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**PEI CHUN PUBLIC SCHOOL**

**PRIMARY 6**

**PRELIMINARY EXAMINATION 2024**

**SCIENCE**

**(BOOKLET A)**

**Additional Materials: Optical Answer Sheet (OAS)**

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

Name: \_\_\_\_\_ (     )

Class: Primary 6 / (     ) \_\_\_\_\_

Date: 16 August 2024

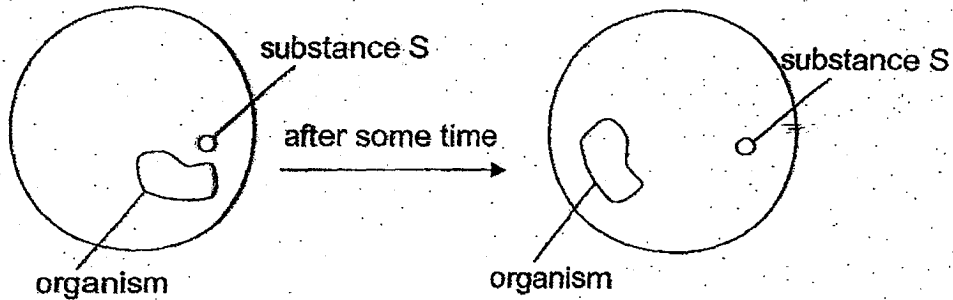
Science Teacher: \_\_\_\_\_



**Section A (28 × 2 marks)**

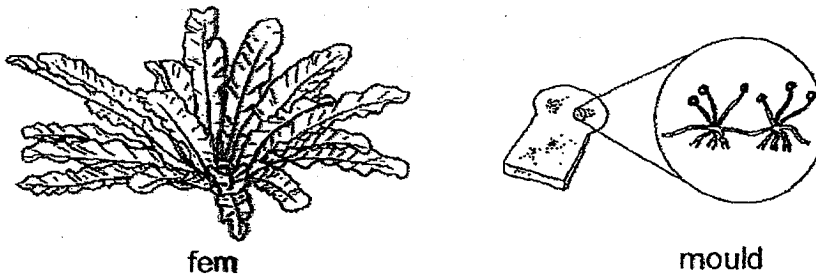
For questions 1 to 28, choose the most suitable answer and shade its number (1, 2, 3 or 4) on the Optical Answer Sheet (OAS) provided.

- 1 Selvi observed a living organism under a microscope.



Based on Selvi's observation, which is the correct conclusion?

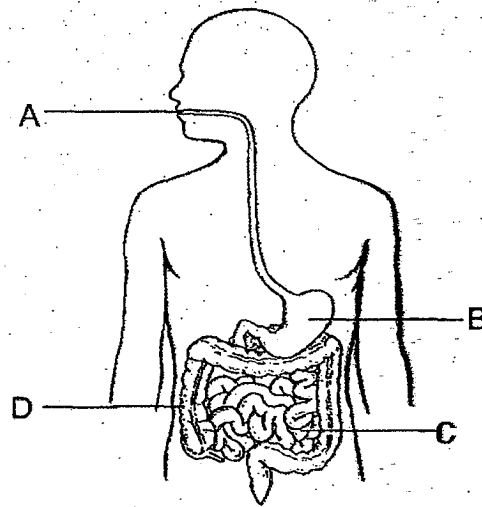
- (1) Living things grow.
  - (2) Living things respond.
  - (3) Living things need food.
  - (4) Living things reproduce.
- 2 The diagram below shows two living things.



What do the two living things have in common?

- (1) They are fungi.
- (2) They reproduce by spores.
- (3) They can make their own food.
- (4) They feed on things which may be dead or alive.

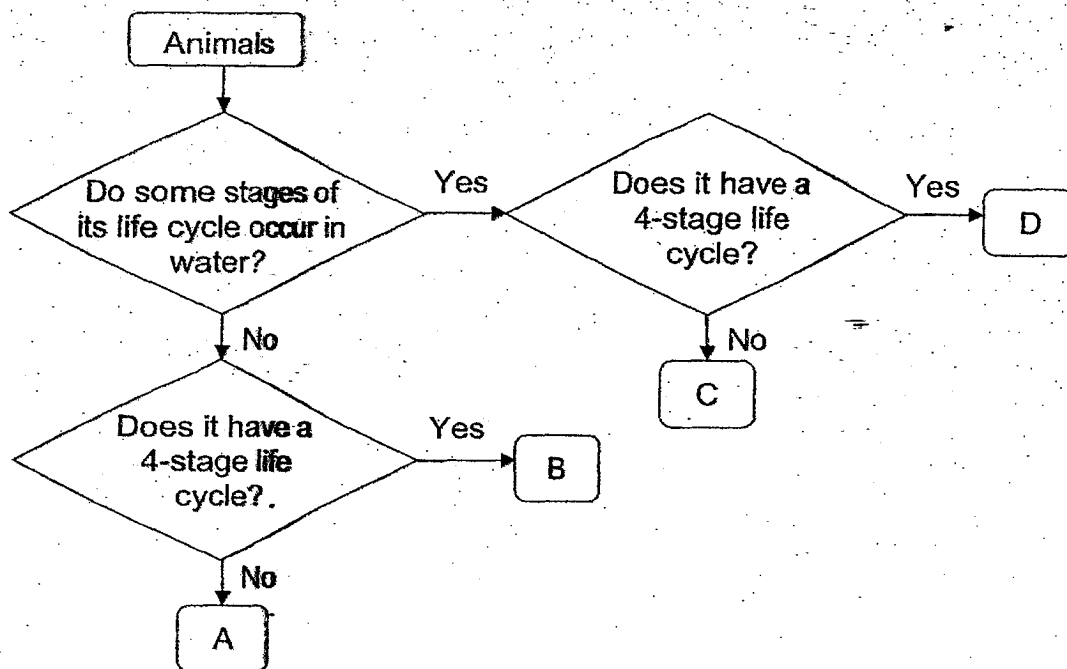
3 The diagram shows parts A, B, C and D, of the human digestive system.



