CHIJ ST NICHOLAS GIRLS' SCHOOL

Primary 6
Mid-Year Assessment

SCIENCE

BOOKLET A

12 May 2022

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

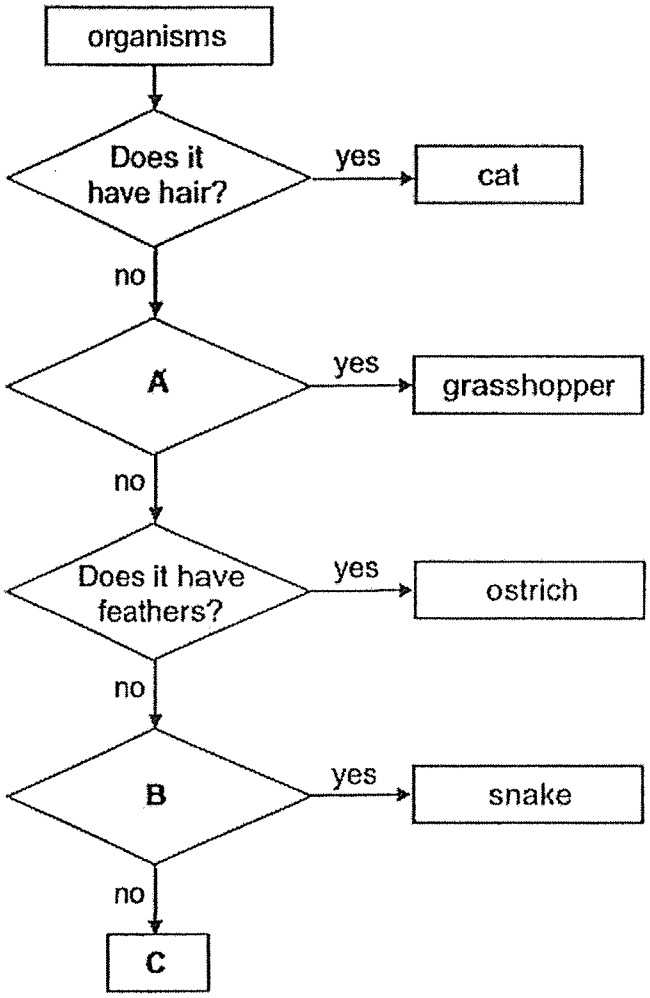
28 questions
56 marks

Do not open this booklet until you are told to do so.
Follow all instructions carefully.
Answer all questions.

This booklet consists of 17 printed pages.

Section A (28 x 2 marks = 56 marks)
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). Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.

1. Study the chart below.



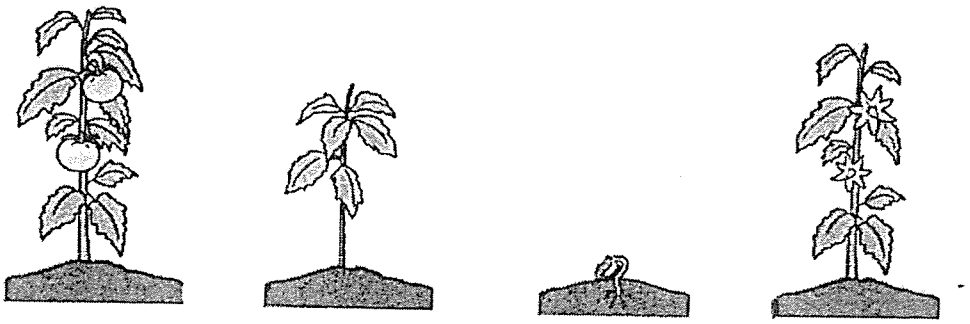
Which of the following best represents A, B and C?

	A	B	C
(1)	Does it have 6 legs?	Does it have moist skin?	lizard
(2)	Does it have wings?	Does it reproduce by laying eggs?	dog
(3)	Does it have a hard outer covering?	Does it have scales?	frog
(4)	Does it have 3 body parts?	Does it have a 3-stage life cycle?	cockroach

2. Which of the following plant parts is correctly matched to its function?

	Plant part	Function
(1)	leaves	take in water for the plant
(2)	fruits	attract animals to eat them
(3)	roots	hold the plant firmly to the ground
(4)	stem	transports oxygen to all parts of the plant

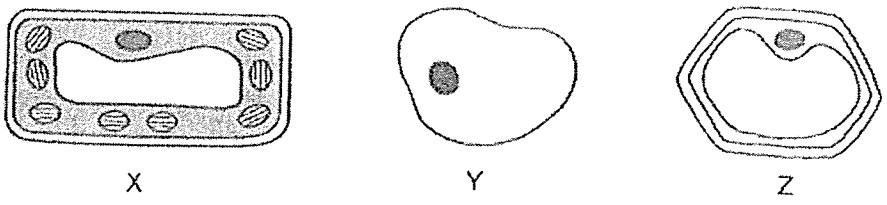
3. The diagram below shows a plant at different stages of its development.



Which of the following shows the correct order of its development?

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

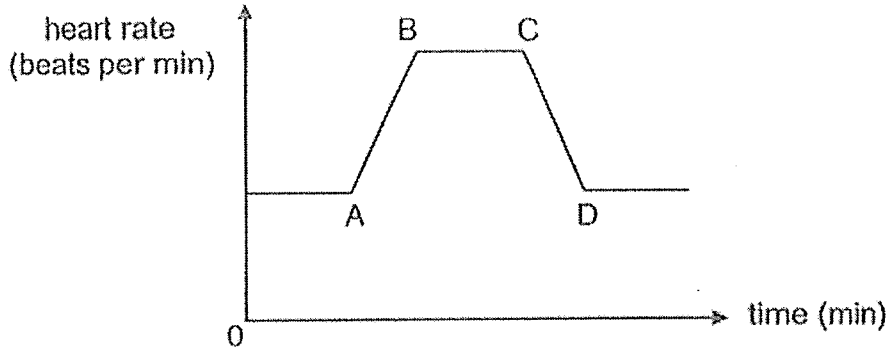
4. Study the cells shown in the diagram below.



Which of the following statements is definitely true?

(1) Cells X, Y and Z are unicellular organisms.
(2) Only cell Y cannot maintain a regular shape.
(3) Only cell X is a plant cell as it has chloroplasts.
(4) Both cells X and Z can make food as they have a cell wall.

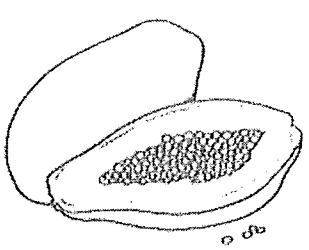
5. The heart rate of a person before, during and after a strenuous activity was measured and recorded in the graph as shown below.



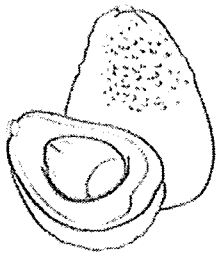
Which of the points A, B, C or D correctly shows when she started and ended the strenuous activity?

	Started strenuous activity	Ended strenuous activity
(1)	A	C
(2)	A	D
(3)	B	C
(4)	B	D

6. The diagram below shows two fruits, a papaya and an avocado.



papaya



avocado

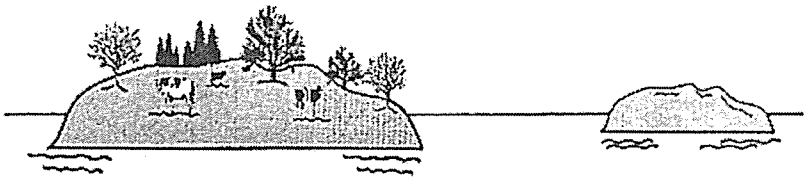
The table below shows the classification of flowers W and X.

One ovule	Many ovules
W	X

Which of the following best represents the flower the fruit may be developed from?

