heart	other parts of the body	lungs

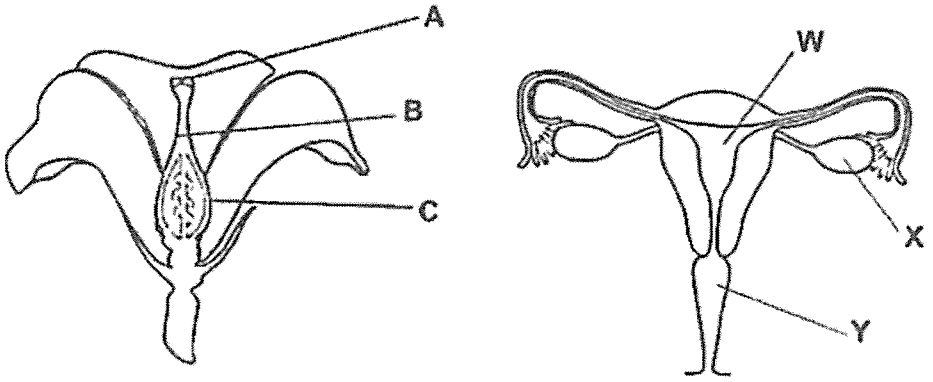
7 P, Q, R and S represent processes in the life cycle of Plant X.



Which of the following is correct?

	Dispersal	Germination	Fertilisation
(1)	P	Q	S
(2)	Q	R	S
(3)	S	P	R
(4)	P	Q	R

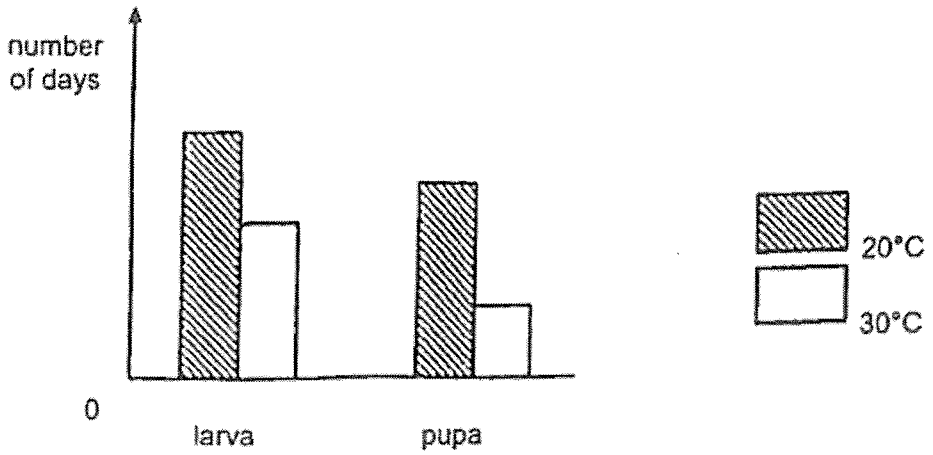
8 The diagrams show the female reproduction parts of a plant and a human.



Which two parts have a similar function?

(1) A and W
(2) A and Y
(3) B and X
(4) C and Y

9 The graph shows the duration of two stages in the life cycle of a butterfly when surrounding temperature increased from 20°C to 30°C due to global warming.



Based on the graph, which conclusion is correct when the surrounding temperature increased?

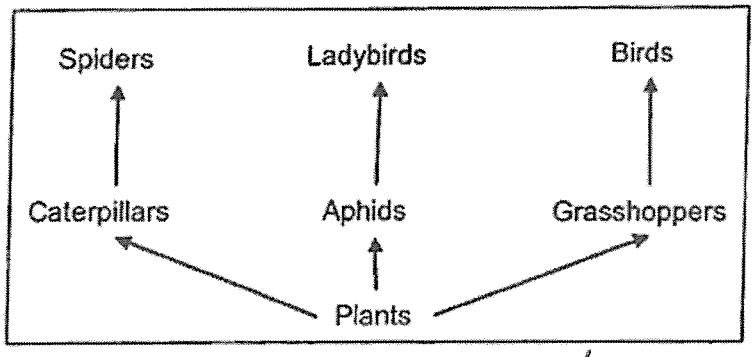
(1) Only the duration of the larva stage was affected.

(2) The duration of the life cycle of butterfly was not affected.

(3) The duration of the larva and pupa stages became shorter.

(4) The duration of the pupa stage became shorter than the larva stage.

10 Study the following food web in a field.



The use of insecticides in the field caused a drastic decrease in the populations of aphids and caterpillars.

Which of the following correctly shows the effect of the use of insecticides on the population of grasshoppers and ladybirds?

	Population of grasshoppers	Population of ladybirds
(1)	Increases	Remains the same
(2)	Decreases	Remains the same
(3)	Decreases	Increases
(4)	Increases	Decreases

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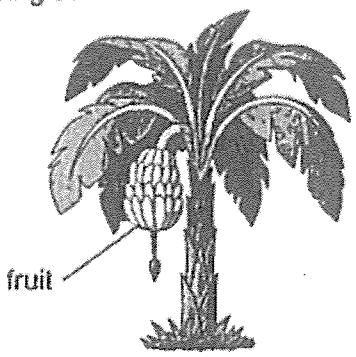
11 A farmer found out that the fruit of plant B, as shown in the diagram, is much sweeter during warm weather than cold weather. During warm weather, the sun shines more than during cold weather.



Which statement best explains why plant B produces sweeter fruit during warm weather?

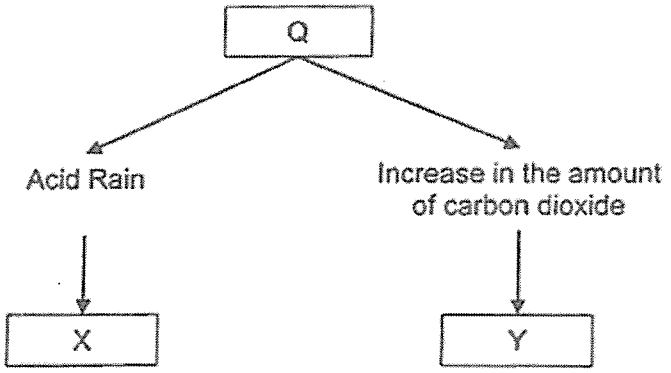
(1) It loses more water.

(2) It can take in more carbon dioxide.

(3) It can trap more sunlight for photosynthesis.

(4) Its food-carrying and water-carrying tubes expand.

12 Q represents man's activity and X and Y represent its effects on the environment.



Which of the following correctly represents Q, X and Y?

	Q	X	Y
(1)	Air pollution	Damage to buildings	Global warming
(2)	Deforestation	Soil erosion	Global warming
(3)	Air pollution	Melting of ice caps	Soil erosion
(4)	Land pollution	Damage to buildings	Melting of ice caps

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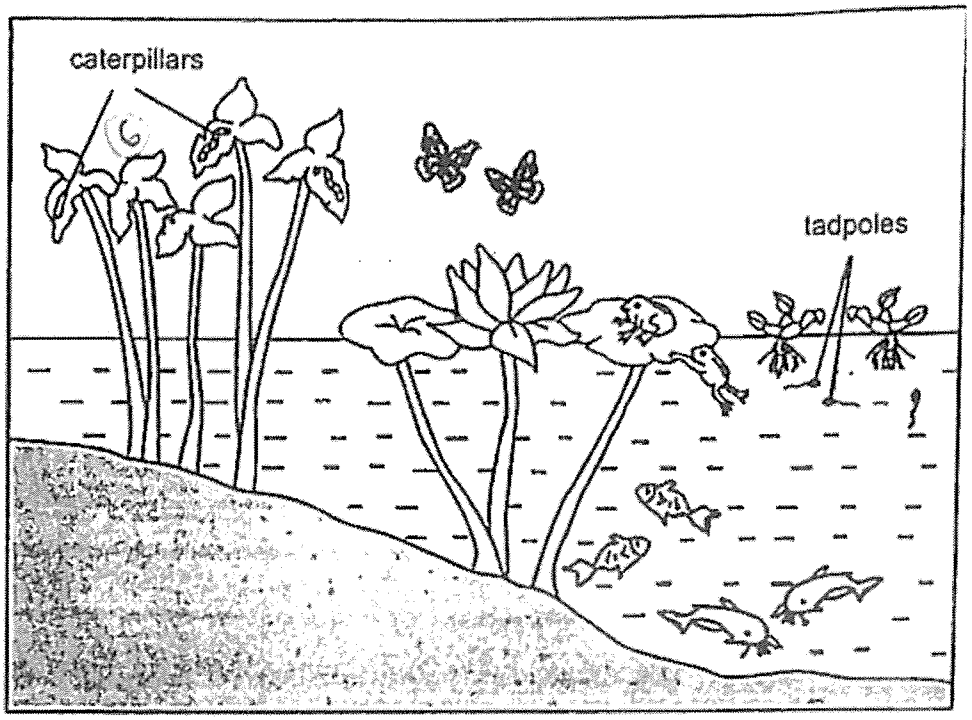
13 The diagram shows a pond habitat.



