

NANYANG PRIMARY SCHOOL

**2022
PRIMARY 6
WEIGHTED ASSESSMENT 1**

**SCIENCE
(BOOKLET A)**

Total Time for Booklets A and B: 1 h 45 min

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not open this booklet until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. For each question from 1 to 28, four options are given.
Indicate your choice in this booklet.
Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.

Name: _____ ()

Class: Primary 6 ()

Booklet **B** consists of **19** printed pages excluding this cover page.

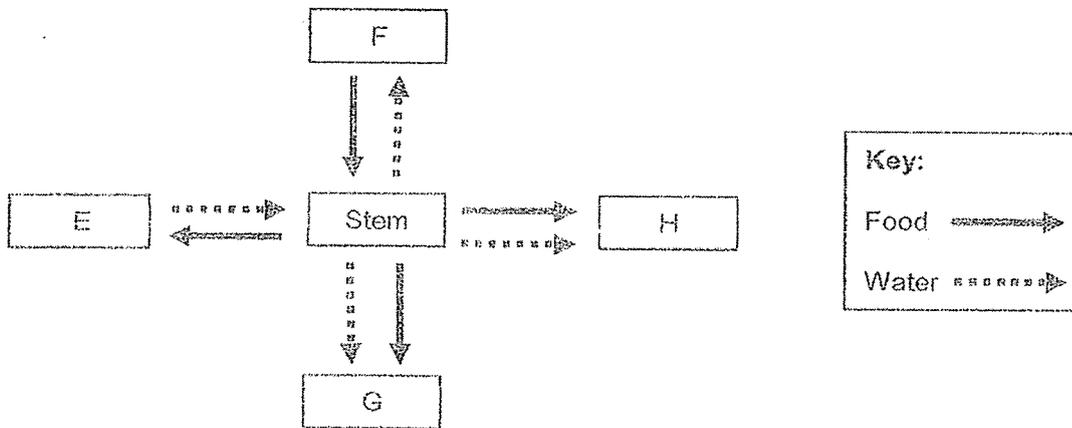
Section A: Multiple Choice Questions [56 marks]

1. Mr Lim was infected with a virus and one of his organs was affected. He was admitted to the hospital when he had difficulty breathing. In the hospital, his doctor found out that the oxygen level in his blood was lower than normal. Mr Lim was given an oxygen mask, which helped to provide him with extra oxygen.

Based on the information above, which one of Mr Lim's body systems was most likely not functioning well when he was infected with the virus?

- (1) Skeletal system
- (2) Digestive system
- (3) Muscular system
- (4) Respiratory system

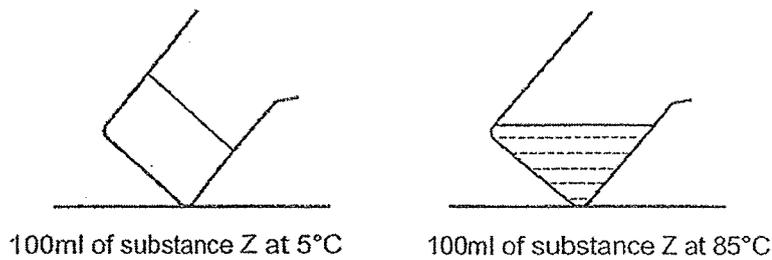
2. The diagram below shows how food and water are transported to different parts of a flowering plant.



Which of the following correctly identifies the parts, E, F, G and H, of the flowering plant?

	E	F	G	H
(1)	Roots	Flower	Leaves	Fruit
(2)	Roots	Leaves	Fruit	Flower
(3)	Leaves	Roots	Flower	Fruit
(4)	Fruit	Leaves	Flower	Roots

3. Lucas took substance Z out of the freezer and left it at room temperature before heating it to 85°C. The diagram below shows what he observed at 5°C and 85°C.



Based on Lucas' observations, which of the following is possible?

	Freezing Point of Z (°C)	Boiling Point of Z (°C)
(1)	10	120
(2)	3	100
(3)	15	70
(4)	0	105

4. John made the following observations, A, B and C.

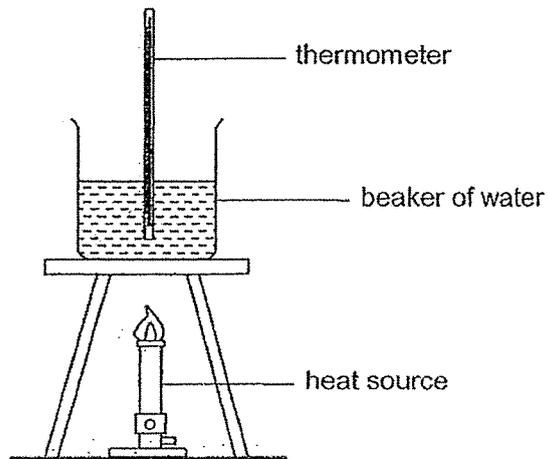
- A Hair drying quickly with the use of hair dryer.
- B Puddle of water disappearing under the hot sun.
- C Mist forming at the spout of a kettle of boiling water.

Which of the following observations are classified correctly?

	Evaporation	Condensation
(1)	A	B and C
(2)	A and B	C
(3)	B and C	A
(4)	C	A and B

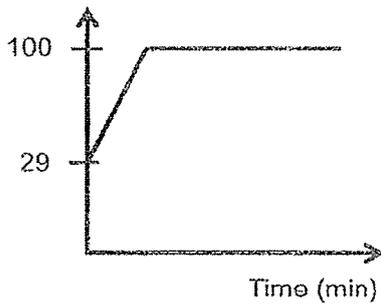
5. Mr Tan heated some water in a beaker as shown in the diagram below.

At regular intervals, Mr Tan measured the temperature of the water using a thermometer. Once the water boiled, he turned off the flame and continue to measure its temperature till the water cooled down to room temperature.

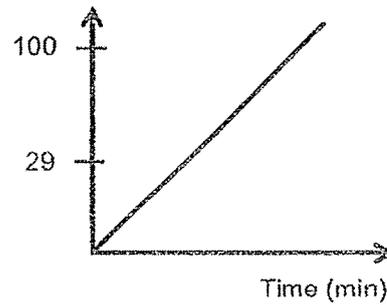


Which one of the following graphs shows the results that Mr Tan would most likely observe?

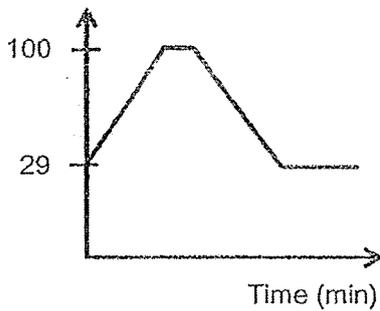
(1) Temperature ($^{\circ}\text{C}$)



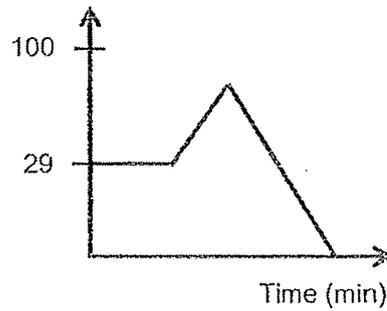
(2) Temperature ($^{\circ}\text{C}$)



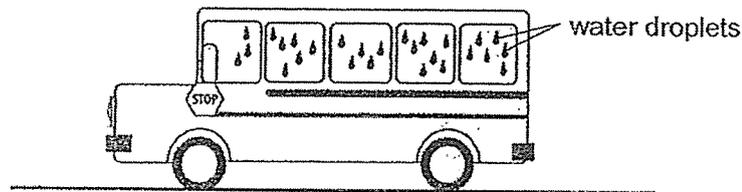
(3) Temperature ($^{\circ}\text{C}$)



(4) Temperature ($^{\circ}\text{C}$)

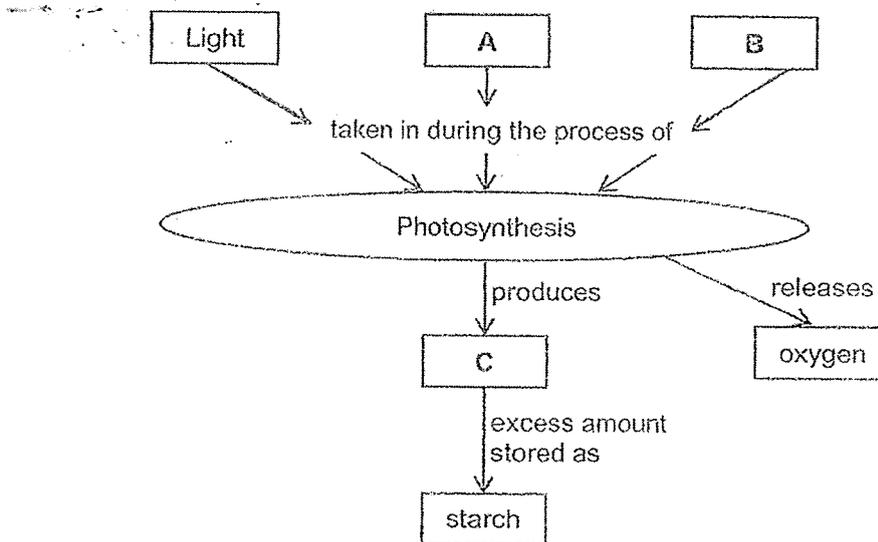


6. One morning, Arabelle took a bus to school. She observed water droplets forming on the outer surface of the bus windows as shown in the diagram below.