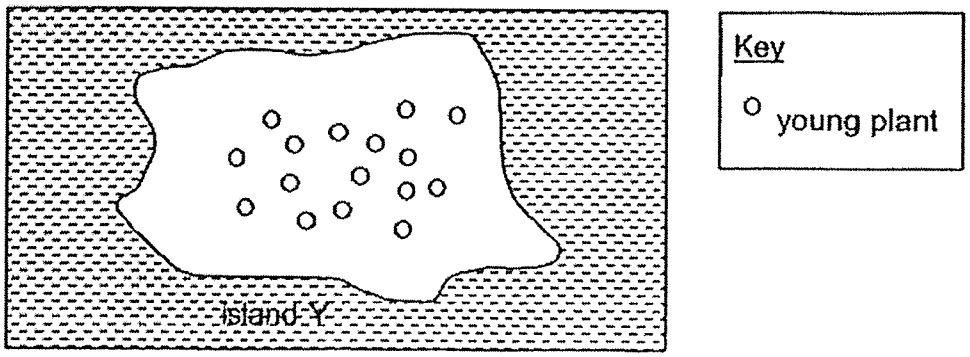
	Papaya fruit	Avocado fruit
(1)	W	W
(2)	W	X
(3)	X	X
(4)	X	W

7. At the beginning, island X had plants and animals, but island Y had no plants and no animals.



island X Island Y

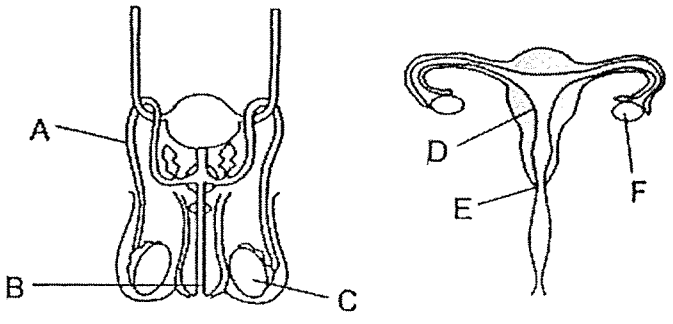
A few years later, island Y started to have plants and the distribution of young plants are shown in the diagram below.



What are the likely fruit dispersal methods of these plants?

(1) wind and water
(2) wind and animal
(3) water and animal
(4) wind, water and animal

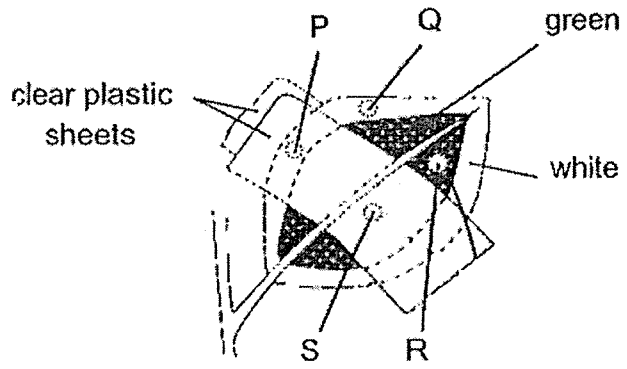
8. The diagram below shows the human male and female reproductive systems.



Which one of the following statements is true?

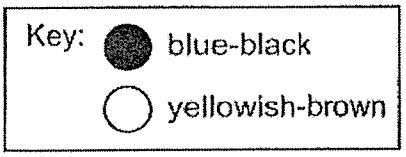
(1) Parts C and F produces the egg cells.
(2) The egg cell travels through part A to part B.
(3) Male reproductive cells are produced at part C.
(4) The male reproductive cells are deposited at part B by part E.

9. A leaf of a plant was covered with clear plastic sheets as shown below and left in a dark room for a day.



The plant was then placed under bright sunlight for six hours. The white portion of the leaf does not contain any chlorophyll. Four discs P, Q, R and S were punched out from the leaf in the positions shown above and a starch test was conducted Iodine solution changes from yellowish-brown to blue-black in the presence of starch.

Which one of the following shows the correct colour change of the iodine solution?



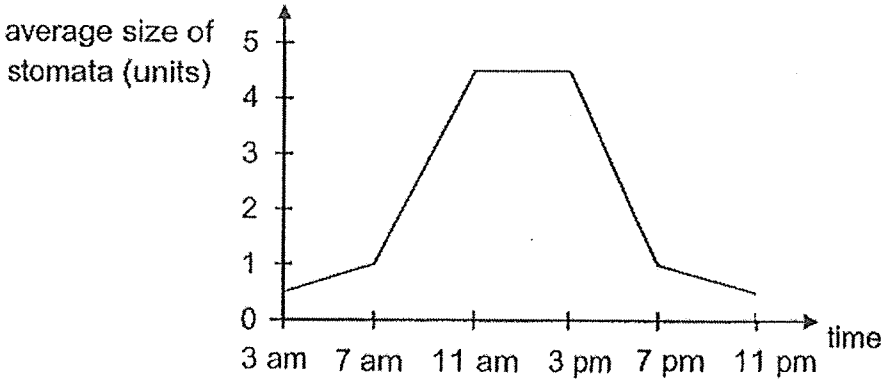
(1)

(2)

(3)

(4)

10. The graph below shows how the average size of the stomata of a plant that was placed in an open field changes at different times of the day. The size of stomata increases when a plant photosynthesises.

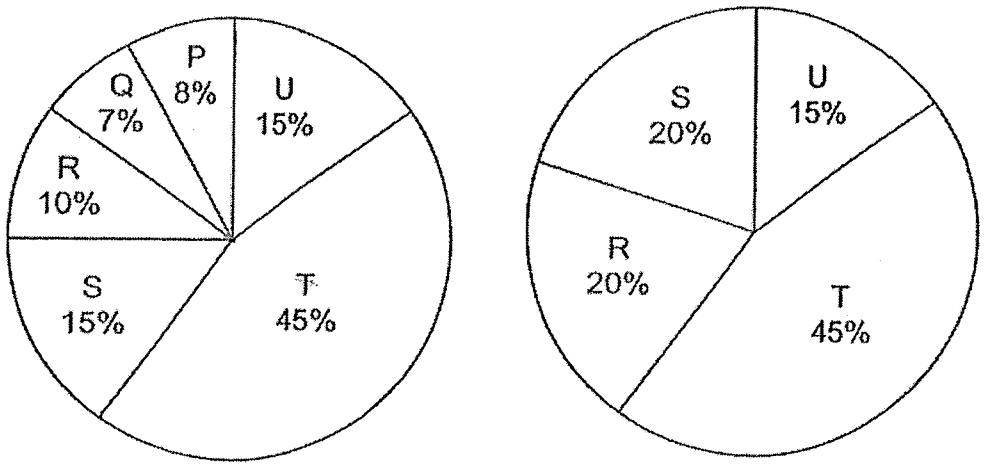


Based on the graph above, which one of the following statement(s) is / are most likely true ?

A No photosynthesis occurred after 11 pm.
B The rate of photosynthesis increased from 3 am to 7 am.
C The rate of photosynthesis decreased the fastest from 7 pm to 11 pm.
D The plant was photosynthesising at its maximum rate from 11 am to 3 pm.

(1) D only
(2) A and C only
(3) B and D only
(4) All of the above

11. The pie charts below show the different populations of organisms found in two different communities K and L.



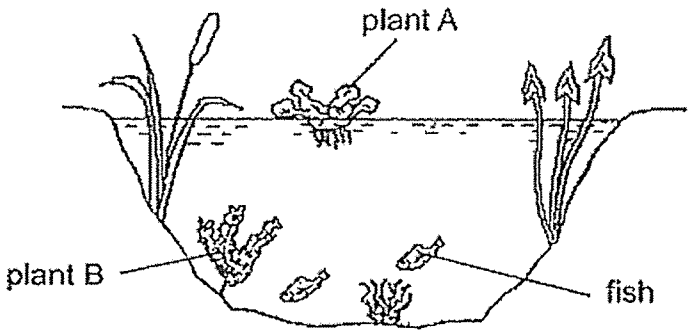
community K community L

Which of the following statement(s) about communities K and L is / are false?