Which of the following statements is correct?

(1) There are 4 populations of producers.

(2) There are 4 populations of consumers.

(3) There are 8 populations of consumers.

(4) There are 9 populations of living organisms.

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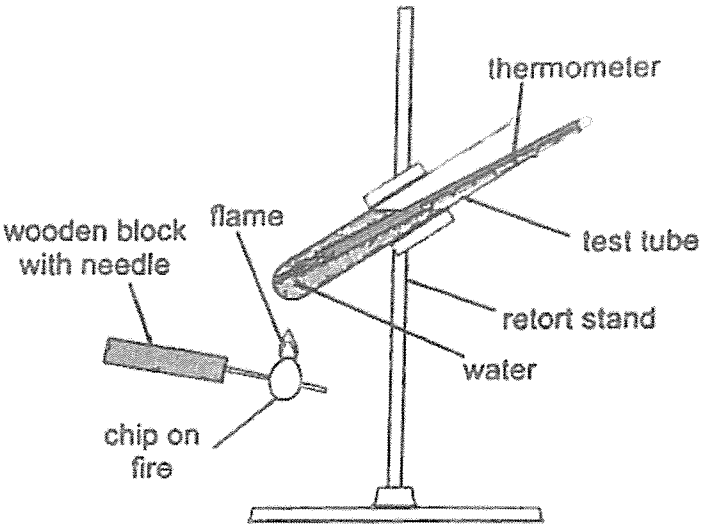
14 Ahmad conducted an experiment to find out how much stored energy different types of chips had. He set each identical chip on fire and used it to heat 30 ml of water as shown until each chip was completely burnt.



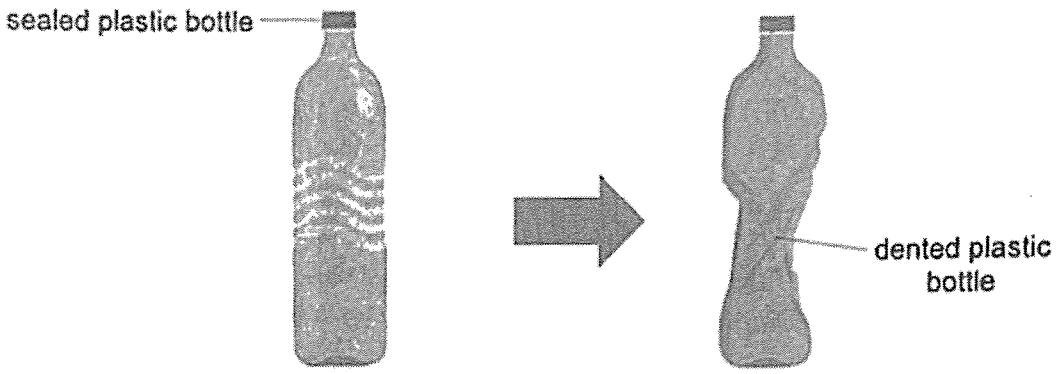
The table shows the change in temperature of water in the test tube when each type of chip was burnt.

Type of chip	Temperature of water (°C)	
	At the start	At the end
Corn	20	41
Potato	20	47
Tortilla	20	30
Whole grain	20	33

Based on the results, which type of chip has the most stored energy?

(1) Corn
(2) Potato
(3) Tortilla
(4) Whole grain

15 Liam crushed a sealed empty plastic bottle with his hands until it was dented.



Which statement is correct?

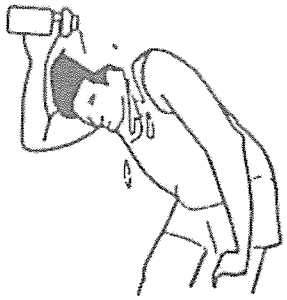
(1) Air in the bottle was compressed.
(2) The mass of the bottle decreased.
(3) The volume of air in the bottle increased.
(4) The mass of the air in the bottle decreased.

16 Which of the following is **not** a source of light?

(1) Star
(2) Mirror
(3) Firefly
(4) Lightning

(Go on to the next page)

17 A runner pours tap water on his body after his run



Which of the following explains how this cools the runner?

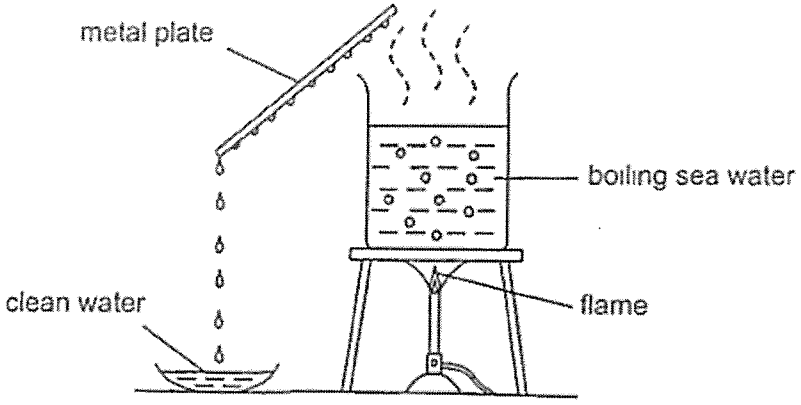
(1) The water loses heat to his body

(2) The water gains heat from his body

(3) His body loses heat to the surroundings

(4) The water loses heat to the surroundings

18 Mei Ling used the set-up to collect clean water from sea water



What can Mei Ling do so that she can collect more clean water in a shorter period of time?

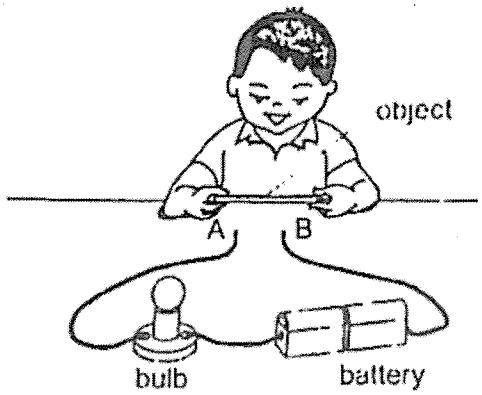
(1) Add more boiling sea water.

(2) Decrease the intensity of the flame.

(3) Increase the size of the metal plate.

(4) Use a warm glass plate instead of the metal plate.

19 Mohammad placed an object touching parts A and B as shown and the bulb did not light up

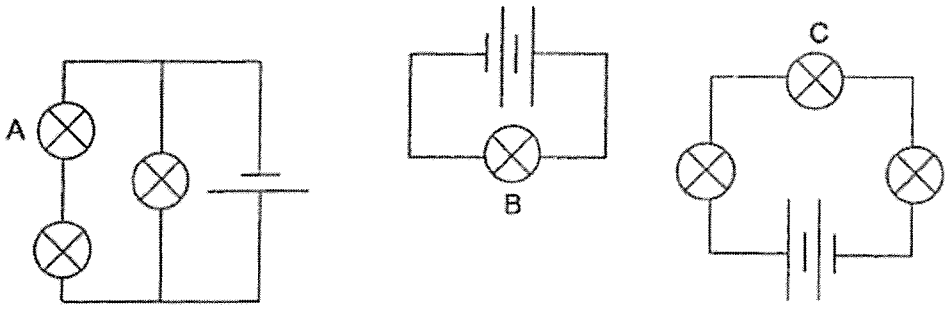


What can the object be?