Which one of the following correctly explains her observation?

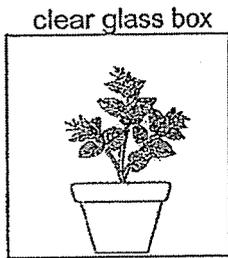
- (1) Water vapour from outside the bus lost heat and condensed on the window.
 - (2) Water vapour from outside the bus lost heat and evaporated on the window.
 - (3) Water vapour from outside the bus gained heat and condensed on the window.
 - (4) Water vapour from outside the bus gained heat and evaporated on the window.
7. Study the diagram shown below.



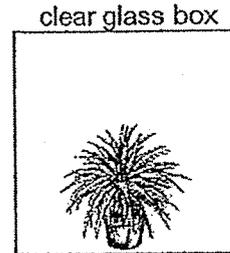
Which of the following best represents substances A, B and C?

	A	B	C
(1)	sugar	water	carbon dioxide
(2)	water	carbon dioxide	sugar
(3)	water	oxygen	sugar
(4)	oxygen	water	carbon dioxide

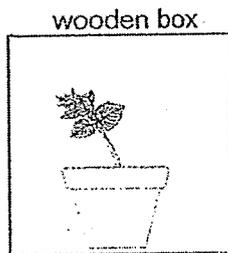
8. Ramesh wanted to carry out an experiment to find out if light is required for photosynthesis. He had four different set-ups. The plant in each set-up was watered before being placed in the different boxes. The set-ups were then placed in a sunny location for two days before being tested for the presence of starch.



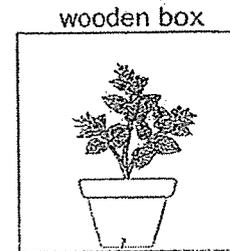
Set-up E



Set-up F



Set-up G

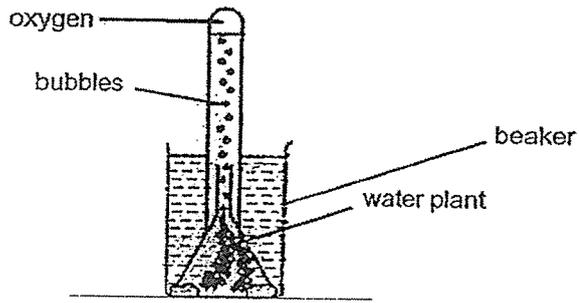


Set-up H

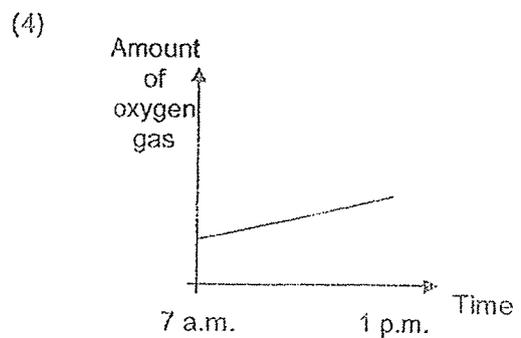
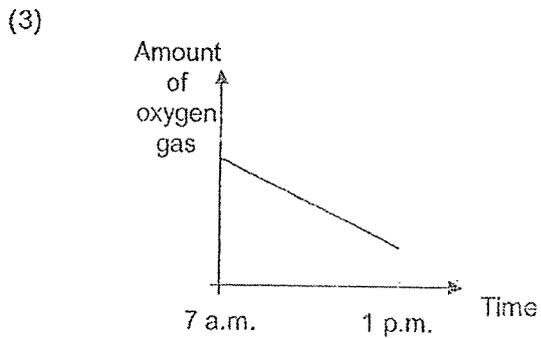
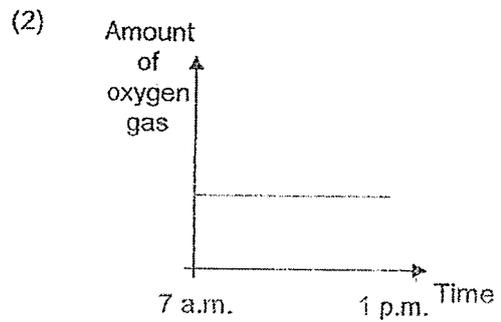
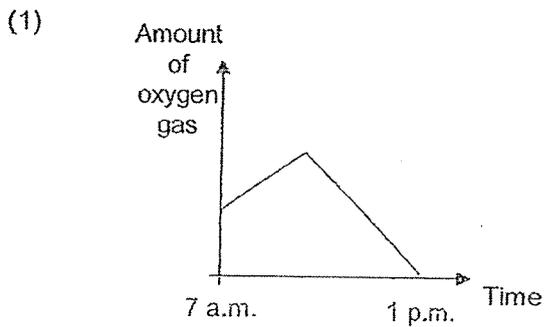
Which two of the above set-ups should he use for his fair experiment?

- | | | | |
|-----|-----------------|-----|-----------------|
| (1) | Set-ups E and G | (2) | Set-ups E and H |
| (3) | Set-ups F and G | (4) | Set-ups F and H |

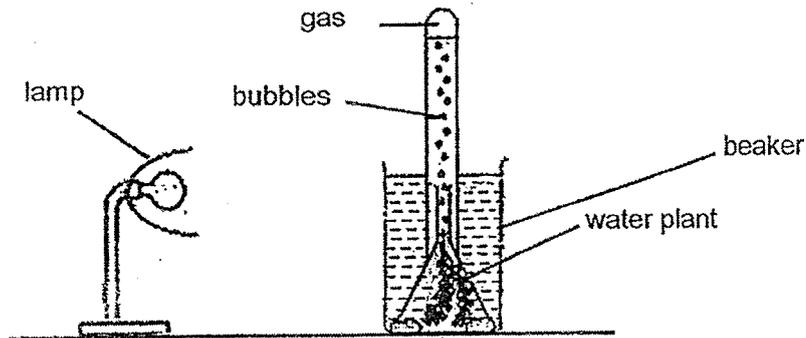
9. All placed the following set-up under the Sun from 7 a.m. to 1 p.m. He added a chemical that released carbon dioxide into the water at the start of his experiment.



Which one of the following graphs shows the most likely changes in the amount of oxygen in the set-up during the 6 hours?



10. Jack set up an experiment in a room as shown below.

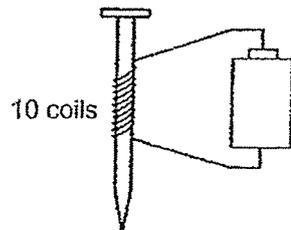


He placed the lamp 15 cm away from the beaker. After one hour, he observed that there was 4 cm³ of gas collected in the test tube. He repeated the experiment but changed the distance the lamp was placed from the beaker.

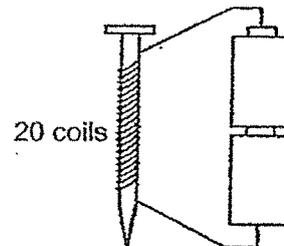
Which one of the following shows the most likely result when he repeated the experiment?

	Distance from beaker (cm)	Volume of gas collected (cm ³)
(1)	7	Less than 4
(2)	7	4
(3)	25	Less than 4
(4)	25	More than 4

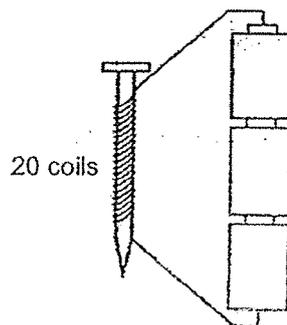
11. Janice wanted to find out how the number of coils of wire around the iron nail affects the strength of the electromagnet.



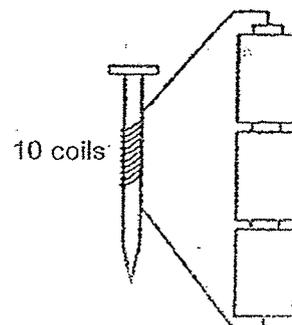
Set-up E



Set-up F



Set-up G



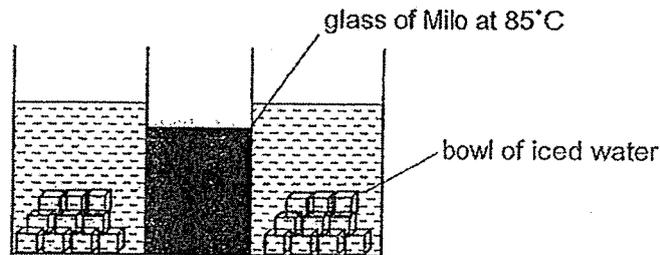
Set-up H

Which two set-ups should she use for her experiment?