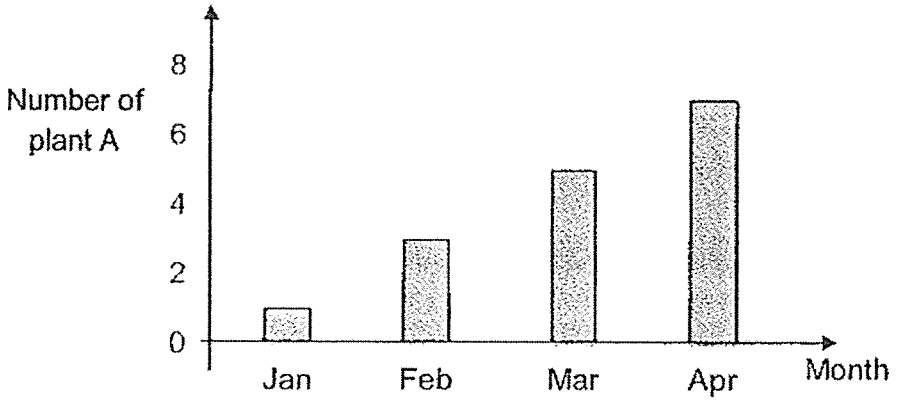
A The number of organism T in both communities are the same.
B The percentage of organism U in both communities are the same.
C There are lesser populations of organisms in community K than in L.
D The total number of organisms in community L is lesser than in community K.

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

12. The diagram below shows a pond.



The graph below shows how the population of plant A changes over a period of time.



Which of the following shows the correct observation and explanation of how the population size of plant B will change over the same period of time?

	Population size of plant B	Reason
(1)	Increase	The fishes ate plant A.
(2)	Increase	Plant B could make more food.
(3)	Decrease	Plant B did not receive enough sunlight.
(4)	Decrease	The temperature of the water decreased.

13. The table below shows the masses of four different materials A, B, C and D, before and after being completely submerged in a container of water for 10 minutes.

Material	Original mass (g)	Mass after 10 minutes (g)
A	31	39
B	25	45
C	80	160
D	55	60

Which of the following shows the correct order of the materials from the least absorbent to the most absorbent?

	Least absorbent ⟶ Most absorbent			
(1)	C	B	A	D
(2)	A	D	B	C
(3)	C	D	B	A
(4)	D	A	B	C

14. Katie followed the steps below to separate three substances that were mixed together.

Step 1: Add water to the mixture of substances and stir it. Only one of the substances dissolved in water.
Step 2: Pour the mixture through a filter paper to separate the undissolved solids from the liquid.
Step 3: A magnet was placed over the mixture of undissolved solids.
Step 4: The liquid was heated in a beaker.

Katie observed that the magnet attracted some of the undissolved solids. She also noted that a white substance remained in the beaker after the water in the liquid has completely evaporated.

Which of the following are possible substances found in the original mixture?

(1) Iron, steel and salt
(2) Steel, plastic and sand
(3) Iron, aluminium and salt
(4) Steel, aluminium and sand

15. Diagram 1 below shows a toy frog W with an iron bar inside it. Diagram 2 shows the cross-section views of two more toy frogs X and Y.

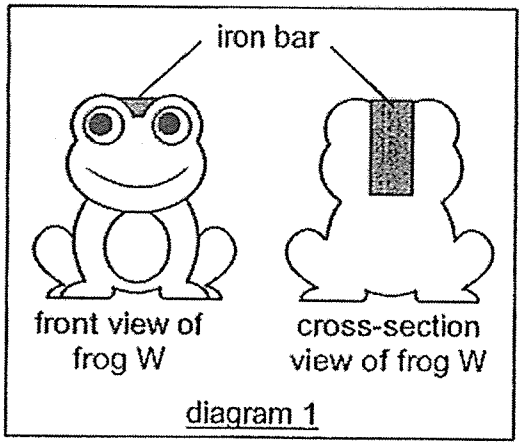


diagram 1

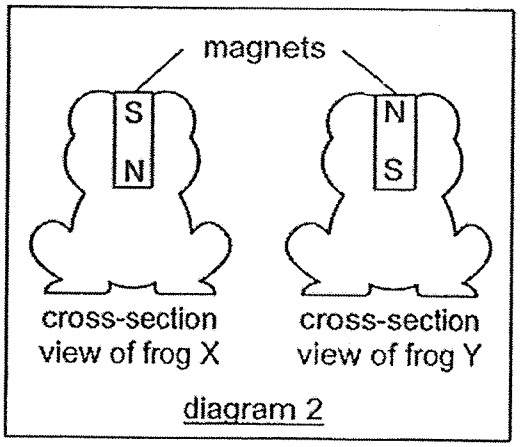
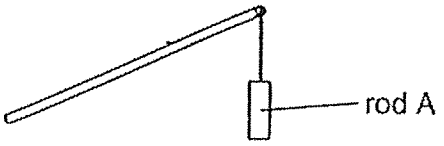
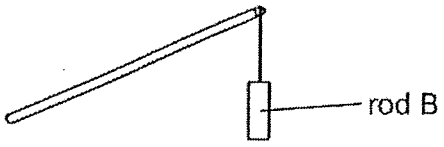


diagram 2

Ravi placed rods A and B above the frogs and recorded his observations in the table below.





	toy frogs picked up
Rod A	X and Y only
Rod B	W and Y only

Which of the following shows what rods A and B could be?

(1)

rod A	**rod B**
S N	N S

(2)

rod A	**rod B**
iron bar	iron bar

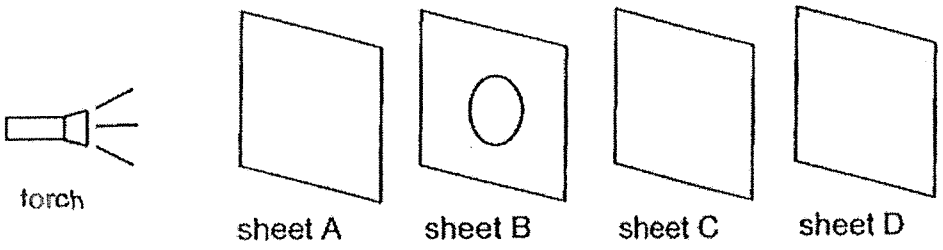
(3)

rod A	rod B
iron bar	S N

(4)

rod A	**rod B**
iron bar	N S

16. The experiment below is carried out in a dark room. Sheets A, B, C and D are arranged in a straight line and there is a circular hole on sheet B. When the torch is switched on, a bright circular patch of light is seen on sheet C only.

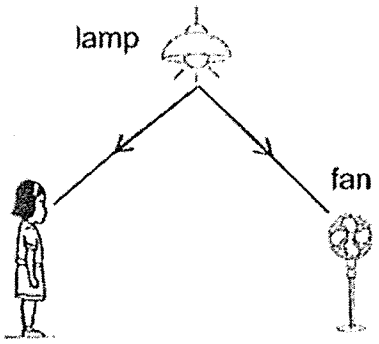


Which of the following correctly describes the properties of the materials A, B, C and D?

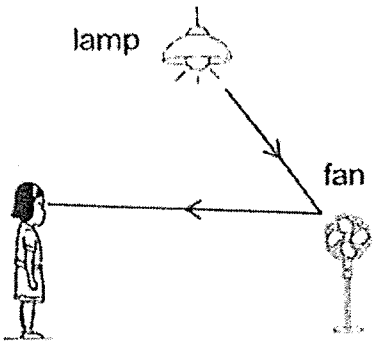
	Allows light to pass through	Does not allow light to pass through	Not possible to tell
(1)	A	C	B and D
(2)	A	B and C	D
(3)	B and C	A	D
(4)	C and D	B	A

17. Which of the following correctly shows the path of light that makes it possible for the girl to see the fan?

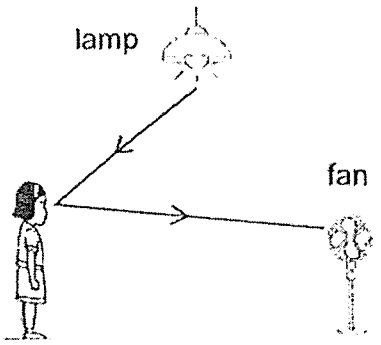
(1)



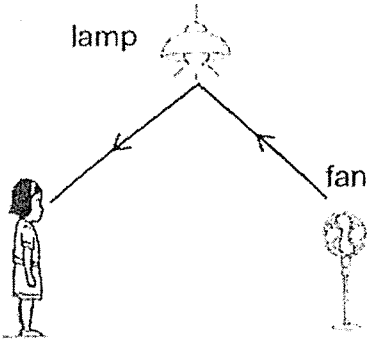
(2)



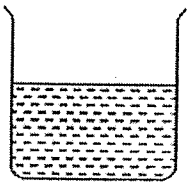
(3)



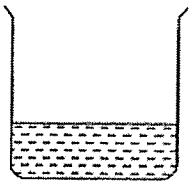
(4)



18. Water at room temperature was poured into two identical beakers P and Q. Both beakers were heated. The temperatures of water in P and Q were recorded every minute until water in both beakers boiled.