A magnet
B glass rod
C copper wire
D aluminium foil

(1) B only
(2) A and B only
(3) C and D only
(4) A, C and D only

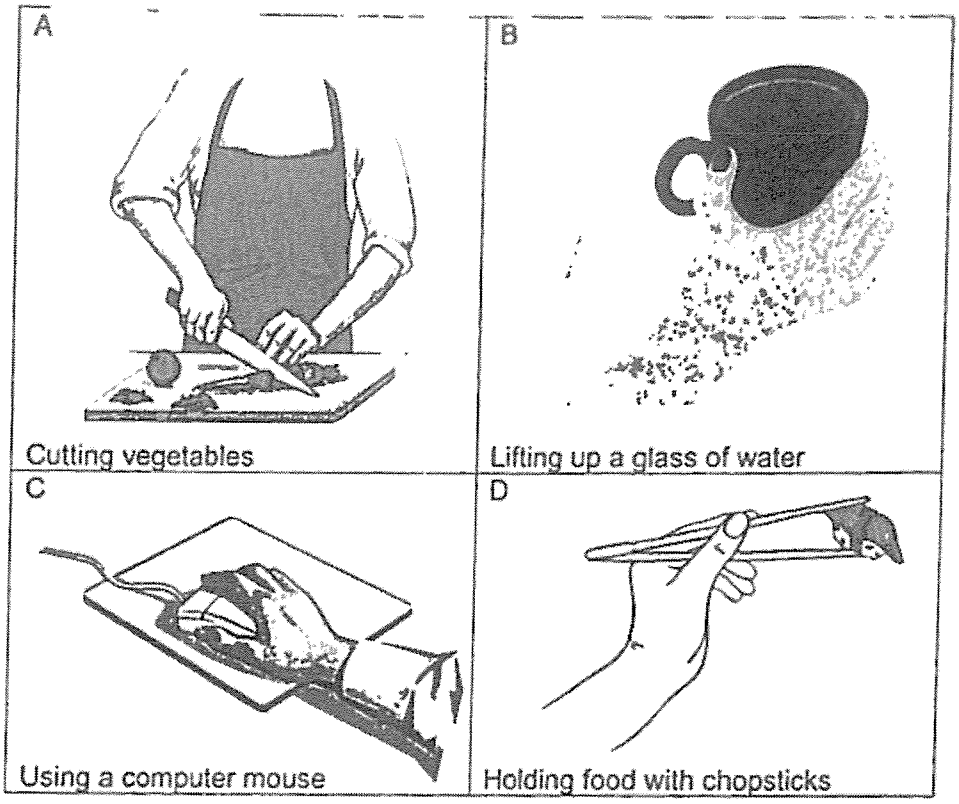
20 The following circuits are set up using identical batteries and bulbs, which are in working condition



Which of the following about the brightness of bulbs A, B and C is correct?

(1) Bulb C is the dimmest.
(2) Bulb B is the brightest.
(3) Bulb A is as bright as B.
(4) Bulb A is brighter than C.

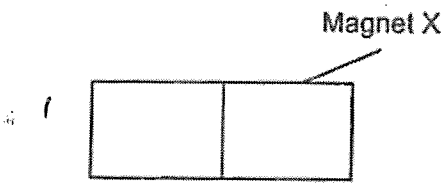
21 The diagrams show some daily activities involving the use of forces.



Which of the following activity/activities involve(s) a **pull** only?

(1) B only
(2) C only
(3) A and D only
(4) B and C only

22 Magnet X did not have its poles labelled.

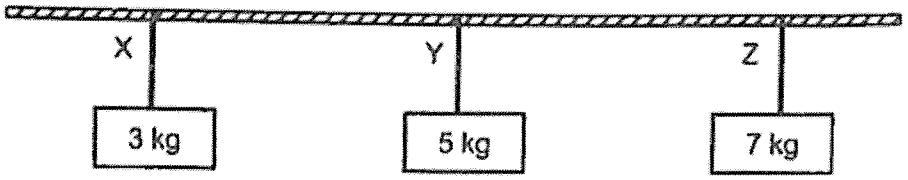


Which of the following is **not** a way to find the poles of Magnet X?

(1) Place Magnet X beside a compass.
(2) Place a magnetic object and Magnet X together.
(3) Test for repulsion using a magnet with its poles labelled.
(4) Hang Magnet X from a string and allow it to come to rest.

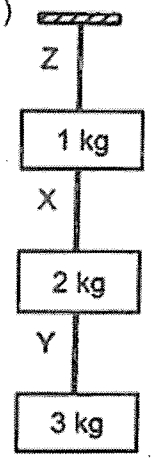
(Go on to the next page)

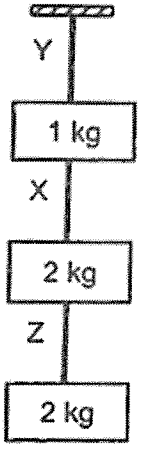
23 Anton tested three types of string, X, Y and Z, by hanging weights from each string. He increased the weights until each string broke. The maximum weight that each string could hold before breaking is as shown.

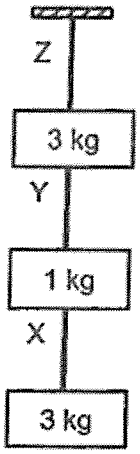


Anton then tried a few arrangements of hanging different weights.

Which of the following arrangements would be possible?

(1)


(2)


(3)


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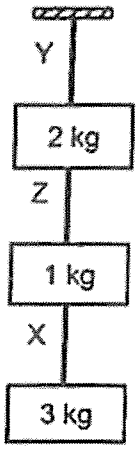
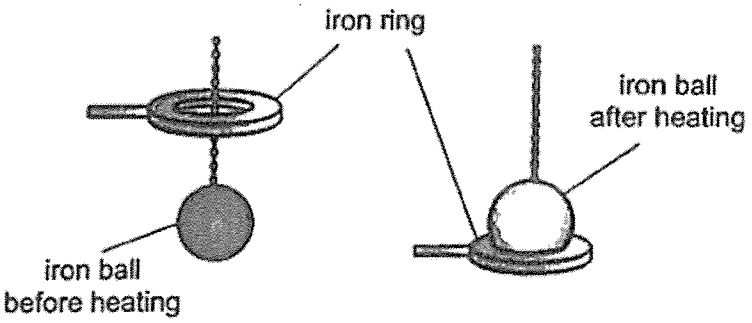


24 Samy carried out an experiment using an iron ball and an iron ring. The ball at room temperature could pass through the ring. However, the iron ball could not pass through the ring after it was heated over a flame.



What had happened to the volume and mass of the iron ball after it was heated?

	Volume of the iron ball	Mass of the iron ball
(1)	Remains the same	Increases
(2)	Increases	Remains the same
(3)	Increases	Increases
(4)	Remains the same	Remains the same

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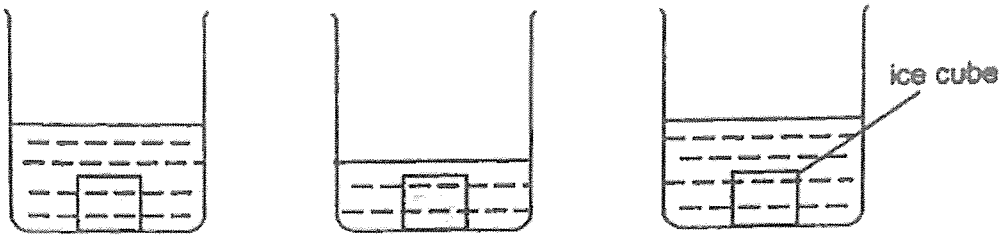
25 Seng Huat prepared the setups using identical beakers as shown. He then placed identical ice cubes into each beaker at the same time.



Beaker X
100 ml of water
80°C

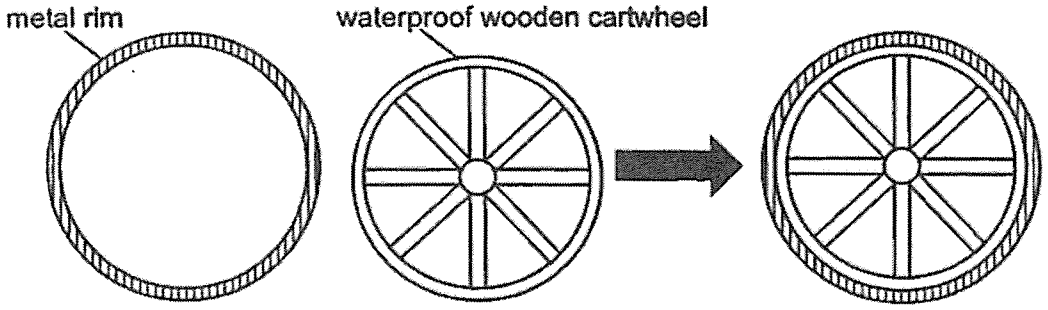
Beaker Y
50 ml of water
80°C

Beaker Z
100 ml of water
20°C

Arrange the beakers in order of the amount of time taken for the ice cube to melt completely, starting with the longest amount of time.