- | | |
|---------------------|---------------------|
| (1) Set-ups E and F | (2) Set-ups E and H |
| (3) Set-ups F and G | (4) Set-ups G and H |
12. Which one of the following is not a source of light?

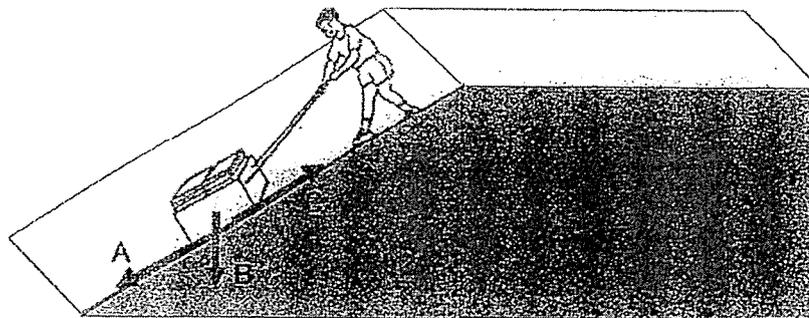
- | | |
|--------------|------------------|
| (1) the Sun | (2) a lit candle |
| (3) a mirror | (4) fire |

13. En Hui has a glass of hot Milo at a temperature of 85°C . She placed it in a bowl of iced water as shown below. The set-up was left at room temperature.



Which one of the following best explains what happened after 5 minutes?

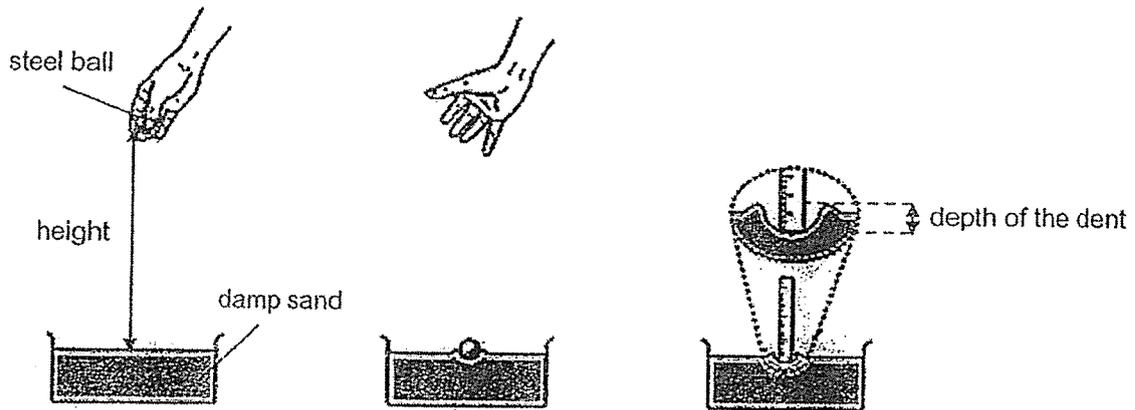
- (1) The Milo lost heat to the iced water and surrounding air.
 - (2) The Milo gained heat from the iced water and surrounding air.
 - (3) The Milo lost heat to the iced water but gained heat from the surrounding air.
 - (4) The Milo gained heat from the iced water but lost heat to the surrounding air.
14. Which one of the following is not an example of the effects of a force?
- (1) A cap blocking sunlight.
 - (2) A rolling ball slowing down.
 - (3) A ball being thrown by a boy.
 - (4) A basketball being inflated by a pump.
15. A boy pulled a box up a slope as shown in the diagram below.



Which of the following correctly shows the direction of the forces acting on the box?

	Gravitational force	Frictional force
(1)	B	C
(2)	B	A
(3)	C	A
(4)	C	C

16. Amy conducted an experiment where she dropped a steel ball onto a tray of damp sand as shown in the diagram below. She measured the depth of the dent made by the steel ball.



Then, she repeated the experiment by dropping the steel ball from different heights. She recorded the depth of the dent made by the steel ball in the table below.

Height at which the steel ball was dropped from (cm)	Depth of the dent (cm)
10	1.0
20	1.2
30	1.5
40	1.8
50	2.1

What was the relationship between the height at which the steel ball was dropped from and the depth of the dent?

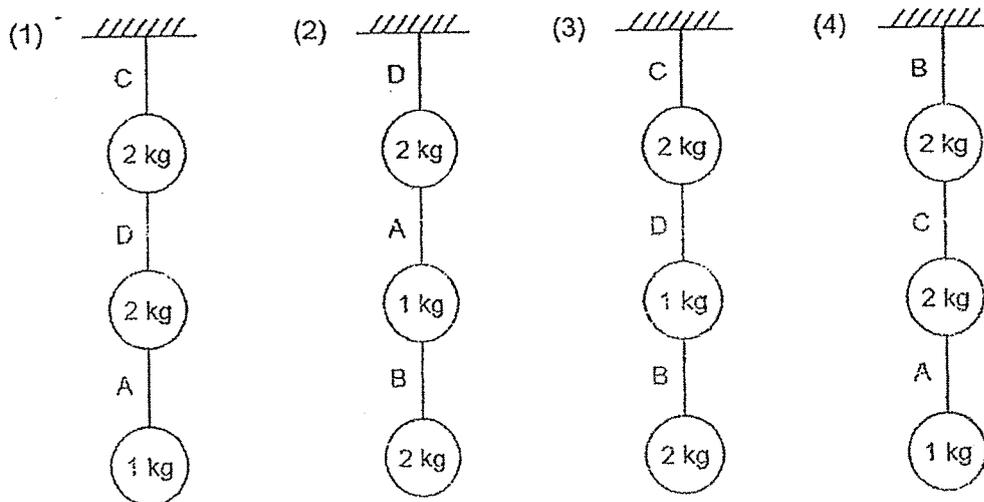
- (1) As the depth of the dent decreased, the height at which the steel ball was dropped from increased.
- (2) As the depth of the dent increased, the height at which the steel ball was dropped from increased.
- (3) As the height at which the steel ball was dropped from decreased, the depth of the dent increased.
- (4) As the height at which the steel ball was dropped from increased, the depth of the dent increased.

17. Tom tested four thick ropes made of different materials, A, B, C and D, by hanging weights from each of them. He increased the mass of the weights until the ropes broke. The maximum weight that each rope could hold before breaking is shown in the table below. Each rope has a mass of 1kg.

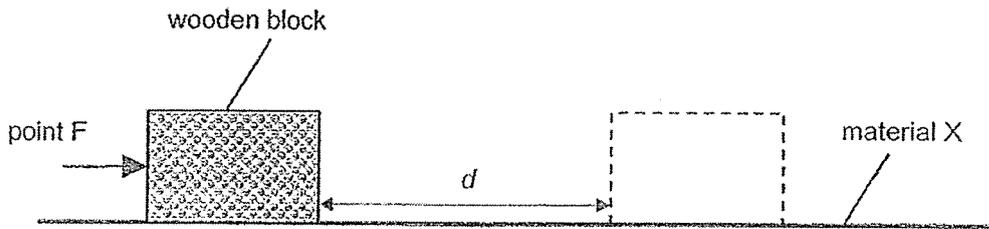
Material of rope	Mass of weights held by the rope before breaking (kg)
A	2
B	8
C	4
D	9

Tom then tried a few arrangements of hanging different weights using the different ropes.

Which one of the following arrangements is possible without breaking any of the ropes?



18. Jane placed a wooden block on a sheet made of material X. She gave the block a push at point F. The block moved forward by a distance, d , and stopped, as shown in the diagram below.



Using the same amount of force to push the wooden block at point F, she repeated the experiment using sheets made of materials, Y and Z. She then recorded her results in the table below.

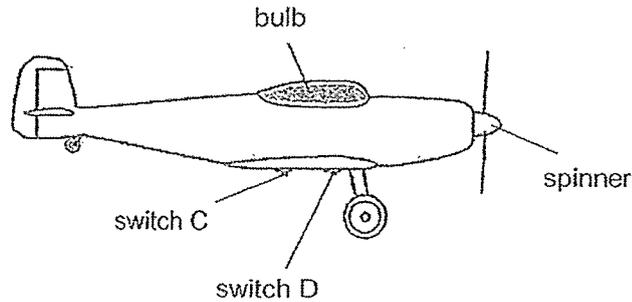
Material	X	Y	Z
Distance d (cm)	20	10	30

Jane wants to use one of the materials for the flooring of her elderly parents' bathroom so that they do not slip easily.