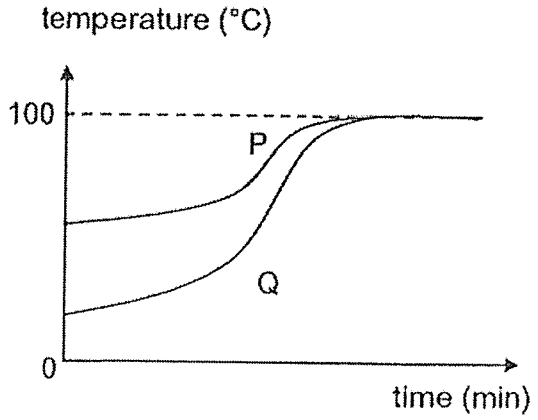
beaker P



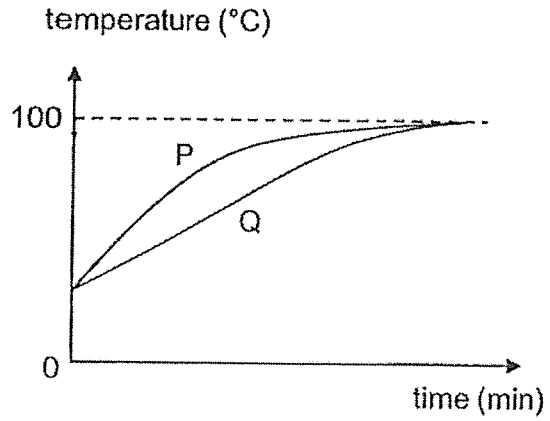
beaker Q

Which of the following shows the correct graph for the above observation?

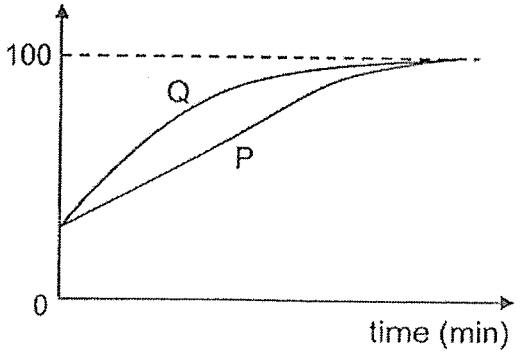
(1)



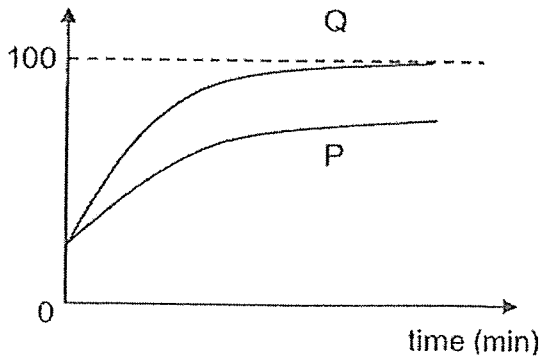
(2)



(3)



(4)



19. Which of the following about heat is true?

(1) Heat is a matter.
(2) Heat is a form of energy.
(3) Heat travels from cold to hot objects.
(4) Heat can be measured using a thermometer.

20. More air was pumped into a fully inflated rubber ball.

Which of the following shows the correct observation about the mass and volume of the rubber ball?

	Mass	Volume
(1)	increase	increase
(2)	increase	remains the same
(3)	remains the same	increase
(4)	remains the same	remains the same

21. The table below shows the properties of P, Q, R and S. A tick (✓) shows that the property is present.

Property	P	Q	R	S
Has mass	✓	✓	✓	
Has a definite shape	✓		✓	
Has a definite volume			✓	

Which of the following best represents plasticine and shadow?

	Plasticine	Shadow
(1)	Q	P
(2)	Q	S
(3)	R	P
(4)	R	S

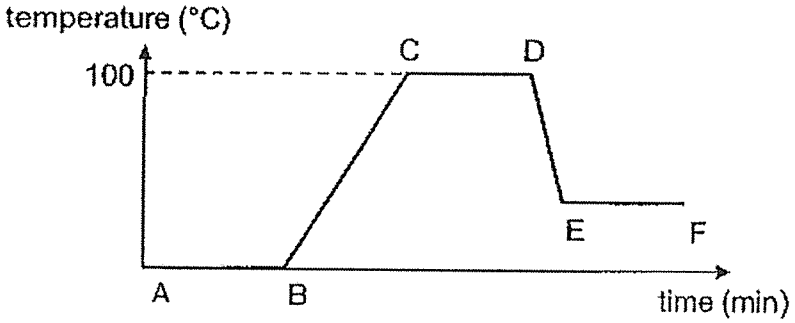
22. The table below shows the melting and boiling points of substances X and Y.

Substance	X	Y
Melting point (°C)	160	120
Boiling point (°C)	430	300

At which temperature are substances X and Y in the same state of matter?

(1) 140 °C
(2) 170 °C
(3) 380 °C
(4) 420 °C

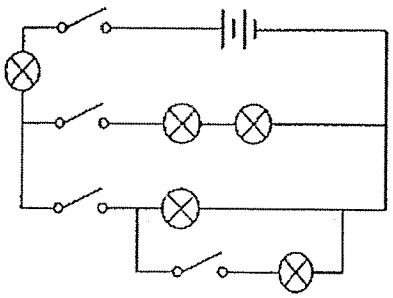
23. The graph below shows the temperature changes in a beaker of ice over time.



Based on the graph, which of the following statements is true?

(1) Water started to boil at D.
(2) Heat source was removed at C.
(3) There is no heat gain in AB and CD.
(4) Water reached room temperature at E.

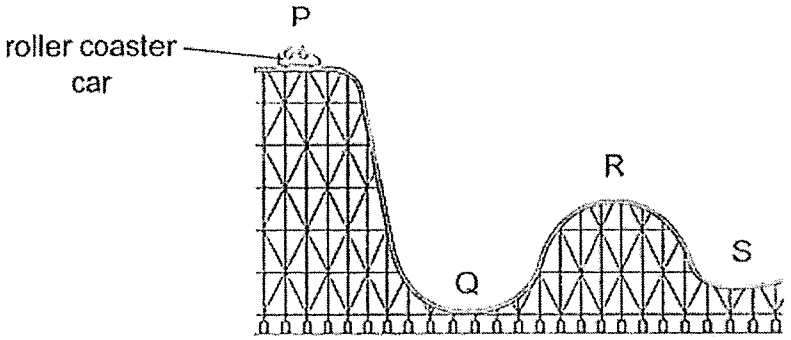
24. The circuit below consists of identical bulbs and batteries in good working condition.



What is the least number of switches to be closed in order for three bulbs to be lit at the same time ?

(1) 1
(2) 2
(3) 3
(4) 4

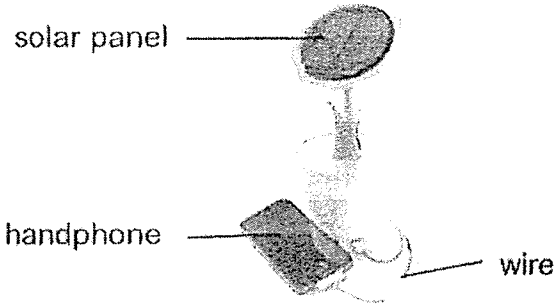
25. The diagram below shows a roller coaster in an amusement park.



At which point P, Q, R or S does the roller coaster car have the highest kinetic energy as it moves from P to S?

(1) P
(2) Q
(3) R
(4) S

26. The diagram below shows a handphone connected to a phone charger.



Which of the following shows the main energy conversion for the handphone to work?