	Longest time → Shortest time		
(1)	X	Y	Z
(2)	X	Z	Y
(3)	Z	X	Y
(4)	Z	Y	X

26 Ansel wanted to fit a metal rim tightly round a waterproof wooden cartwheel.

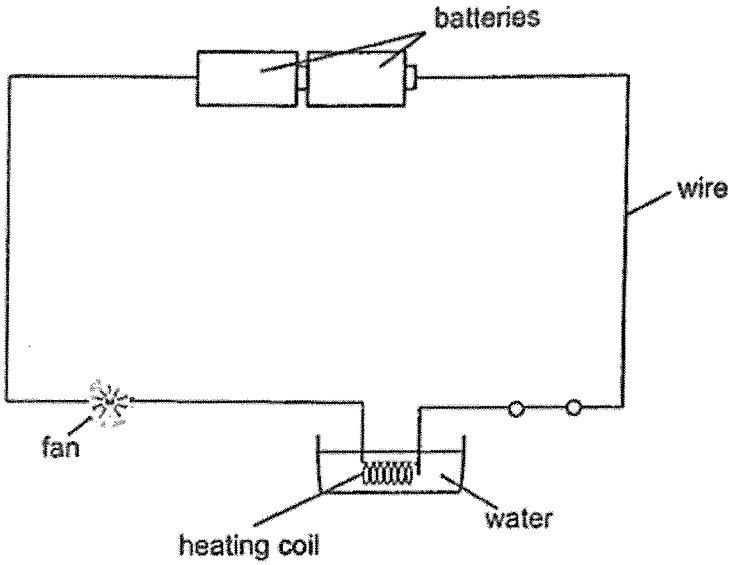


The metal rim was too small to fit around the waterproof wooden cartwheel.

Which of the following two steps would allow Ansel to fit the rim tightly around the cartwheel?

	Step 1 (before fitting the rim around the cartwheel)	Step 2 (after fitting the rim around the cartwheel)
(1)	Put the cartwheel in cold water	Put the rim and cartwheel in hot water
(2)	Heat the rim evenly over a fire	Put the rim and cartwheel in hot water
(3)	Put the cartwheel in hot water	Put the rim and cartwheel in cold water
(4)	Heat the rim evenly over a fire	Put the rim and cartwheel in cold water

27 A fan and a container of water are connected to some batteries using wires as shown.

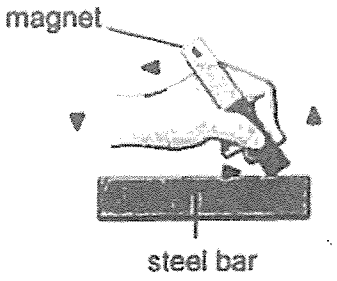


When the switch is closed, the fan starts moving and the temperature of the water in the container increases.

What type of energy is present at different parts of the circuit?

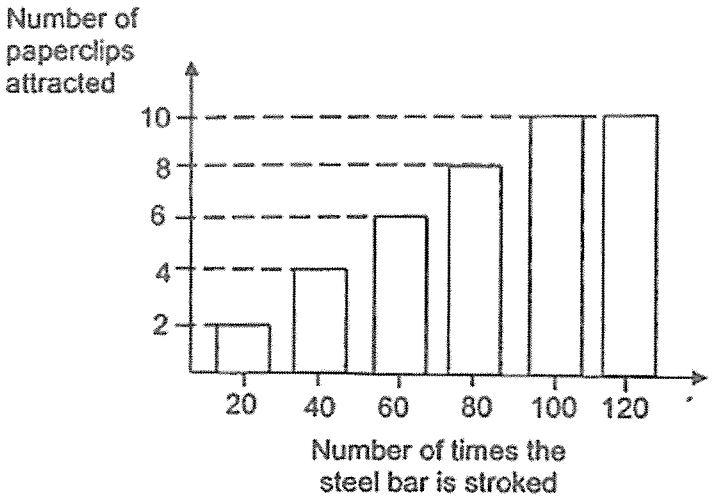
	Batteries	Wire	Water	Fan
(1)	Potential energy	Electrical energy	Light energy	Sound energy
(2)	Electrical energy	Potential Energy	Light energy	Kinetic energy
(3)	Potential energy	Electrical energy	Heat energy	Kinetic energy
(4)	Electrical energy	Potential energy	Heat energy	Sound energy

28 Elisha wanted to find out how the number of times the steel bar is stroked with a magnet affects the magnetism of the temporary magnet.



He stroked the steel bar with the magnet in the same direction 120 times. After every 20 strokes, he placed the temporary magnet near 15 paperclips to test how many paperclips it could attract.

He recorded his results in the graph as shown.



Based on the results of the experiment, what can Elisha conclude?

(1) The results of the experiment are inconclusive.

(2) The more times the temporary magnet was stroked, the stronger its magnetism.

(3) The magnetism of the temporary magnet remained the same after it was stroked 100 times.

(4) The magnetism of the temporary magnet increased the most when it was stroked from 40 to 80 times.

End of Booklet A

Anglo-Chinese School (Junior)

PRELIMINARY EXAMINATION (2024)

PRIMARY 6
SCIENCE
(BOOKLET B)

20 August 2024

Total Time for Booklets A and Booklet B : 1 hour 45 minutes

Name: _____ ( ) Class: 6.( )

Parent's Signature: _____

INSTRUCTIONS TO CANDIDATES

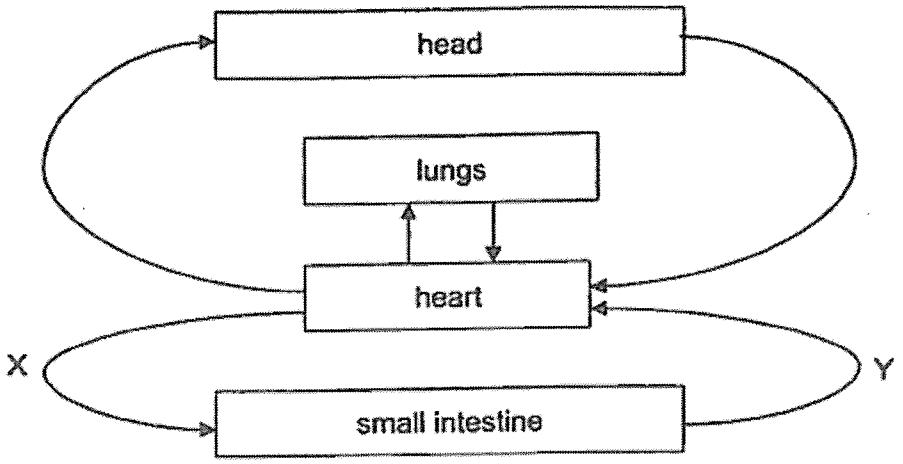
1 Do not turn over this page until you are told to do so.
2 Follow all instructions carefully.
3. Answer all questions.
4. Use a dark blue or black ballpoint pen to write your answers and use a pencil for drawings, diagrams or graphs
5. Do not use correction fluid/tape.
6. Do not use highlighter on any part of your answers.

Booklet	Possible Marks	Marks Obtained
A	56	
B	44	
Total	100	

This question paper consists of 17 printed pages.

For questions 29 to 40, write your answers in this booklet.
The number of marks available is shown in brackets [ ] at the end of each question or part question. (44 marks)

29 The diagram shows the blood flow in some parts of the human body.



(a) State the function of the blood vessels in the human circulatory system. [1]

_____

_____

(b) State two substances carried in the blood at Y that are more than at X. [1]

_____

Please do not write in the margin.