Based on her results above, arrange the materials from the most to the least suitable she should use for the flooring of the bathroom.

	most suitable	→	least suitable
(1)	Y	,	Z , X
(2)	Y	,	X , Z
(3)	Z	,	Y , X
(4)	Z	,	X , Y

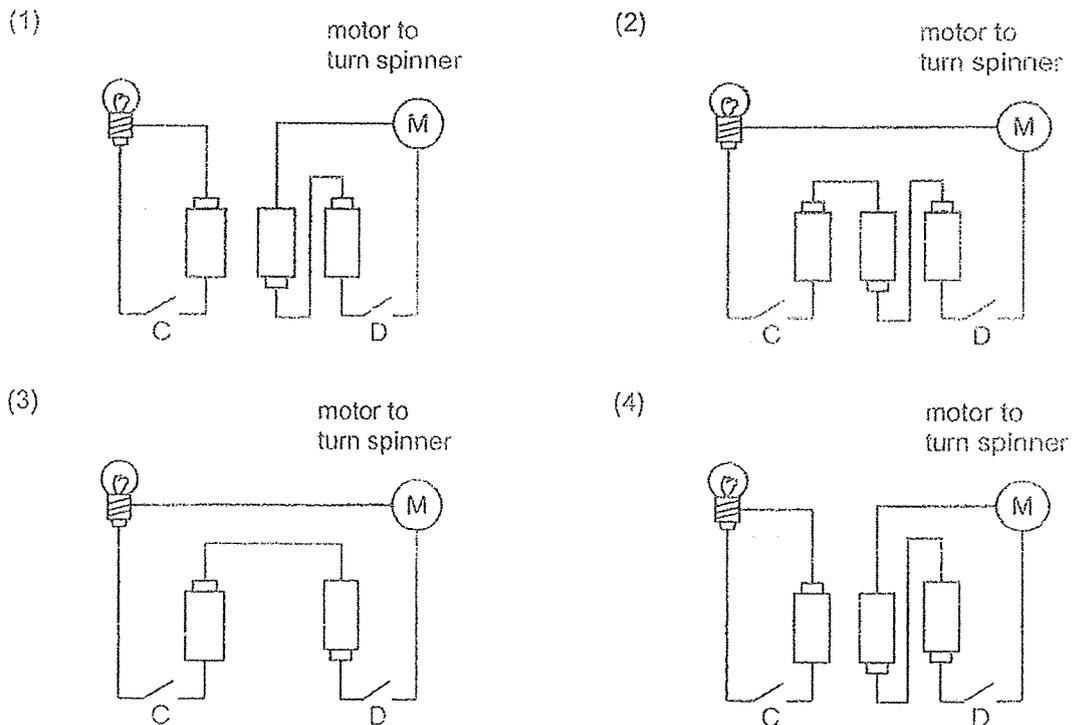
21. James has a toy plane that works on three batteries as shown below.



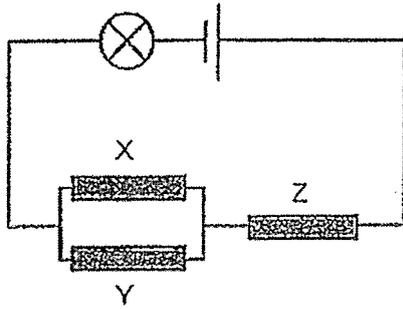
He made the following observations about his toy.

Switched on	Did the spinner turn?	Did the bulb light up?
C	no	yes
D	yes	no
C and D	yes	yes

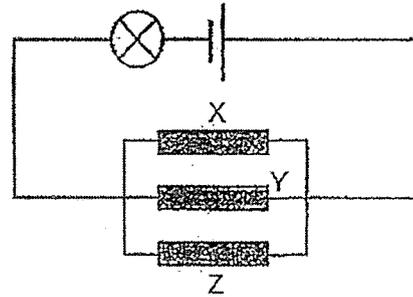
Which one of the following circuit diagrams correctly shows the most likely arrangement of the components inside the toy?



22. Janelle set up the circuits shown below to find out which material, X, Y or Z, is a conductor of electricity.



Setup 1



Setup 2

The bulb in setup 1 did not light up while the bulb in setup 2 lit up.

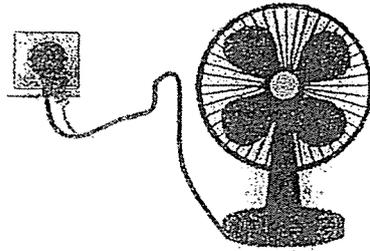
Which of the following correctly shows all the conclusion(s) that Janelle can make based on the results of her experiment?

	Electrical conductor	Electrical insulator
A	X	Y and Z
B	Z	X and Y
C	X and Y	Z
D	X and Z	Y

- (1) A and D only
 (3) A, B and C only

- (2) B and C only
 (4) B, C and D only

23. Which of the following forms of energy are useful for the fan to function?



- A Heat energy
- B Sound energy
- C Kinetic energy
- D Electrical energy

- (1) A and B only
- (3) A, B and C only

- (2) C and D only
- (4) B, C and D only

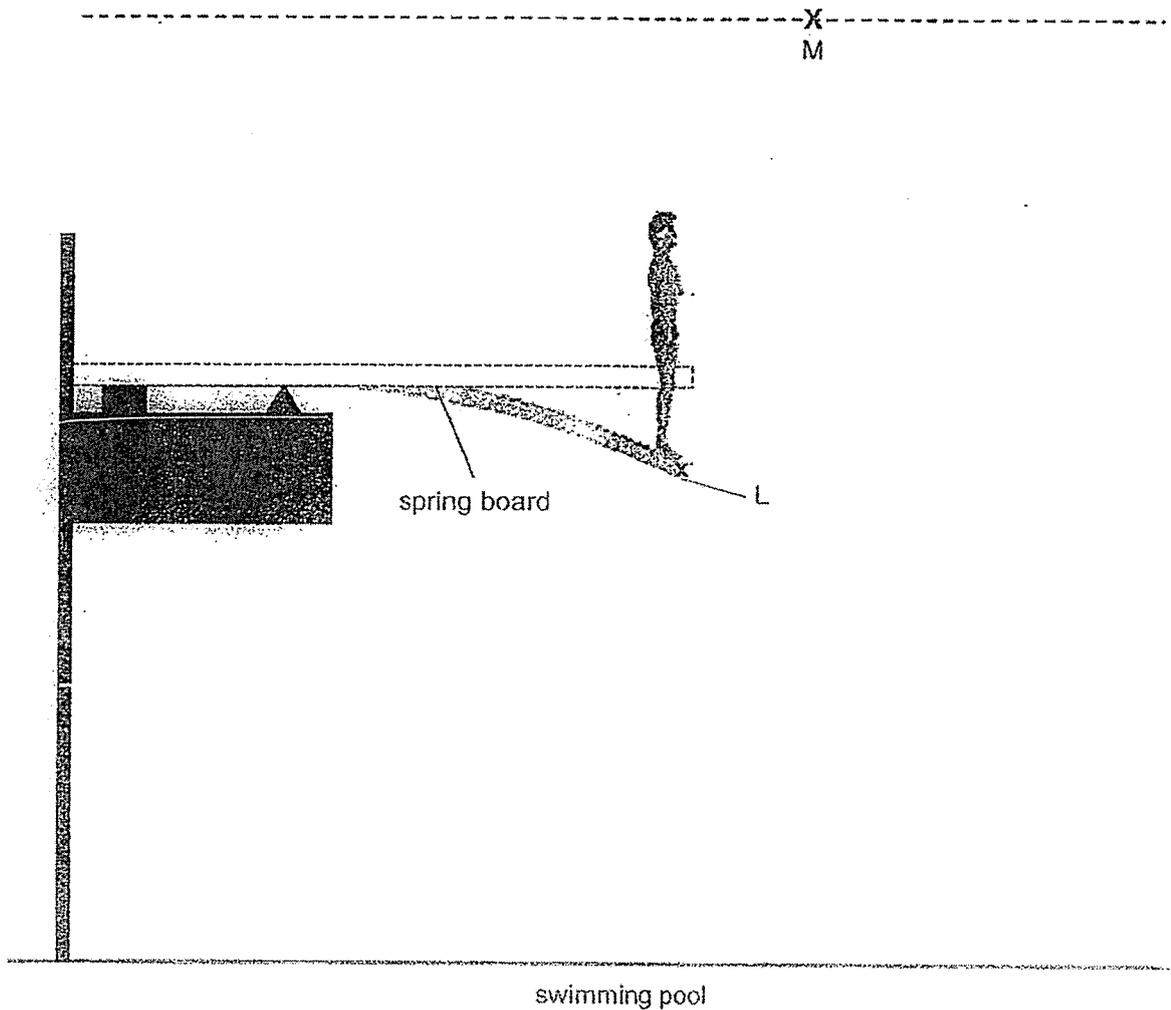
24. Which of the following possess potential energy?