(1) Heat energy → Electrical energy → Light energy + Sound energy

(2) Light energy → Electrical energy → Heat energy + Light energy + Sound energy

(3) Heat energy → Electrical energy → Heat energy + Light energy + Sound energy

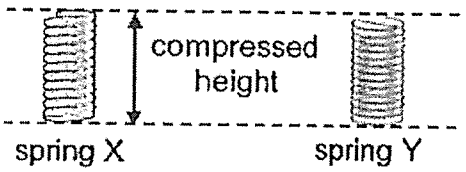
(4) Light energy → Electrical energy → Light energy + Sound energy

27. Which of the following shows the effects of a force?

A A girl sitting on a chair.
B A beaker of water gaining heat.
C A man moulding a piece of clay.
D A tennis ball changing direction after being hit.

(1) A and B only
(2) C and D only
(3) A, C and D only
(4) All of the above

28. Lydia compressed two springs X and Y of the same length to the same height as shown below. Spring X is stiffer than spring Y.



Which of the statements below is true?

(1) Both springs X and Y will exert the same amount of elastic spring force.
(2) When released, spring X will exert a greater elastic spring force than spring Y.
(3) When released, more elastic potential energy will be converted to more kinetic energy in spring Y.
(4) Same amount of chemical potential energy is needed to compress both springs to the same height.

~ End of Booklet A ~

CHIJ ST NICHOLAS GIRLS' SCHOOL

Primary 6
Mid-Year Assessment

SCIENCE

BOOKLET B

12 May 2022

Booklet A	
Booklet B	
Total	

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

12 questions
44 marks

Do not open this booklet until you are told to do so.
Follow all instructions carefully.
Answer all questions.

This paper consists of 15 printed pages.

Parent's Signature/Date

Section B (44 marks)

For questions 29 to 40, write your answers in this booklet.

The number of marks available is shown in the brackets at the end of each question or part question.

29. Gerald wanted to find out how the breathing rate during different activities is affected by the mass of a person. He invited three friends for the experiment and ensured that each of them took a five-minute break before taking part in the next activity. He recorded the results in the table below.

	Breathing rate (breaths per min)		
Activity	Friend X (70 kg)	Friend Y (80 kg)	Friend Z (90 kg)
Sitting	14	20	25
Walking	25	30	42
Running	40	48	59

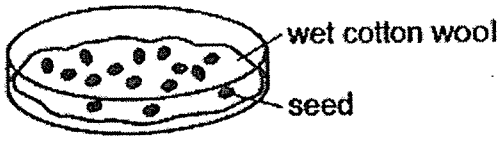
(a) Explain why their breathing rates were the highest when they were running. [1]

(b) Why did each person take a five-minute break between each activity? [1]

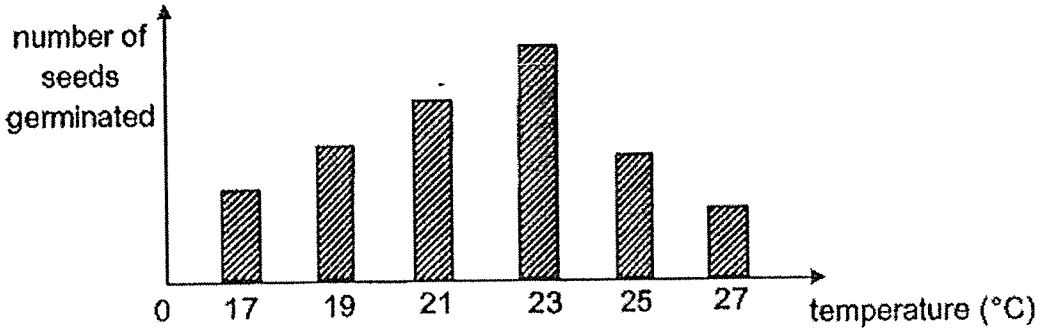
(c) Based on the results, what can Gerald conclude from the experiment? [1]

30. (a) Which factors are needed for germination? [1]

Tricia wanted to find out if germination of seeds of plant G is affected by the surrounding temperature. She placed six dishes with 15 seeds in each dish in six different boxes. The boxes were maintained at different temperatures.



The graph below shows the number of seeds that have germinated after 3 days.

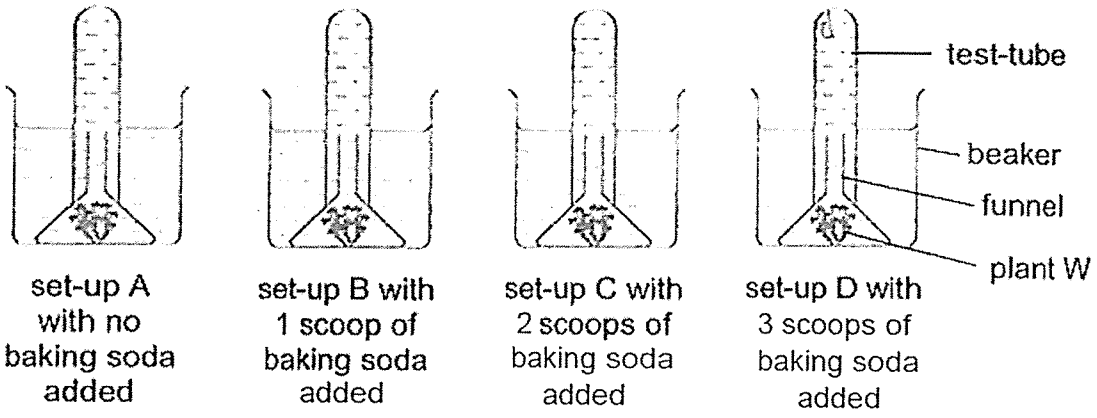


(b) List one other condition that should be kept constant. [1]

(c) Based on the graph, what is the relationship between temperature and the number of seeds that have germinated? [2]

(d) Tricia wanted to conduct another experiment to find out if the amount of space provided affects the growth of young plants. List two changes to be made to the above experiment. [1]

31. Bertha set up the following experiments in her classroom as shown below. She measured the rate of photosynthesis by counting the number of bubbles produced by water plant W in each set-up for 10 minutes. Baking soda reacts with water to produce carbon dioxide.



set-up A with no baking soda added

set-up B with 1 scoop of baking soda added

set-up C with 2 scoops of baking soda added

set-up D with 3 scoops of baking soda added

(a) State a possible hypothesis for Bertha's experiment. [1]

(b) What is the purpose of set-up A? [1]

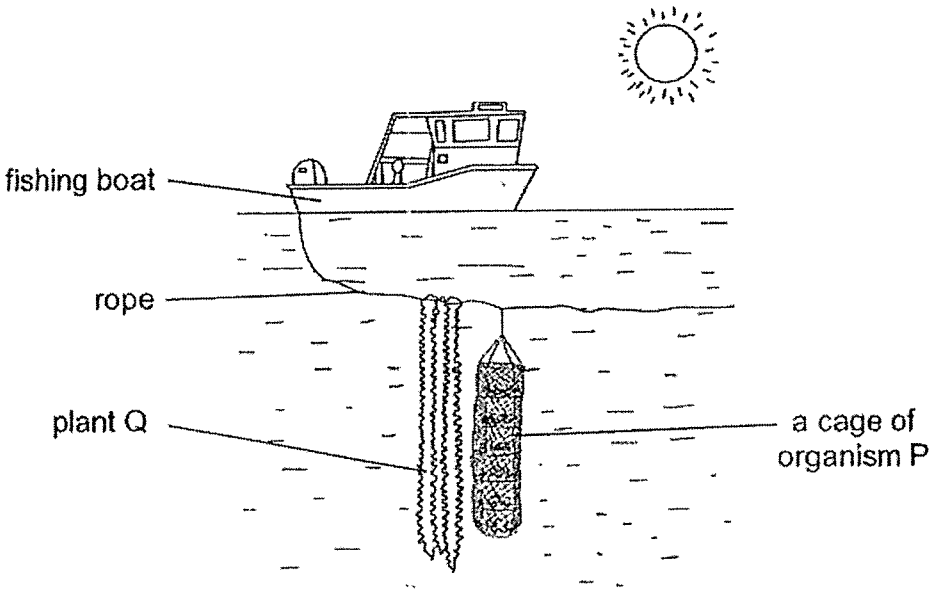
(c) The table below shows the results of Bertha's experiment.

Set-up	Number of bubbles produced in 10 minutes
A	10
B	22
C	35
D	47

Organism P shown below grows poorly in waters with high levels of carbon dioxide.