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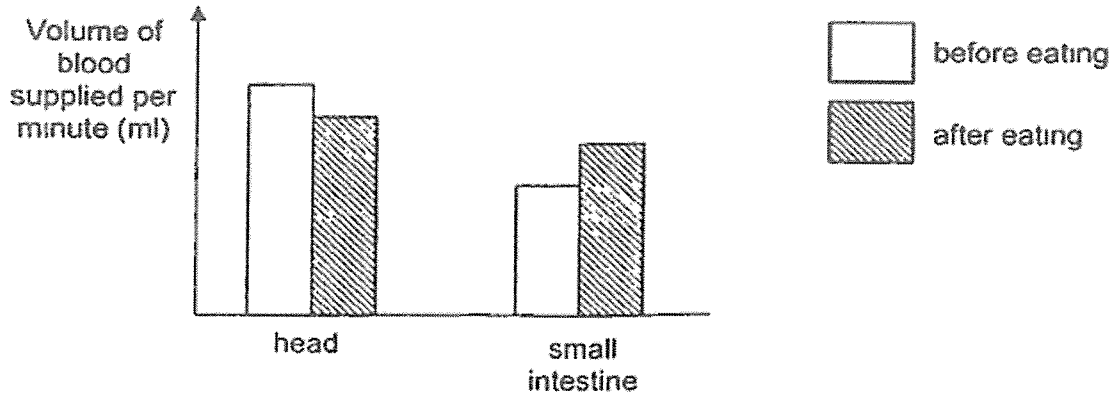
SCORE	/ 2

Mohan wanted to study how eating affects the volume of blood flow supplied to the head and small intestine per minute.

The graph shows the volume of blood supplied per minute to the head and small intestine before and after eating a meal.



(c) State what Mohan can conclude about the volume of blood flow supplied to the head and small intestine per minute after eating. [1]

_____

_____

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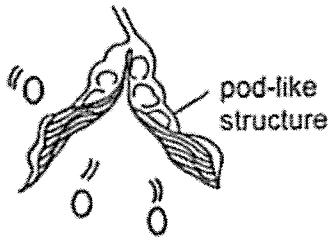
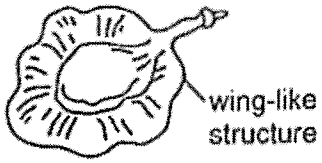
SCORE	1

30 The diagrams show fruits A and B



Fruit A



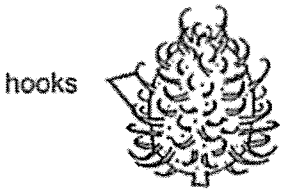
Fruit B

(a) State one advantage of the dispersal method of fruit A as compared to fruit B. [1]

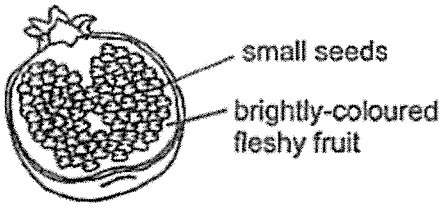
_____

_____

The diagrams show fruits C and D which are dispersed by animals.



Fruit C



Fruit D

(b) Describe how the seeds of fruits C and D are dispersed. [2]

Seed C: _____

_____

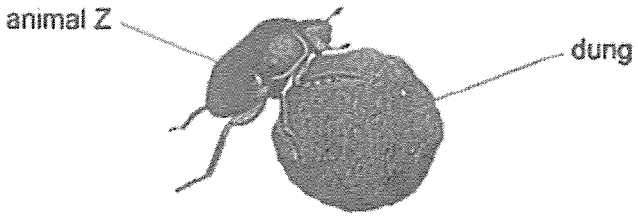
Seed D: _____

_____

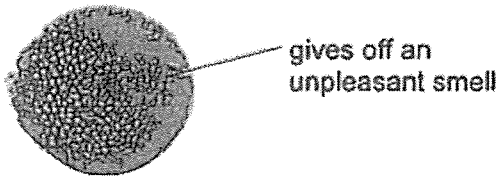
(Go on to the next page)

SCORE	/ 3

Animal Z feeds on dung, which is animal dropping, and is attracted by the unpleasant smell from the dung. It also rolls the dung to its nest and buries it deep underground for storage.



Scientists have found that plant E's fruit, as shown below, also gives off an unpleasant smell and is dispersed by animal Z.



Fruit of plant E

(c) Explain why the fruit of plant E is dispersed by animal Z. [1]

_____

_____

(Go on to the next page)

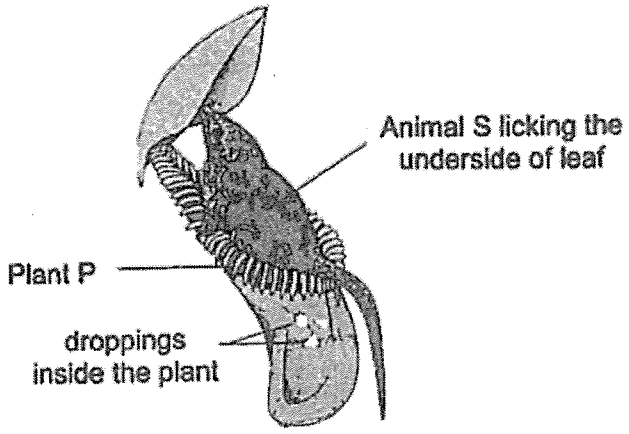
SCORE	/ 1

31 Animal S and Plant P live together in the same habitat where the soil is poor in mineral salts.

Plant P produces nectar on the underside of its leaf. It can also convert waste into mineral salts.

Animal S feeds on insects, and thus, its droppings are rich in mineral salts.

The diagram shows how Animal S and Plant P interact with each other.



(a) Based on the above information, explain how the organisms benefit from each other. [2]

Animal S: _____

_____

Plant P: _____

_____

(b) Aphids, which are insects commonly found in the habitat, can weaken Plant P by feeding on its sap. State how Animal S helps Plant P to continue to grow healthily. [1]

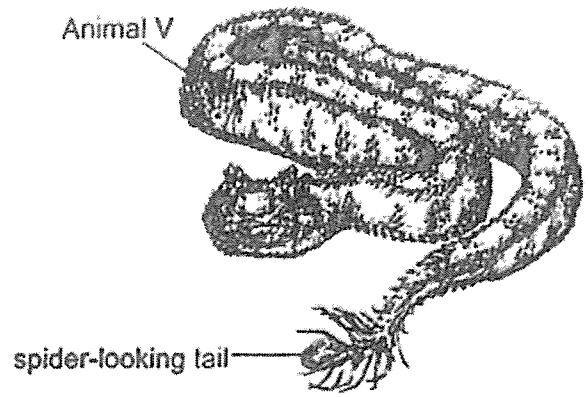
_____

_____

(Go on to the next page)

SCORE	/ 3

32 Animal V has grey scales on its body. It lives in a hot, dry desert with grey rocky areas. It has a tail that looks like a spider and it can also make it move like a spider does.



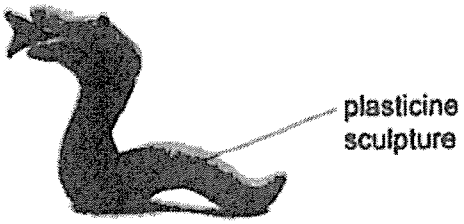
(a) Based on the information provided above, explain how Animal V uses its adaptations to catch its prey. [2]

(b) State a possible behavioural adaptation of Animal V that would allow it to stay cool in the hot and dry desert. [1]

(Go on to the next page)

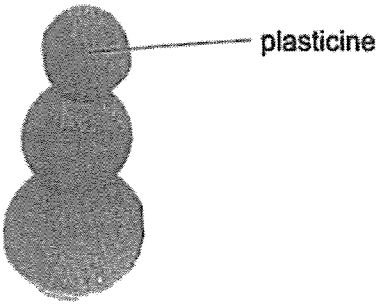
SCORE	
	3

33 Lucas made a plasticine sculpture as shown.



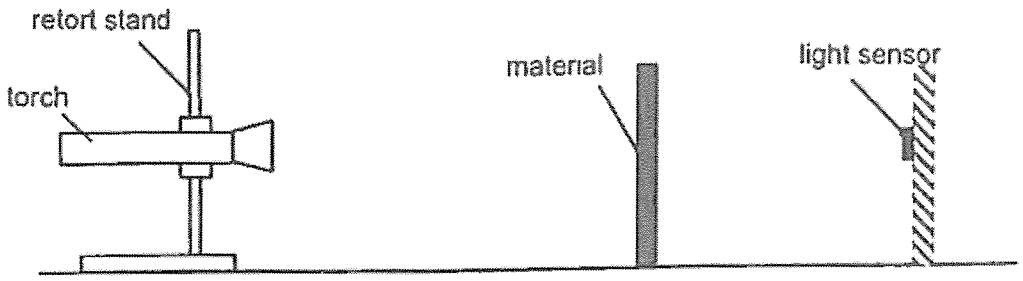
(a) Describe how Lucas can find the volume of the plasticine sculpture using a measuring cylinder and some water. [2]

(b) Lucas then kneaded the plasticine sculpture into three plasticine balls as shown.