- A Oil
- B Food
- C Charged batteries
- D Stretched rubber band

- (1) A and B only
- (3) B and D only

- (2) A and C only
- (4) A, B, C and D

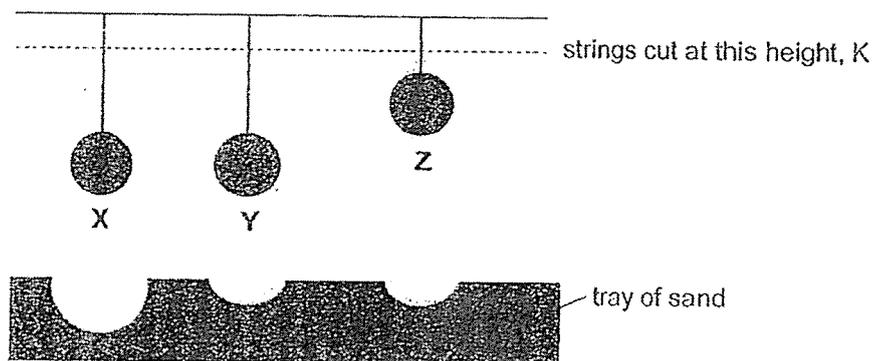
25. Josh jumps off a spring board into a swimming pool, as shown in the diagram below. He bounced off the spring board at point L. He reached the highest point, M, with a slight pause, before coming back down.



What are the main forms of energy that Josh possesses while jumping off the board at point L and when he is at point M?

	Point L	Point M
(1)	kinetic energy	kinetic energy and potential energy
(2)	potential energy	kinetic energy
(3)	kinetic energy and potential energy	kinetic energy
(4)	kinetic energy and potential energy	potential energy

26. Farah had three balls, X, Y and Z, of similar size but made of different materials. She hung them from a rod, then cut the strings at height K, causing the balls to land on a tray of sand. Dents were made by the balls in the sand as shown in the diagram below.



Based on the diagram above, which of the following statements is/are true?

- A X has a greater mass than Y.
- B Y has a greater mass than Z.
- C Y and Z have the same mass.

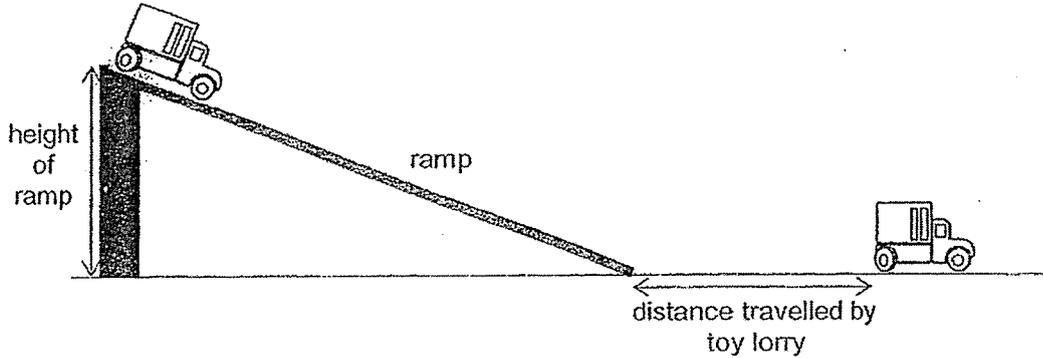
- (1) B only
- (2) C only
- (3) A and B only
- (4) A and C only

27. Sumin has a torch. When she inserts the batteries and turns on the switch, the bulb of the torch lights up.

Which of the following correctly shows the main forms of energy present at the following parts of the torch?

- | | <u>Batteries</u> | | <u>Wires</u> | | <u>Bulb</u> |
|-----|-------------------|---|-------------------|---|-------------------|
| (1) | electrical energy | → | light energy | → | heat energy |
| (2) | potential energy | → | heat energy | → | electrical energy |
| (3) | electrical energy | → | potential energy | → | light energy |
| (4) | potential energy | → | electrical energy | → | light energy |

28. Sheryl released a toy lorry at the top of a ramp, as shown in the diagram below.



She wanted to find out if the amount of potential energy present when the lorry is released affects the distance travelled by it.

Which of the following variables should be changed and which should be kept constant to ensure a fair test?

	Variable to keep constant	Variable to change
(1)	the distance travelled by the lorry	the height of the ramp
(2)	the surface that the lorry travels on	the distance travelled by the lorry
(3)	the height of the ramp	the surface that the lorry travels on
(4)	the surface that the lorry travels on	the height of the ramp

~ END OF BOOKLET A ~



NANYANG PRIMARY SCHOOL

**2022
PRIMARY 6
WEIGHTED ASSESSMENT 1**

**SCIENCE
(BOOKLET B)**

Total Time for Booklets A and B: 1 h 45 min

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not open this booklet until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Write your answers to Questions 29 to 40 in the spaces provided.

Booklet A:		56
Booklet B:		44
Total:		100

Name: _____ ()

Class: Primary 6 ()

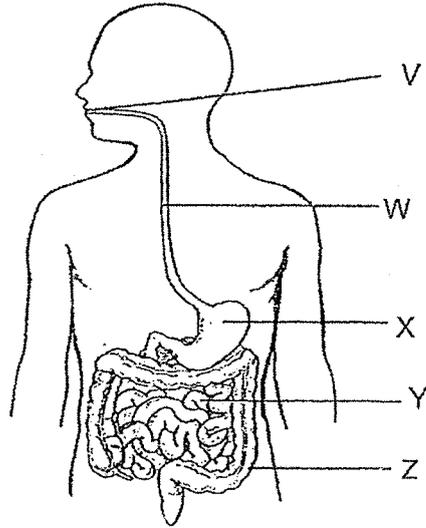
Parent's signature: _____

Please sign and return the paper the next day. Any queries should be raised at the same time when returning the paper.

Booklet B consists of 15 printed pages excluding this cover page.

Section B: Open-Ended Questions [44 marks]

29. The diagram below shows the human digestive system.



(a) In the table below, identify the part of the human digestive system by writing V, W, X, Y or Z and describe its main function. [2]

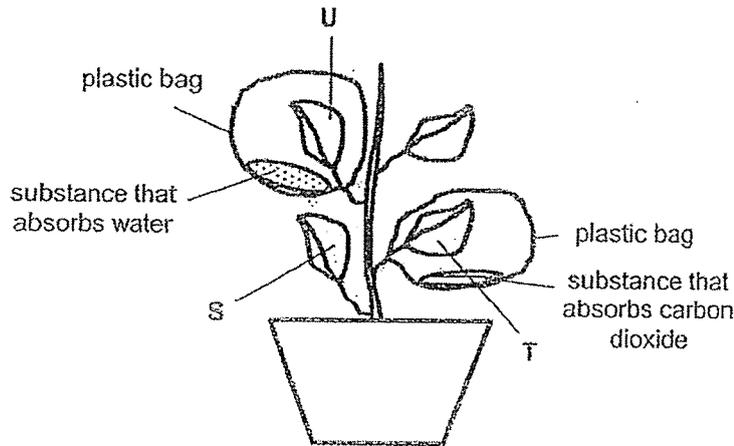
	Part	Name of the part	Function of the part
(i)		stomach	
(ii)		large intestine	

(b) Besides digesting food, describe another function of part Y. [1]

(c) Explain how chewing helps to speed up the process of digestion. [1]

30. Ben wanted to carry out an experiment to find out the conditions needed for photosynthesis.

After placing a potted plant in the dark for 24 hours, he wrapped two leaves using a clear plastic bag each and placed different substances in each bag. The substances would absorb either carbon dioxide or water from the surrounding. He watered the plant before placing the set-up in a sunny location. His set-up is shown below.



He placed the plant under bright sunlight for 6 hours, from 8 a.m. to 2 p.m. He then carried out the iodine test to check for the presence of starch. The presence of starch would cause the iodine to turn blue-black, while a yellowish-brown indicates the absence of starch.

(a) State the part found in the leaf that allows it to trap light. [1]

(b) In the table below, put a tick (✓) in the correct box to show the results of the iodine test when leaf S and T are tested for the presence of starch. [1]

Leaf	Colour of iodine when tested for the presence of starch	
	Yellowish-brown	Blue-black
S		
T		

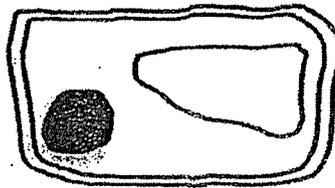
Ben tested leaf U for the presence of starch.

(c) What would the colour of the iodine on leaf U be? Explain your answer. [2]

31. The table below provides some information on three cells, A, B and C. A tick (✓) indicates the presence of the part of the cell.

Cell Part	Cell		
	A	B	C
Nucleus	✓	✓	✓
Cytoplasm	✓	✓	✓
Cell membrane	✓	✓	✓
Cell wall		✓	✓
Chloroplast		✓	

Sally observed a cell under the microscope, as shown below.