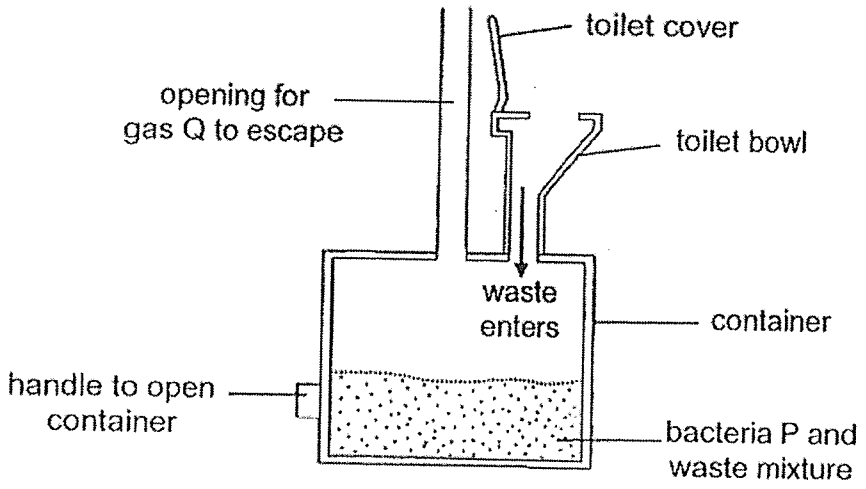
organism P

To help organism P grow well, fishermen usually grow some plant Q next to a cage of P as shown below.



Based on Bertha's experiment, explain how plant Q is able to help organism P grow well in waters with high levels of carbon dioxide.

32. Study the diagram below. Human waste drops into the container containing bacteria P. After some time, process X occurs and a soil-like substance is produced. Gas Q is produced during process X.



(a) Describe the role of bacteria P in process X. [1]

(b) State what is gas Q. [1]

(c) Other than the presence of water and air, state another environmental factor that will affect the speed of process X. [1]

(d) The soil-like substance can be used as fertilisers for the plants.

Why is it important to the environment to use the soil-like substance as fertilisers for plants? [1]

33. Ali held two toy trucks 10 cm away from each other as shown in diagram 1 below. When he released the two trucks, they moved away from each other.

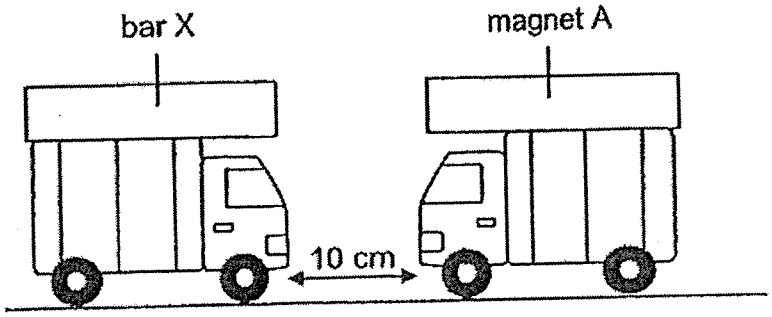


diagram 1

(a) State the force that caused the observation in diagram 1 above. [1]

(b) Without making any changes to the objects used above, suggest a way to make the trucks move away from each other faster. [1]

(c) Ali replaced bar X with bar P and repeated the experiment. He noted that the trucks moved towards each other as shown in diagram 2.

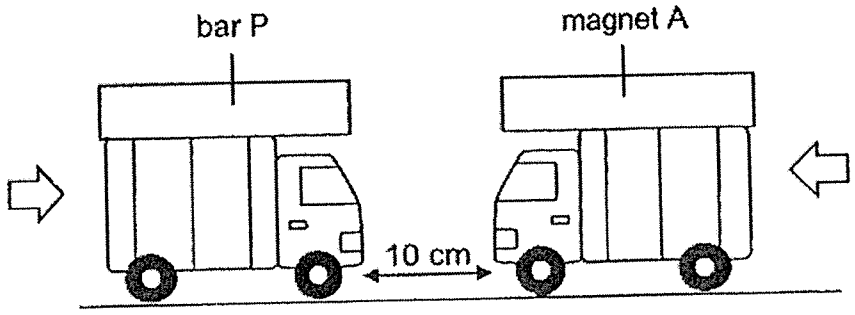
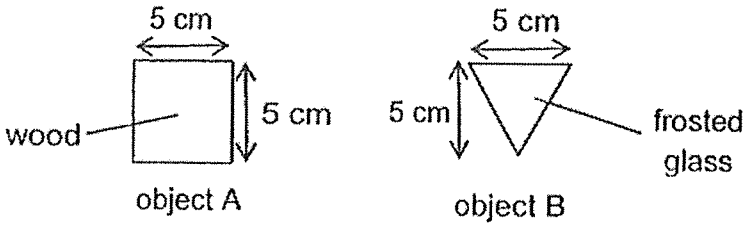


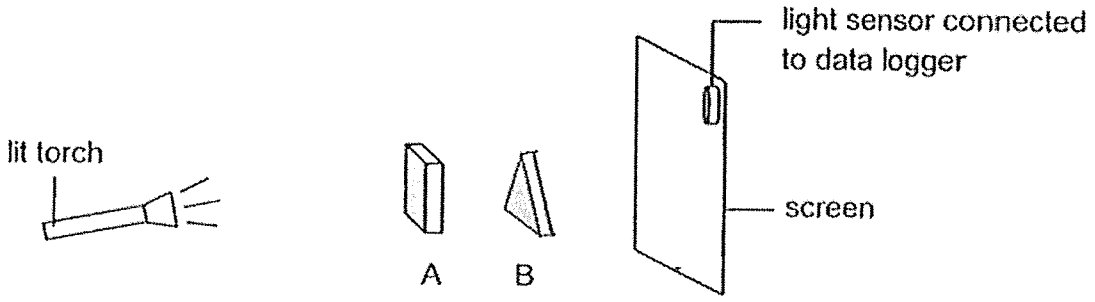
diagram 2

He concluded that bars X and P are both magnets. Do you agree with him? Explain your answer. [2]

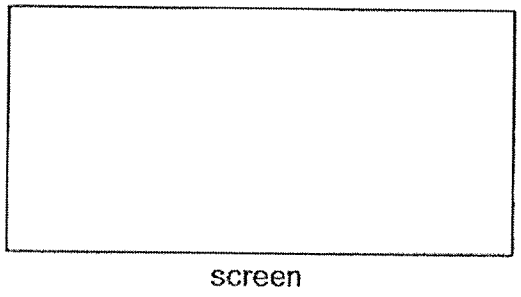
34. The diagram below shows objects A and B made of wood and frosted glass respectively.



Objects A and B were used in the experiment shown below.



(a) A shadow was cast on the screen. Draw the shadow in the box below. [1]



(b) State a property of light that enables shadows to be formed. [1]

_____

_____

(c) A change was made to the experiment. It was observed that the shadow became smaller although the reading on the light sensor remained the same. What was the change? [1]

_____

_____

35. Ben filled a beaker with 20 cm^3 of marbles as shown in diagram 1. He added 20 cm^3 of water and predicted that the final water level will be as shown in diagram 2.