Would the total volume of the three plasticine balls be greater than, less than, or the same as the volume of the plasticine sculpture? Explain your answer using the property of matter. [1]

34 Luke prepared the following experiment in a dark room He shone light from a torch on three different materials, X, Y and Z, and measured the amount of light detected by the light sensor as shown.

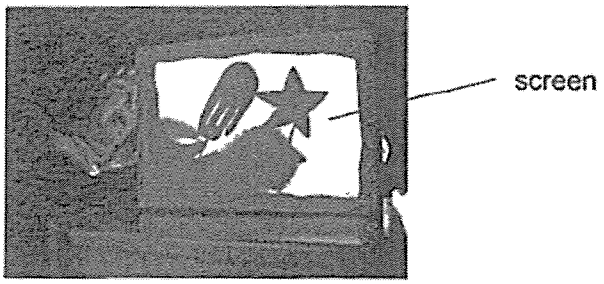


He also recorded the amount of light detected without any material. The results of his experiment are as shown.

Material	none	X	Y	Z
Amount of light detected (units)	100	90	0	35

(a) State the aim of Luke's experiment. [1]

(b) Luke would like to use one of the materials to make the screen for his shadow puppet show as shown. During the show, the puppets and the light source will be behind the screen.

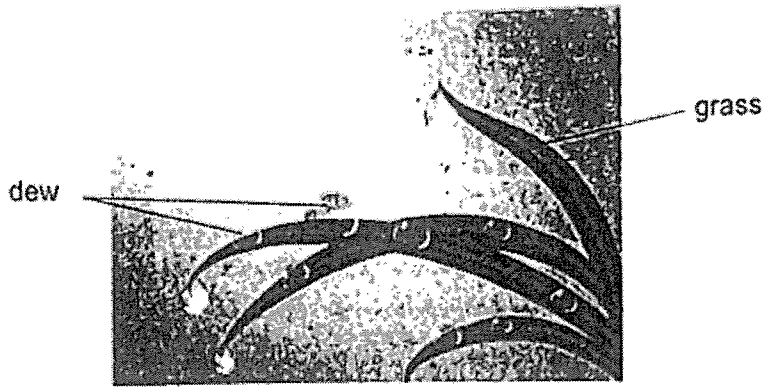


Which material, X, Y or Z, is the most suitable to make the screen for the shadow puppet show? Explain your answer. [2]

(Go on to the next page)

SCORE	/ 3

35 Leanne observed that small water droplets, known as dew, formed on the surfaces of the grass in her garden. This formation happens in the cool early mornings before the sun rises, even though it may not have rained the night before.



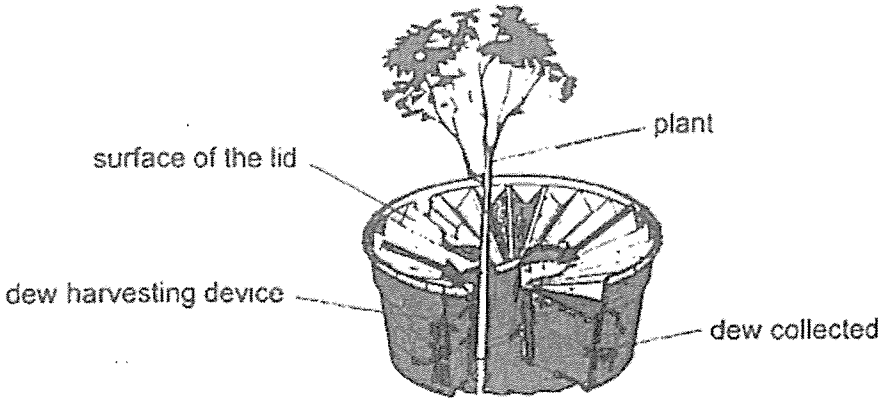
(a) Explain how dew is formed on the surfaces of the grass. [2]

(b) Leanne noticed that the dew disappeared from the surfaces of the grass after the sun has risen. Explain why the dew disappeared. [1]

(Go on to the next page)

SCORE	/ 3

In the desert, a dew harvesting device can be used to collect dew to water a plant so that the plant can survive better. Dew forms on the surface of the lid which flows down towards the centre of the device as shown



(c) Diagram 1 shows the dew harvesting device with a corrugated surface while diagram 2 shows the device with a flat surface.

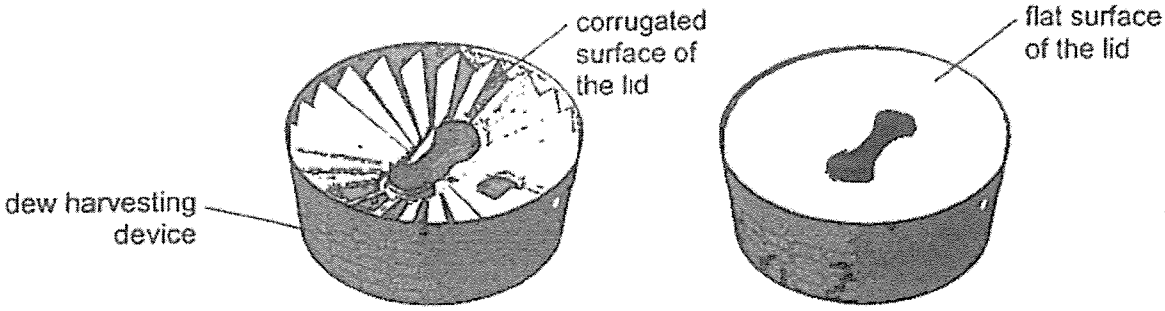


Diagram 1 Diagram 2

Explain how a corrugated surface would be better in collecting dew compared to a flat surface. [2]

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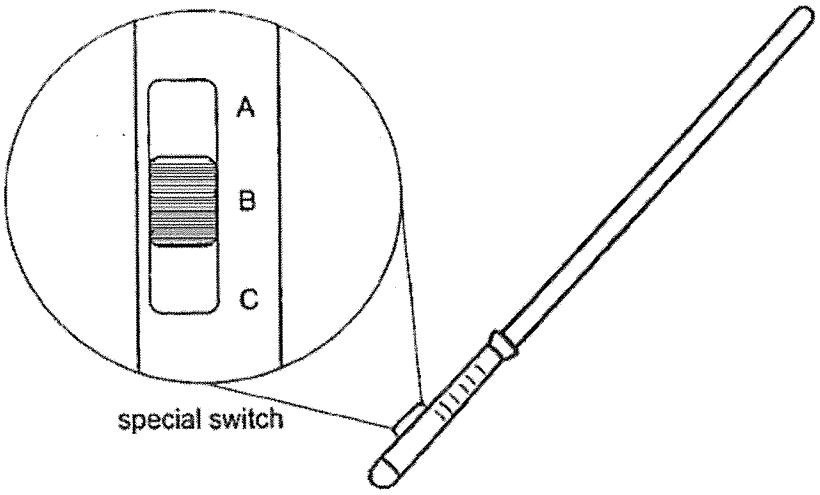
SCORE	/ 2

36 Alif had a light sabre toy that could also produce sound as shown.



The circuit in the toy had a special switch, with three positions A, B and C.

When the switch is at position A, the toy gives off light only.
At position B, the toy does not give off light or produce sound.
At position C, the toy gives off light and produces sound.