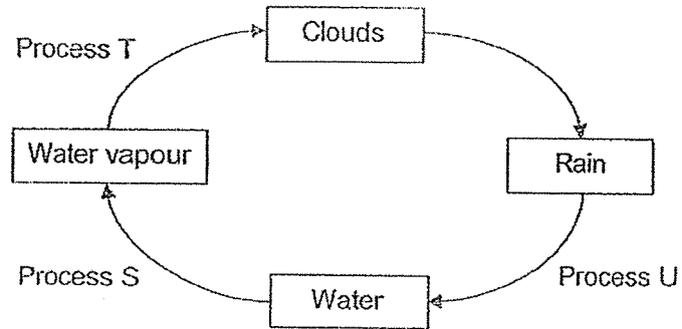


- (a) Which cell, A, B or C, is the cell above likely to be? [1]

- (b) Is the cell in (a) likely to be a plant or animal cell? Explain your answer. [1]

- (c) State the function of the cell membrane. [1]

32. The diagram below shows the water cycle.



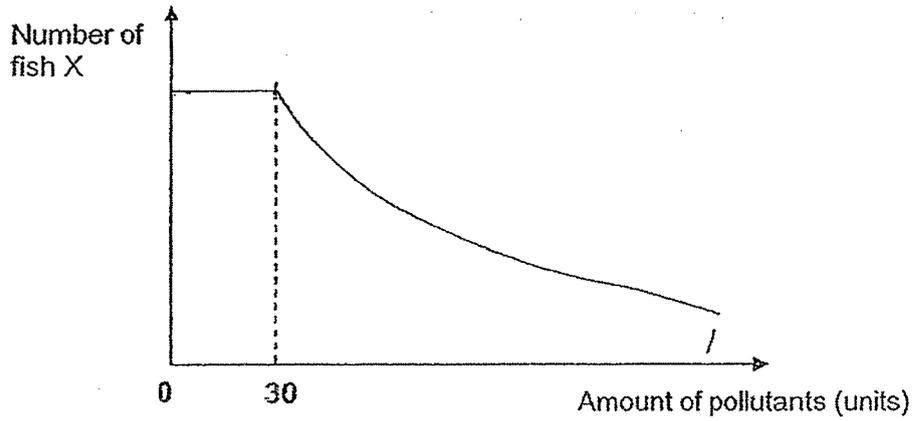
(a) Place a tick (✓) in the boxes below to indicate if processes S, T and U involve a change of state of water. [1]

	Change of state of water	No change of state of water
Process S		
Process T		
Process U		

(b) Why is the Sun important in the water cycle? [1]

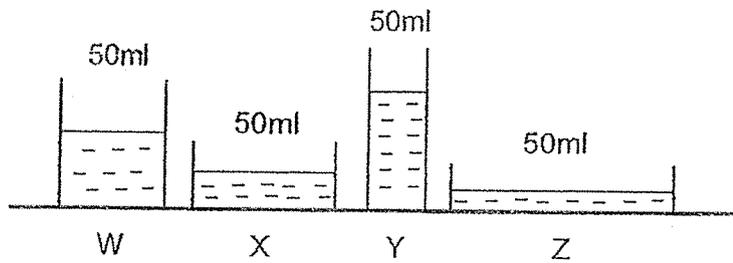
(Continue question 32)

The graph below shows the change in the number of fish X when the amount of pollutants in a lake changes.



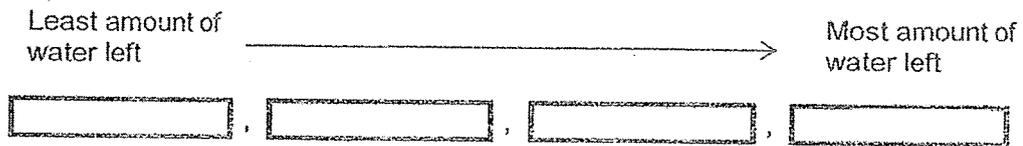
- (c) Based on the graph, what is the relationship between the number of fish X and the amount of pollutants in the lake? [2]

33. Ryan has four containers, W, X, Y and Z, made of the same material. He filled each container with the same amount of water as shown in the diagram below.



The four containers were placed on the teacher's table in the classroom for 2 days. The amount of water left in each container was then measured.

- (a) Arrange the containers from the one with the least amount of water left to the one with the most amount of water left, by writing the letters W, X, Y and Z in the boxes provided. [1]



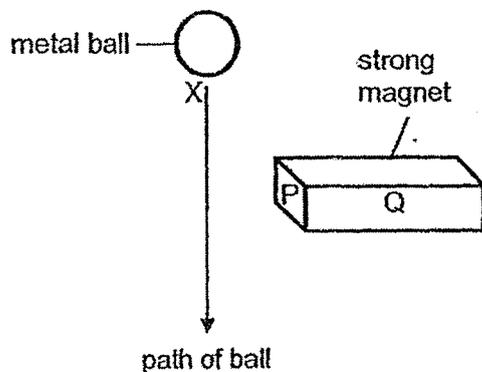
- (b) State the variable that was changed in this experiment. [1]

Alina placed her kettle filled with water on a hot plate. After 15 minutes, the water in the kettle boiled and she noticed some mist forming near the spout of the kettle as shown in the diagram below.



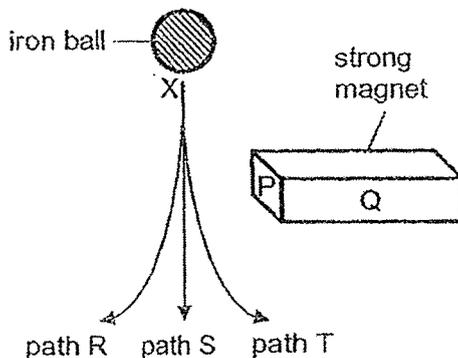
- (c) Explain how the mist was formed at the spout of the kettle. [2]

34. Tom dropped a light metal ball downwards from point X past a strong magnet with sides P and Q as shown below.



- (a) Explain why the metal ball was able to move past the magnet in a straight line without being attracted. [1]

Next, he dropped a similar iron ball downwards from X in the same way. The iron ball moved down path T.



- (bi) Explain why the iron ball moved down path T. [2]

- (bii) Tom turned the magnet such that side Q faced the iron ball. He observed that the iron ball moved down path S instead of path T.

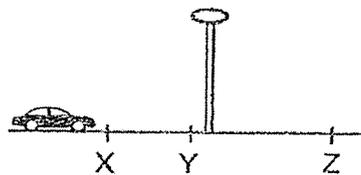
With reference to sides P and Q explain his observation. [1]

35. Ben watched a car drive past some lamp posts at night. He observed that the shadow of the car was formed on the ground.

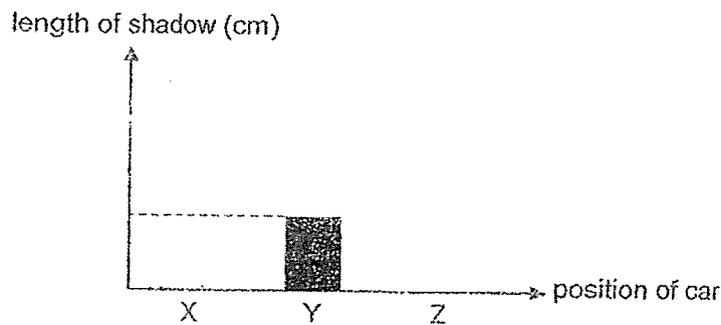


- (a) State how the shadow of the car was formed. [1]

The size of the car's shadow was observed to change as it passed points X, Y and Z as shown in the diagram below.



- (b) Using the bar graph provided below, draw the lengths of the shadows of the car as it passed points X and Z. The shadow at point Y has been drawn for you. [1]



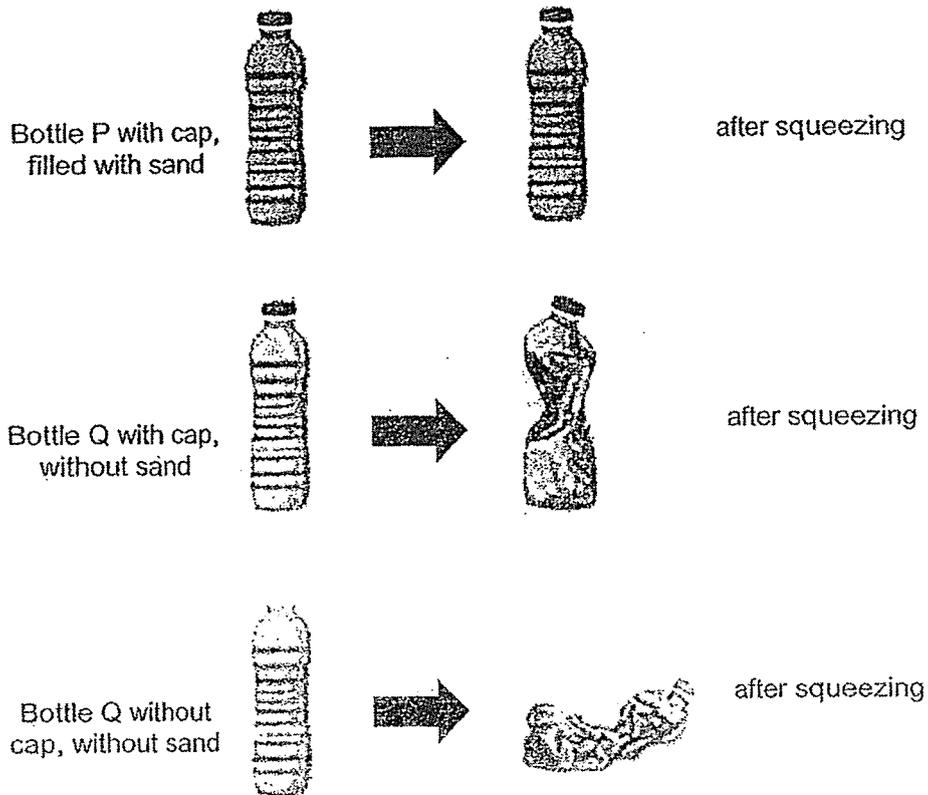
Ben always drives his car at night and wants to find out how his car can be more easily seen by other road users. Hence, he did an experiment to find out the amount of light reflected by car paints of different colours and recorded his results in the table below.