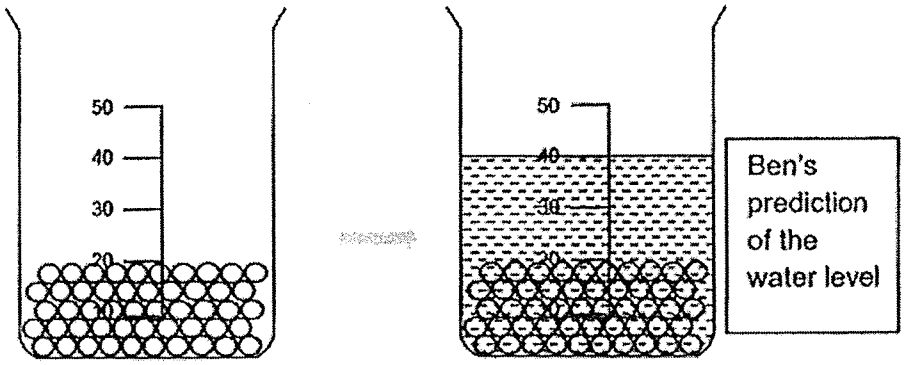
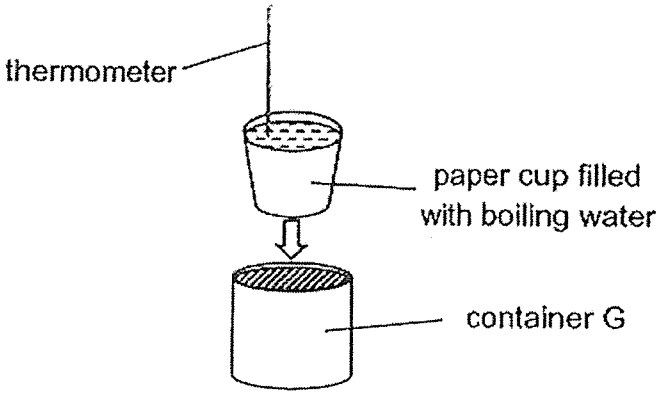


diagram 1 diagram 2

(a) Do you think his prediction is correct? Explain your answer. [2]

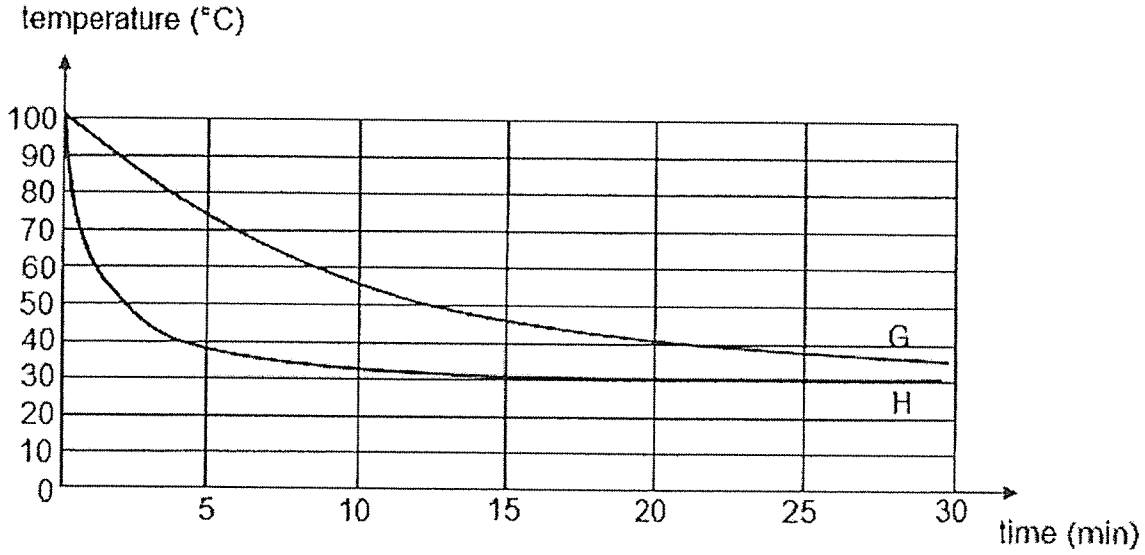
(b) State a property of water that supports your answer in (a). [1]

36. Albert wanted to find out which container helps to keep water hot for a longer time. He placed a paper cup filled to the brim with boiling water into container G as shown below.



He repeated the experiment with a similar container H made of a different material.

He conducted the experiment in a room and recorded the results in the graph shown below.



(a) Why should the size of the paper cup be kept the same? [1]

_____

_____

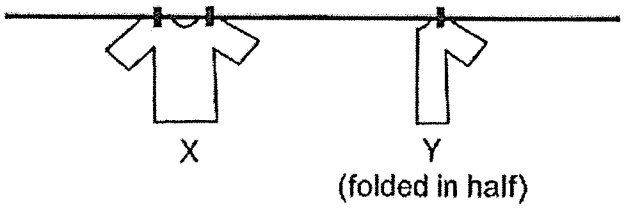
(b) Which container is able to keep water hot for a longer time? Explain your answer. [2]

_____

_____

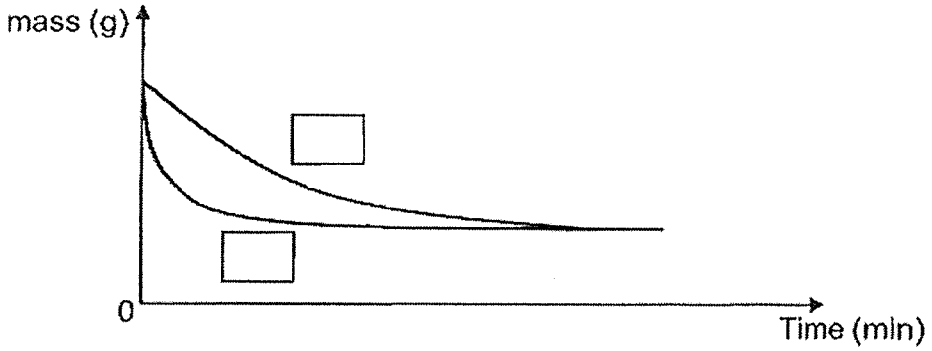
(c) Based on the graph, what is the temperature of the room? [1]

37. Martha wanted to investigate if a certain factor affects the time taken for t-shirts to dry. She washed and hung two identical t-shirts X and Y to dry as shown below.



(a) Name and describe the process that allows the t-shirts to dry. [1]

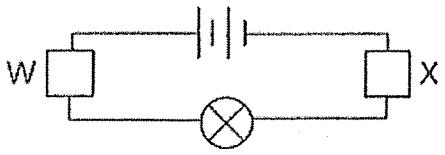
She measured the mass of each shirt every thirty-minute and plotted the results as show in the graph below.



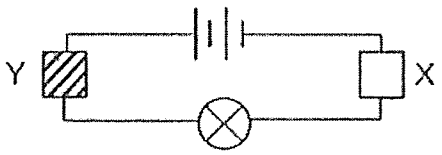
(b) Complete the graph above by labelling X or Y in the boxes provided. [1]

(c) Explain your answer in (b). [2]

38. Three materials W, X and Y were used to set up two circuits A and B as shown below.



circuit A

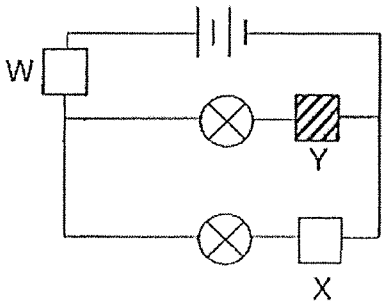


circuit B

The two circuits were tested and the results are shown in the table below.

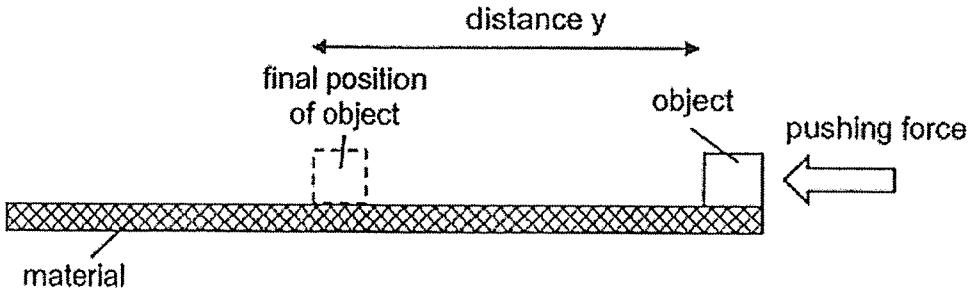
Circuit	Does the bulb light up?
A	no
B	yes

Another circuit C was constructed using materials W, X and Y as shown below.



How many bulbs would light up? Explain your answer. [2]

39. Paul conducted an experiment to find out if the distance moved by an object would be affected by the type of material the object was moving on. For each material used, he gave the object a push with the same amount of force.



The table below shows his results.