(a) When the bulb blew, the sound box did not produce any sound. State how the bulb and sound box were connected in the circuit. [1]

_____

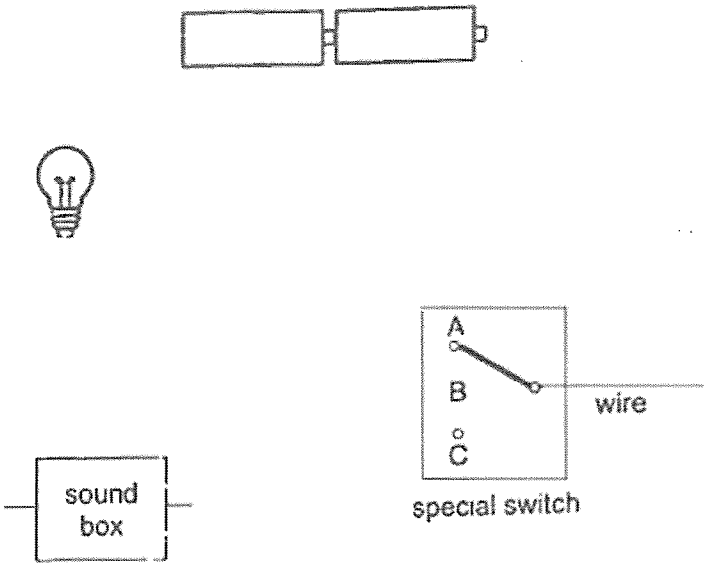
(b) Explain why the toy did not give off any light or sound when the switch was at position B. [1]

_____

(Go on to the next page)

SCORE / 2

(c) The diagram shows part of the circuit in the light sabre toy. Complete the circuit with wires only so that it will work as described. [2]



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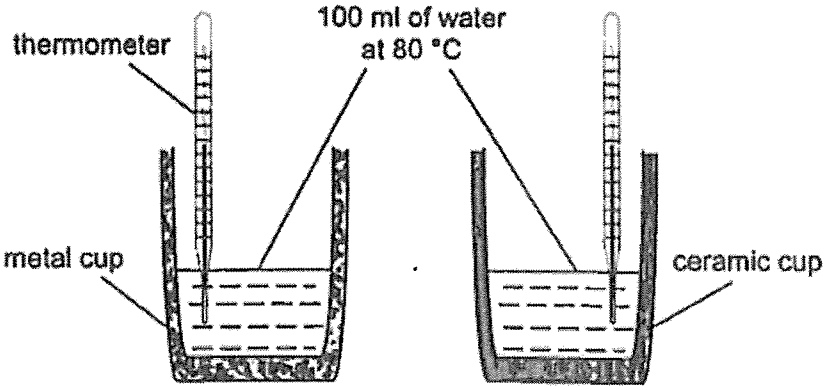
SCORE	2

37 (a) State what temperature is. [1]

Xiao Hua prepared two setups as shown. He measured the temperature of the water in each cup for 40 minutes and recorded it in the table.



	Temperature of water	
Time (min)	metal cup (°C)	ceramic cup (°C)
0	80	80
10	40	60
20	25	40
30	25	25
40	25	25

(b) Based on the results, how did the temperature of water in the metal cup change over the 40 minutes? [2]

(c) Explain why using the same volume of water at the same temperature ensures a fair test. [1]

(d) Which cup, metal or ceramic, would be able to keep ice cubes from melting for a longer period of time? Give a reason for your answer. [1]

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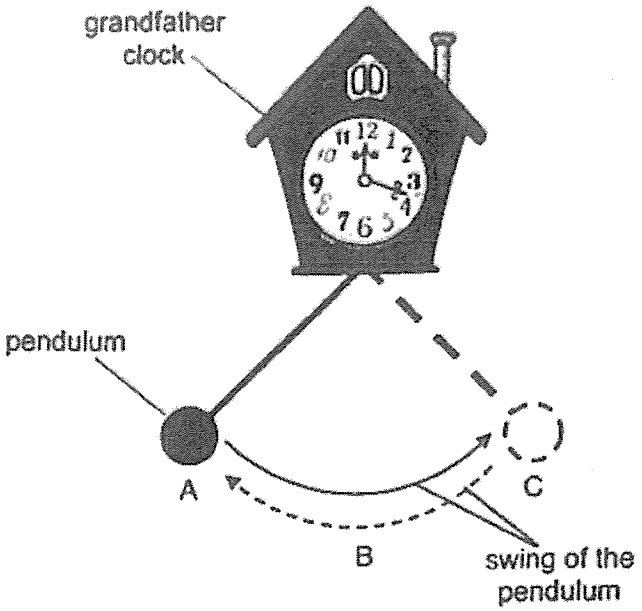
SCORE / 5

38 The diagram shows a grandfather clock. It has a pendulum that swings from A to C and from C to A continuously as long as the grandfather clock is working.



(a) Identify the energy possessed by the pendulum at points A and B. [1]

A: _____

B: _____

(b) The grandfather clock uses electricity to work. During a blackout, there is no electricity. The pendulum was observed to swing a few more times before finally coming to a stop.

(i) Give a reason why the pendulum continues to swing a few more times. [1]

_____

_____

(ii) Explain why the pendulum finally comes to a stop. [1]

_____

_____

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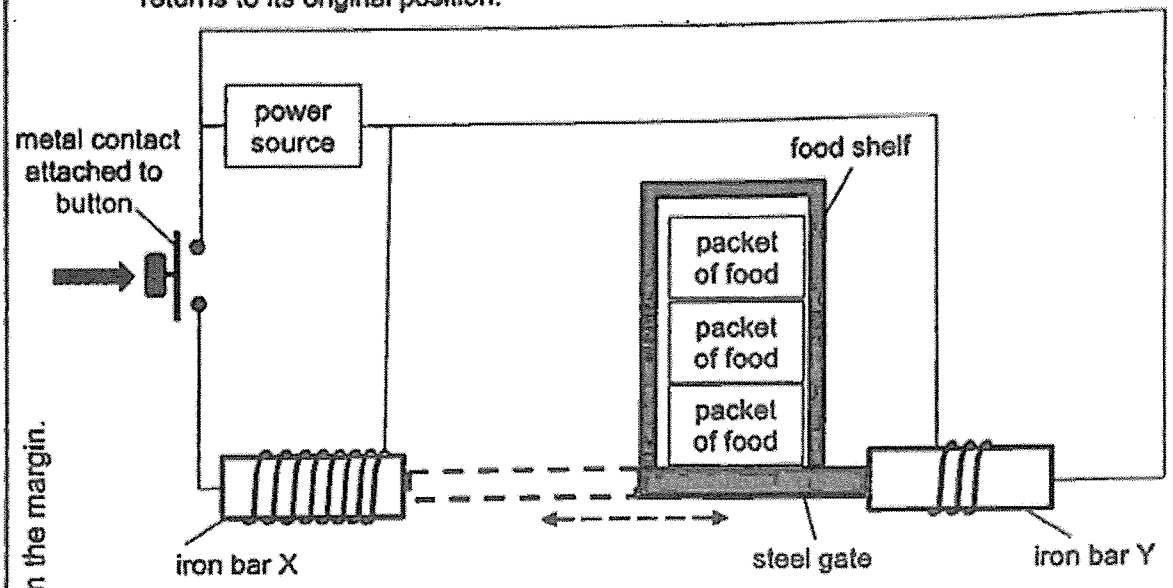
SCORE	
	3

39 The diagram represents a vending machine with identical iron bars X and Y. The steel gate can slide left and right. When the button is pressed and released, one packet of food will be dispensed from the bottom of the food shelf and the button returns to its original position.



(a) Explain which iron bar, X or Y, becomes a stronger electromagnet when the switch is closed. [2]

(b) Explain how the vending machine dispenses one packet of food at a time when the button is pressed and released. [2]

(c) Give a reason why the vending machine will not work if the steel gate were to be changed to a copper gate. [1]

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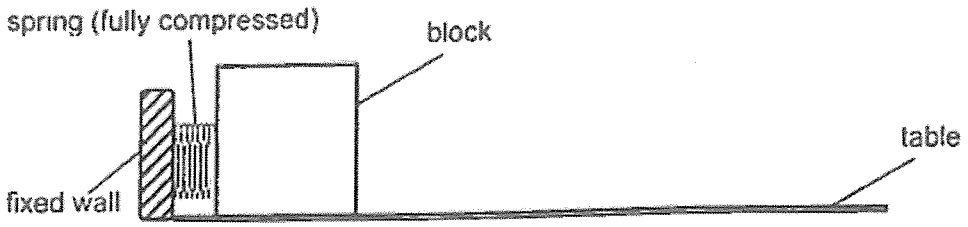
SCORE	/ 5

40 Matthew conducted an experiment using the set-up as shown



He measured the distance the block moved after releasing the spring. He repeated the experiment using blocks made of the same material, but with different mass and area of contact with the table.

(a) State a possible hypothesis between the mass of the blocks and the distance they moved for his experiment. [1]

Matthew recorded the results of his experiment in the table as shown.