Colour of car paint	Amount of light detected by light sensor (units)
silver	950
black	500
green	700

- (c) Based on the results of his experiment, which colour should he paint his car in order to be seen most easily by other road users. Give a reason for your answer. [2]

36. Rajah had two plastic bottles, P and Q. P was filled completely with sand and Q has no sand inside. When the bottles were capped tightly, he could not squeeze bottle P at all but he could squeeze bottle Q slightly.

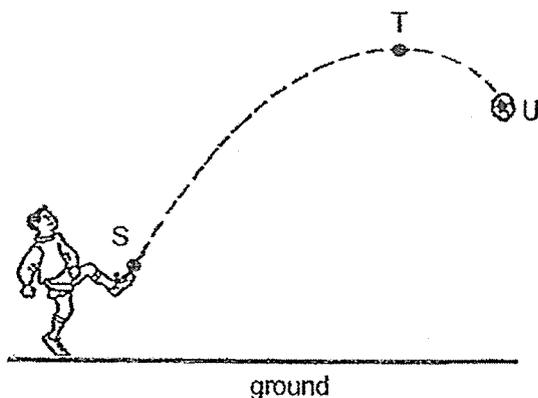
When he removed the bottle cap from the bottle Q and squeezed the bottle, the bottle was almost flattened, as shown in the diagram below.



(a) State the property of air that caused the slight change in bottle Q, after squeezing, when the bottle cap was on. [1]

(b) Explain how bottle Q could be almost flattened when the bottle cap was removed. [1]

37. The diagram below shows the path of a ball after Mingli kicked it. The ball moved from S to T to U.



(a) Besides the force exerted by Mingli on the ball, state another force that is acting on the moving ball. [1]

Next, Mingli kicked a heavier ball from the same starting point, S, with the same force and in the same direction.

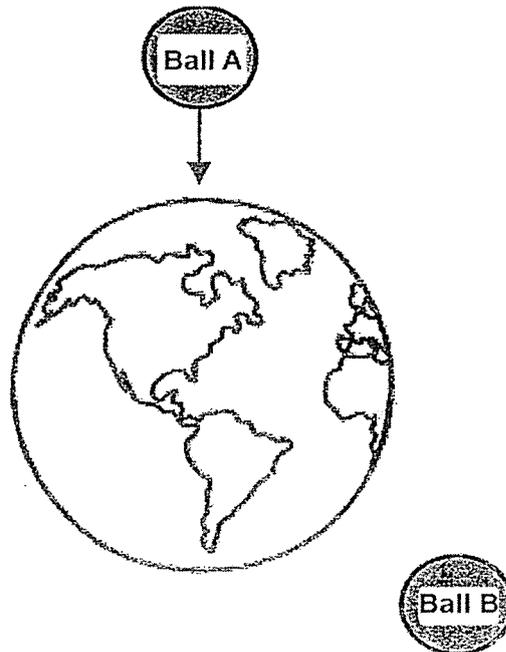
(b) In the diagram above, draw the path of movement of the heavier ball. [1]

After Mingli kicked both the balls, he noticed that the balls will bounce a few times and roll a short distance on the ground before coming to a stop.

(c) Describe the force that had caused the moving ball to stop rolling on the ground. [1]

(continue from question 37)

Gravitational force acts on all objects on Earth so that they do not fall into space. The gravitational pull of Earth on Ball A has been drawn for you in the diagram below.

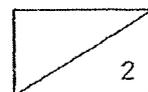


(di) In the diagram above, draw an arrow to show the gravitational pull of Earth on Ball B. [1]

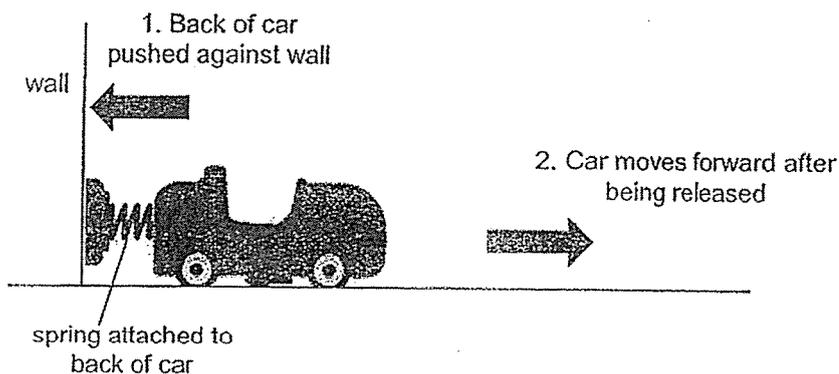
Mingli had a battery-operated toy train. He observed that the toy train moved slower from X to Y than from Y to Z, as shown in the diagram below.



(dii) Explain, in terms of forces, why the toy train moved slower from X to Y. [1]



38. Tara has a toy car with a spring attached to its back. In order for the car to move forward, she has to push the back of the car against the wall before releasing it, as shown in the diagram below.



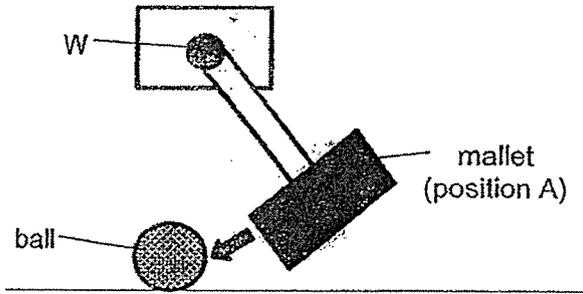
- (a) Describe the energy conversion that took place when the toy car moved forward after being released. [1]

Tara has another similar toy car, but with a different length of the same type of spring attached to it. She conducted an experiment using both toy cars and measured the distance travelled by each car.

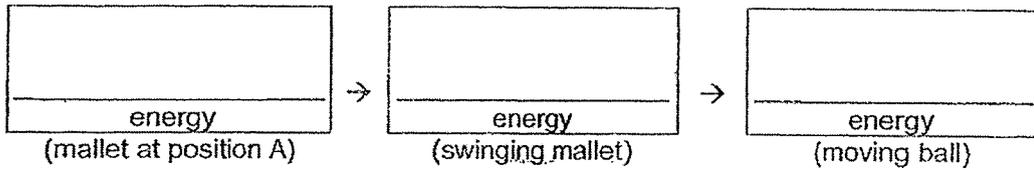
- (b) State the aim of her experiment. [1]

- (c) What should Tara do to ensure that the results of her experiment are reliable? [1]

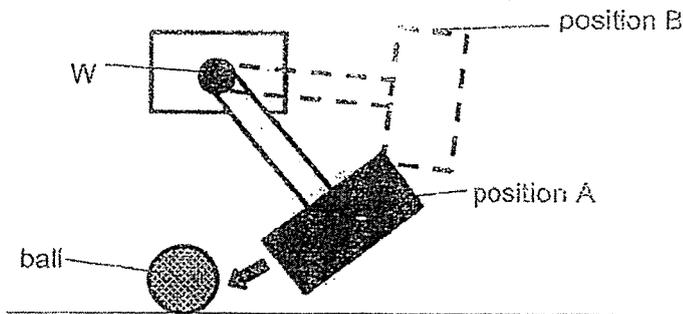
39. The diagram below shows a mallet connected at point W. It is allowed to swing freely about W. When released from position A, it will swing and hit the ball.



- (a) State the main forms of energy conversion as the mallet is released at position A and hits the ball, causing it to move. [1]



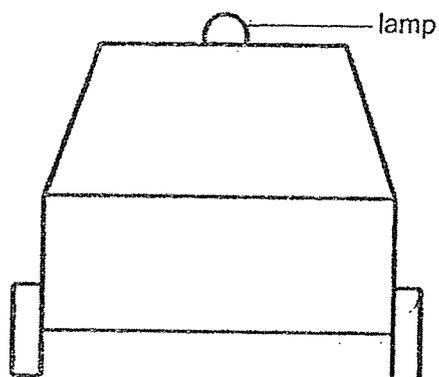
The mallet can also be released from position B as shown below.