Material	Distance *y* (cm)			
	1st try	2nd try	3rd try	Average
E	10.1	10.3	10.2	10.2
F	13.5	13.6	13.2	13.4
G	5.2	5.1	5.3	5.2

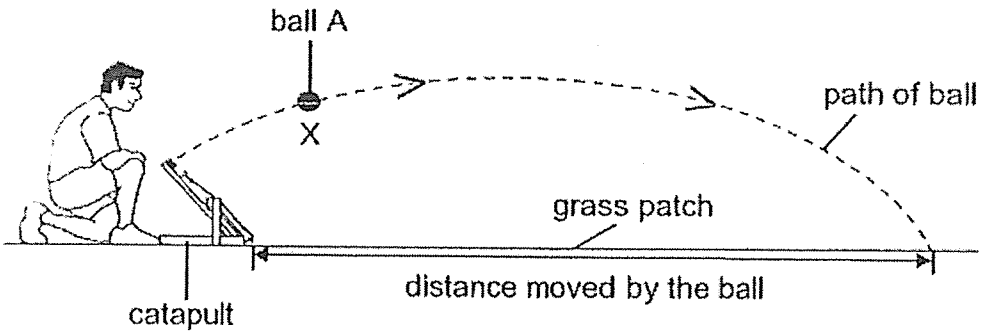
(a) What is frictional force? [1]

(b) Based on his results, which material, E, F or G, should he use to cover the floor if he wanted to prevent falls? Give a reason for your answer. [2]

(c) Beside frictional force, name one other force acting on the object as it was moving. [1]

(d) Why did Paul repeat his experiments 3 times for each material? [1]

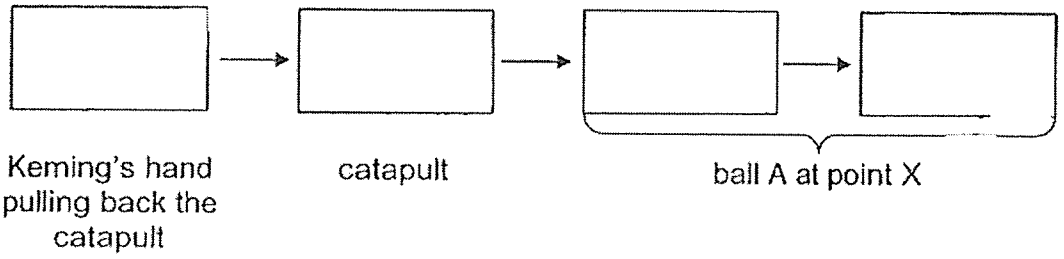
40. Keming carried out an experiment using a catapult. He pulled back the catapult with ball A downwards before releasing it, causing the ball to be launched into the air. Ball A then travelled some distance before falling onto the grass patch.



He measured the distance moved by ball A and recorded his results in his notebook as shown below. He repeated his experiment two more times.

Ball A (15g)
1st try: 353 cm
2nd try: 356 cm
3rd try: 347 cm

(a) State the main energy conversion that has occurred for ball A to reach point X. [1]



(b) Give a reason why the distance moved by ball A was different for each try. [1]

_____

_____

(c) Keming repeated the experiment with another ball B of a different mass. His results for ball B are shown below.

Ball B (30g)
1st try: 174 cm
2nd try: 179 cm
3rd try: 177 cm

What is the aim of Keming's experiment? [1]

(d) Keming's father suggested that he should conduct his experiment on a sand pit instead of a grass patch.

Do you agree with him? Explain your answer. [1]

~ End of Booklet B ~

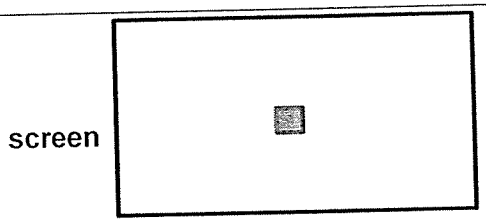
SCHOOL : St Nicholas
LEVEL : P6
SUBJECT : Science
TERM : 2022 P6

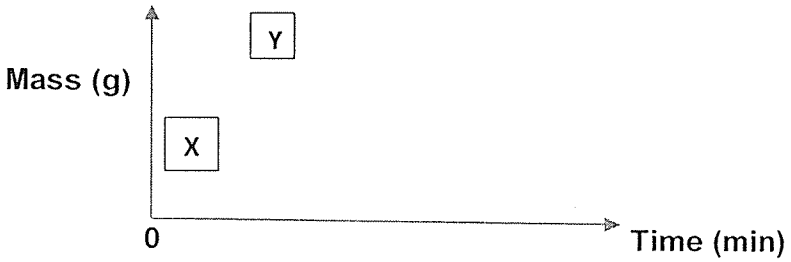
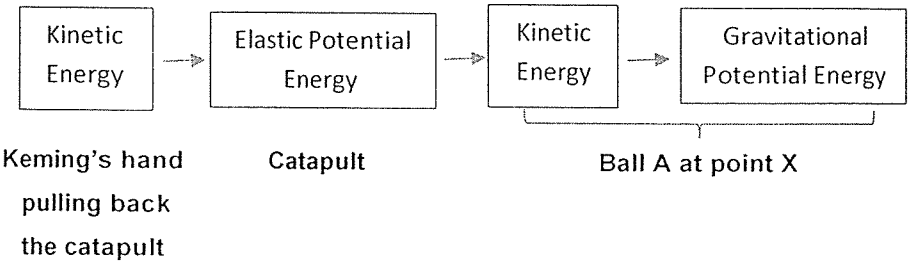
SECTION A

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

SECTION B

Q29)	a) Running was the most vigorous activity so their body needs most energy. They breathe fastest to take in most oxygen and give out/remove most carbon dioxide for most respiration. b) To allow it each persons breathing rate to return to his/her normal breathing rate at rest. c) The greater the mass or the person, the higher the breathing rate during different activity.
Q30)	a) Water , Oxygen and Warmth b) The amount of water given to each dish of seeds c) The higher the temperature up until 23'C, the greater the number of seeds germinated after 23'C, the higher the temperature, the smallest / lesser the number of seeds that germinated. d) Keep the temperature of each set up the same. Change the size of each dish / change the number of seeds in each dish.

Q31)	a) The greater the amount of carbon dioxide, the higher the rate of greater the number of bubbles produced. b) Set up an act as a control set up to show that any changes in the number of bubbles produced by wissoley due to the number if scoops of baking soda added. c) Plant Q would be able to photosynthesize roster in waters with high levels of carbon dioxide, this reduces the amount of carbon dioxide in the water.
Q32)	a) Bacteria P is a decomposer that breaks down the human waste/waste materials into simple substances. b) Carbon dioxide. c) Temperature/amount of warmth. d) To replace nutrients/minerals that have been used up / to give or provide additional nutrients to plants.
Q33)	a) Magnetic force of repulsion. b) Push the two trucks closer to each other. c) No. Only box X is a magnet as it has the like poles or both X and A are facing each other directly. Bar P could also be a magnetic object.
Q34)	a)  b) Lightwave is in a straight line. c) Both A and B were moved closer to the screen.
Q35)	a) No. There are air spaces between the marbles. So water could enter to occupy the air space previously occupied by the escaped air. b) Water does not have a definite shape.
Q36)	a) To ensure that the amount/volume of water used is the same and to ensure that the test is fair so that there is only one changed variable which is the materials/type of container.

	b) G, as the temperature or water in G decreased slower so G is a poorer heat conductor which allows the water to lose heat slower to the surroundings. c) 30°C
Q37)	a) Evaporation. Water in the T-shirts gained heat from the surrounding air and becomes water vapour. (at any temperature) b)  c) X has a greater exposed surface area to the surrounding air, so water in shirt X gains heat faster from warmer surrounding air and evaporates faster (to become water vapor) leaving shirt X drier faster.
Q38)	Zero. W is an electrical insulator so there will be an open circuit so electricity cannot flow through the circuit.
Q39)	a) Frictional force is a type of force that opposes motion. b) G, as the object moved the shortest distance along with G, which shows the greatest/most frictional force between the object and G. Thus, G is the most suitable to cover the floor as it would be the least slippery, hence preventing the person from slipping/falling. c) Gravitational Force. d) To make the result (not experiment) more reliable.
Q40)	a) 

	b) The force exerted on the ball/catapult for each try was different. The amount of wind was not constant for each try. c) To find out if the mass of the ball affects the distance moved by the ball. d) Yes. Conducting the experiment on a sand pit allows the ball to leave a more obvious mark/dent/depression when it lands so that the measurement of the distance moved by the ball can be more accurately measured.
	END OF PAPER