Block	Mass (g)	Area of contact with the table (cm^2)	Distance moved (cm)
F	30	100	12
G	40	100	9
H	40	150	9

(b) Based on Matthew's experiment, did the area of contact with the table affect the distance moved by the block? Explain how you came to your conclusion. [1]

(c) Matthew repeated the same experiment using another block W. Block W is made of the same material as F, G and H. The mass of W is 30 g and its area of contact with the table is 150 cm^2.

State the distance moved by W. [1]

End of Paper

SCORE	/ 3

SCHOOL : ACSJ
LEVEL : PRIMARY 6
SUBJECT : SCIENCE
TERM : 2024 Prelims

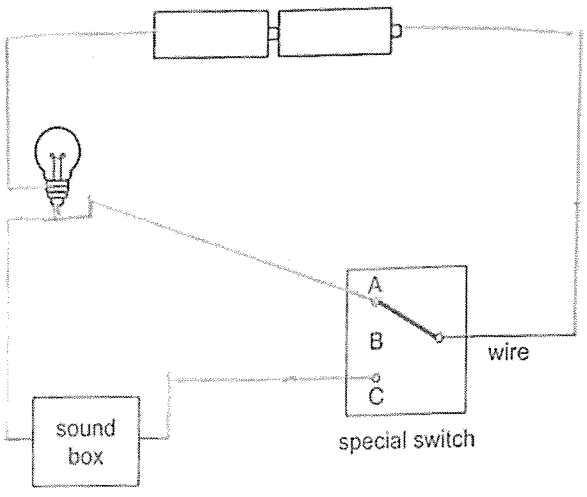
Booklet A

Q 1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
2	2	4	3	3	2	1	2	3	4
Q 11	**Q12**	**Q13**	**Q14**	**Q15**	**Q16**	**Q17**	**Q18**	**Q19**	**Q20**
3	1	2	2	1	2	2	3	1	2
Q 21	**Q22**	**Q23**	**Q24**	**Q25**	**Q26**	**Q27**	**Q28**		
1	2	3	2	4	4	3	3		

Booklet B

29a)	The blood vessels in the human circulatory system transport blood throughout the body, delivering oxygen and nutrients to cells and removing waste products like carbon dioxide.
29b)	The two substances that are more at point Y compared to point X are carbon dioxide and digested food (nutrients).
29c)	After eating, the volume of blood flow to the head decreases, while the volume of blood flow to the small intestine increases. This occurs because the body prioritizes digestion after a meal, diverting more blood to the small intestine to aid in the absorption of nutrients, which reduces the amount of blood flowing to the head.
30a)	The advantage of the dispersal method of Fruit A is that it can scatter its seeds over a wider area when the pod bursts open, reducing competition among seedlings for resources in close proximity.
30b)	Seed C: The seeds of fruit C are dispersed by sticking to animals' fur with their hooks Seed D: The seeds of fruit D are dispersed when animals eat the fruit and later excrete the seeds in a different location

30c)	The fruit of plant E is dispersed by animal Z because the fruit gives off an unpleasant smell, similar to the dung that attracts animal Z. The animal is likely to carry the fruit to its nest, helping in seed dispersal.
31a)	Animal S: Animal S benefits from the nectar produced by Plant P, which provides it with food. Plant P: Plant P benefits from the droppings of animal S, which are rich in mineral salts and can be converted into nutrients by the plant.
31b)	Animal S helps Plant P by preying on aphids, which are harmful to the plant.
32a)	Animal V uses its spider-looking tail to attract prey by mimicking the appearance and movements of a spider. When the prey approaches, Animal V can catch it.
32b)	possible answer: A possible behavioural adaptation for Animal V to stay cool in the hot desert could be staying in shaded areas or burrowing during the hottest part of the day. Move Sideways so as to decrease the contact with the hot surface area.
33a)	Lucas can find the volume of the plasticine sculpture by submerging it in water in a measuring cylinder. The amount of water displaced by the sculpture is equal to its volume. Alternate Answer: He can pour the water into the measuring cylinder and measure the original placement of water. Then, he can put the plasticine sculpture into the measuring cylinder. He then can take the volume of the plasticine, and the water subtract the original volume of the water to find the volume of the plasticine sculpture.
33b)	The total volume of the three plasticine balls will be the same as the volume of the original plasticine sculpture because the amount of matter (plasticine) does not change, only its shape does.
34a)	The aim of Luke's experiment is to measure how much light passes through different materials
34b)	Material Z is the most suitable for making the screen for the shadow puppet show because it allows the least light to pass through, creating a clearer shadow.
35a)	Dew forms on the surfaces of the grass when water vapor in the air cools and condenses into tiny droplets as the temperature drops in the early morning.

	Alternate answer: The water in the surrounding evaporate to form water vapour. Then it comes into contact with the cooler surface of the grass, loses heat and condenses to form water droplets which are the dew that form on the surfaces of the grass,
35b)	The dew disappeared after the sun rose because the heat from the sun caused the water droplets to evaporate Alternate answer: The dew gained heat from the sun and evaporated to form water vapour.
35c)	A corrugated surface would be better in collecting dew compared to a flat surface because the grooves on the corrugated surface can channel the dew more effectively towards the center, where it can be collected.
36a)	The bulb and sound box were likely connected in series, so when the bulb blew, the circuit was broken, stopping the flow of electricity to the sound box. Alternate answer: Series
36b)	The toy did not give off any light or sound when the switch was at position B because position B was an off position where the circuit was incomplete. Alternate answer: It was not connected to either the switch with the light or sound, so electricity could not flow through, hence the toy did not give off any light.
36c)	

37a)	Temperature is a way of telling how hot or cold something is
37b)	The temperature of the water in the metal cup decreased over the next 40 minutes. As time passed, the metal cup lost heat to the surroundings, causing the water temperature to gradually drop. Alternate answer: From the 1st to the 20th Minute, the temperature of water in the metal cup decreased from 80 °C to 25 °C. from the 20th to the 40th minutes, the temperature of the cup remained constant at 25 °C
37c)	Using the same volume of water at the same temperature ensures a fair test because it controls the amount of heat energy present at the start of the experiment. This way, any differences observed in the temperature changes can be attributed to the material of the cup rather than variations in the amount or starting temperature of the water.
37d)	The ceramic cup would keep ice cubes from melting for a longer period of time. This is because ceramic is a better insulator than metal, meaning it slows down the transfer of heat from the surroundings to the ice cubes, keeping them colder for longer.
38a)	A: Gravational potential energy B: Kinetic energy
38b)	i) The pendulum continues to swing a few more times because of the kinetic energy it had before the electricity was cut off. The energy allows it to keep moving until it is gradually lost due to friction and air resistance. ii) The pendulum finally comes to a stop because the kinetic energy is gradually converted to other forms of energy, such as heat due to friction and air resistance. Without a continuous supply of energy (from the electricity), the pendulum loses all its kinetic energy and stops.
39a)	Iron bar X becomes the stronger electromagnet when the switch is closed because it has more coils of wire wrapped around it compared to iron bar Y. The strength of an electromagnet is directly related to the number of coils of wire around the iron core and the amount of current flowing through the wire. Therefore, with more coils, iron bar X generates a stronger magnetic field, making it the stronger electromagnet in this setup.
39b)	The vending machine dispenses only one packet of food each time the button is pressed because of the way the electromagnet and the mechanical system are designed to work together.

	When the button is pressed, an electrical circuit is completed, which activates the electromagnet. The electromagnet generates a magnetic field that pulls a metal lever or gate. This lever is connected to the mechanism that holds the packets of food. As the lever is pulled, it allows just one packet of food to be released from the holding area. Once the packet is dispensed, the electromagnet is deactivated, and the lever returns to its original position due to the force of a spring or gravity. This movement resets the mechanism, ensuring that only one packet is released with each press of the button. The system is designed to prevent multiple packets from being dispensed at once, ensuring controlled and precise operation. The combination of the electromagnet's controlled activation and the mechanical design of the lever or gate system ensures that only one packet is dispensed per button press, making the vending machine efficient and reliable in its operation.
39c)	The vending machine will not work if the steel gate is changed to a copper gate because copper is not magnetic, so it will not respond to the electromagnet.
40a)	A possible hypothesis for Matthew's experiment is that the greater the mass of the block, the shorter the distance it will move when released by the spring.
40b)	Based on Matthew's experiment, the area of contact with the table did not affect the distance moved by the block because all blocks with the same mass moved the same distance regardless of their area of contact.
40c)	12cm