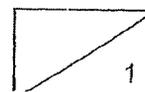
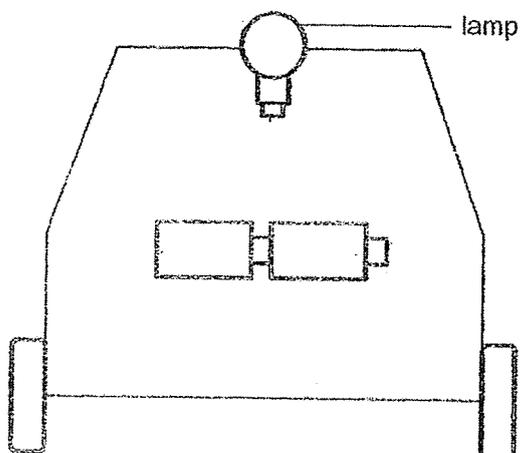
- (b) Which position, A or B, will cause the ball to travel a further distance when the mallet is released? Explain your answer in terms of energy. [2]

- (c) Explain, in terms of energy, why the ball stopped moving after some time. [1]

40. The diagram below shows a toy car with a lamp.

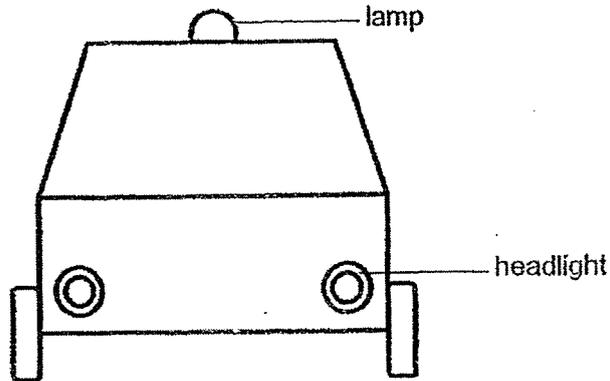


(a) In the diagram of the toy car provided below, draw wires to show how the lamp is connected to the batteries. [1]



(continue from question 40)

Two headlights were added to the toy car as shown below.

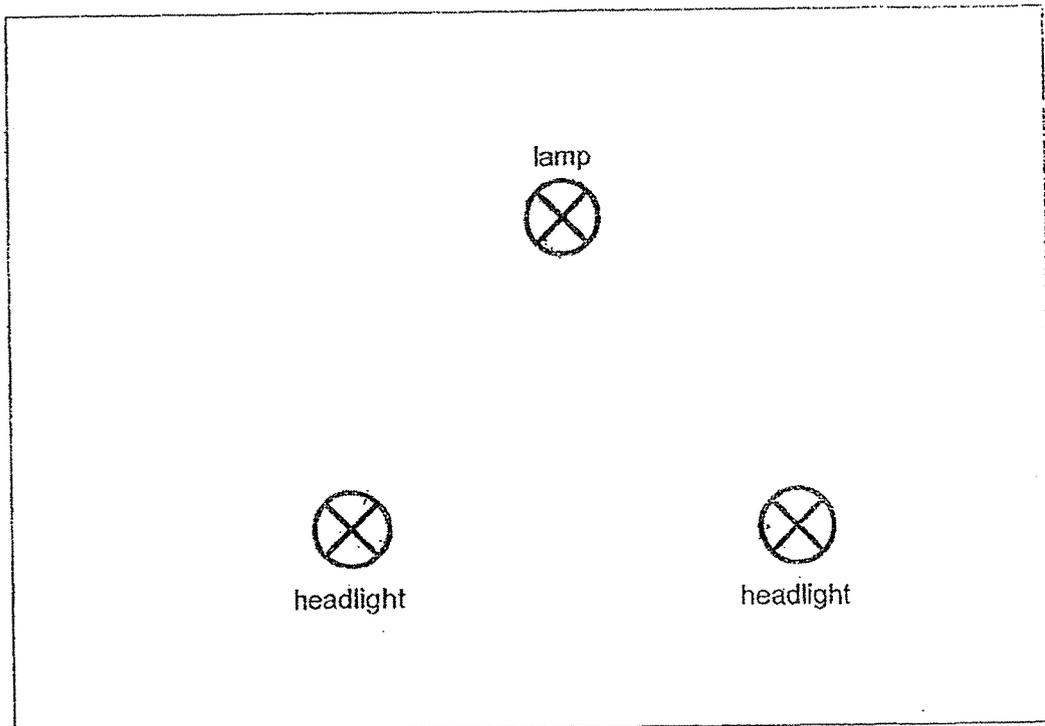


(b) Complete the circuit diagram below by drawing the following:

[2]

- 2 switches
- 2 batteries
- Lamps and headlights controlled independently
- Both headlights can be turned on together

You do not have to draw the car. The bulbs had been drawn for you.



~ END OF BOOKLET B ~

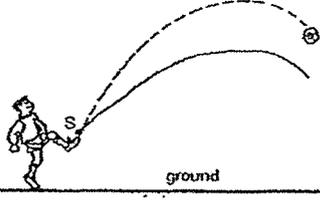
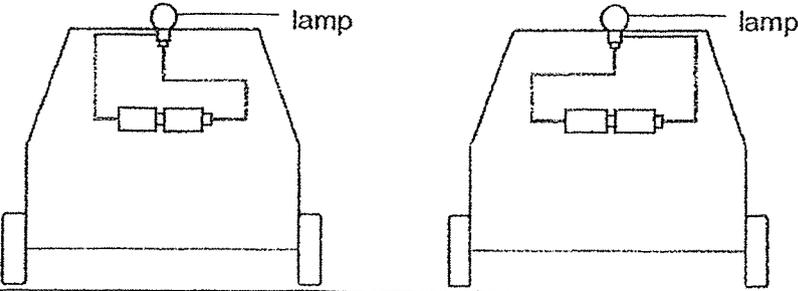
Nanyang Primary School
P6 SCIENCE WA1 2022
Answer Key

Section A

1	4	6	1	11	4	16	4	21	4	26	3
2	2	7	2	12	3	17	4	22	3	27	4
3	1	8	2	13	1	18	2	23	2	28	4
4	2	9	4	14	1	19	2	24	4		
5	3	10	3	15	2	20	3	25	4		

Section B

Qn No	Acceptable Answers
29a.	(i) X. Breaks down food into simpler substances. (ii) Z. Absorbs water from undigested food.
29b.	Absorbs digested food into the bloodstream.
29c.	Chewing breaks up food into smaller pieces, increasing the surface area of food in contact with the digestive juices.
30a.	Chlorophyll / Chloroplast
30b.	Leaf S – iodine turns blue-black. Leaf T – iodine remains yellowish-brown
30c.	Blue-black. The leaf can still get water from the roots so photosynthesis can take place
31a.	Cell C
31b.	It is a plant cell as it has a cell wall. Only plant cells have cell walls.
31c.	The cell membrane controls the movement of substances into and out of the cell.
32a.	Process S & T – change of state of water Process U – no change of state of water
32b.	Water from the water bodies gains heat from the Sun to evaporate.
32c.	As the amount of pollutants increases from 0 to 30 units, the number of fish X remains the same. Beyond 30 units of pollutants, as the amount of pollutants increases, the number of fish X decreases.
33a.	Z, X, W, Y
33b.	Exposed surface area of water
33c.	Steam from the boiling water came into contact with the cooler surrounding air, lost heat and condensed to form water droplets.
34a.	The metal ball is non-magnetic.
34bi.	Iron is a magnetic material. Hence, the magnet attracted the iron ball.
34bii.	The magnet is the strongest at its poles. Hence, Q has a weaker magnetic strength than P and could not attract the iron ball.
35a.	The car blocked the light from the lamp post.
35b.	The shadow for X must be longer than Y but shorter than Z.
35c.	Silver. The most amount of light is detected by the light sensor so most light is reflected from the silver paint.
36a.	Air can be compressed/ Air has no definite volume.
36b.	With the bottle cap removed, air that was occupying space in the bottle can now escape.

Qn No	Acceptable Answers
37a.	Gravitational force/ gravity/ frictional force/ friction
37b.	
37c.	Friction between the ball and the floor
37di.	
37dii.	The train is going against gravitational force from X to Y.
38a.	Potential energy of the compressed spring will be converted to kinetic energy of the car.
38b.	To find out how the length of the spring affects the distance travelled by the toy car.
38c.	She should do the experiment at least three times and find the average.
39a.	(Gravitational) potential energy [of mallet at position A] → kinetic energy [of swinging mallet] → kinetic energy [of moving ball]
39b.	Position B. At B, the mallet is released from a <u>greater</u> height so it will have <u>more</u> potential energy which would convert to more kinetic energy of the mallet and ball.
39c.	All the kinetic energy of the ball was converted to heat and sound energy.
40a.	
40b.	