Which of the following statements is correct?

- (1) Digestive juice is added to the food in A.
- (2) Digestion of food is completed in B.
- (3) Water is removed from the undigested food in C.
- (4) Digested food passes through the walls of D into the blood.

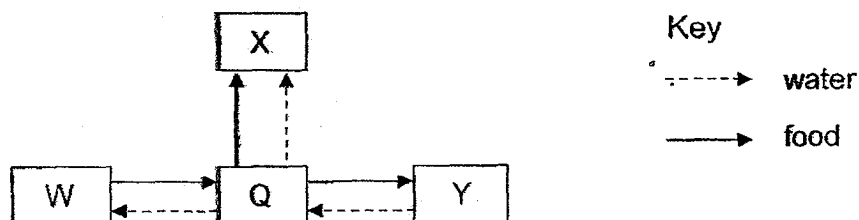
- 4 The flowchart below shows the characteristics of some animals.



Which letters represent the mosquito and chicken?

	Mosquito	Chicken
(1)	B	C
(2)	C	A
(3)	D	A
(4)	D	B

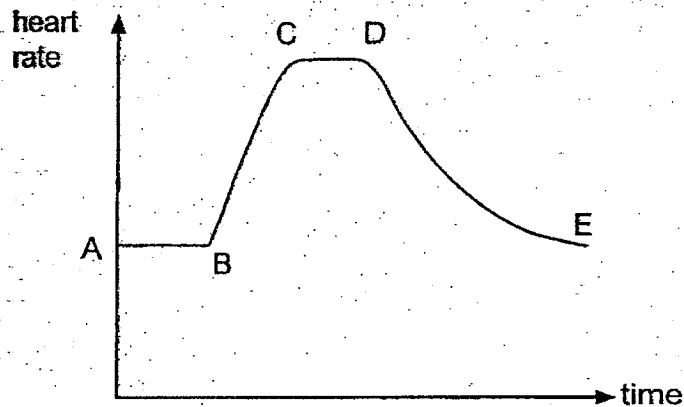
- 5 The diagram shows how water and food flow through different parts, W, X, Y and Q, of a plant.



What do W, X and Y represent?

	W	X	Y
(1)	leaf	fruit	root
(2)	leaf	root	fruit
(3)	root	stem	leaf
(4)	fruit	leaf	root

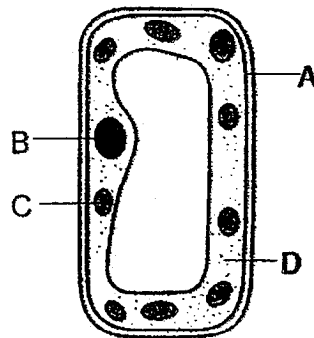
- 6 The graph below shows the changes in Jane's heart rate. She exercised and then stopped after some time.



At which points, did Jane start and stop exercising?

	Start exercising	Stop exercising
(1)	A	D
(2)	B	D
(3)	B	E
(4)	C	E

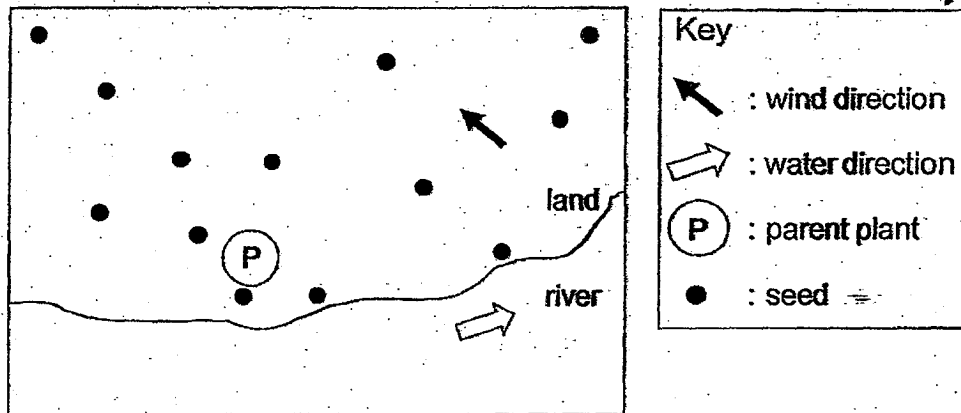
- 7 The diagram below shows a cell.



Which of the following correctly matches the part of the cell to its function?

	Cell part	Function
(1)	A	supports and gives the cell its shape
(2)	B	controls the activities that take place in the cell
(3)	C	jelly-like substance where cell activities take place
(4)	D	controls the substances that enter or leave the cell

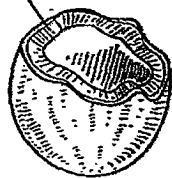
8 The diagram below shows the distribution of seeds of plant P.



Which of the following fruits is most likely to be from plant P?

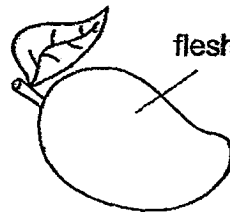
(1)

fibrous husk



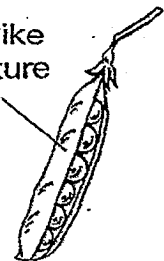
(2)

fleshy



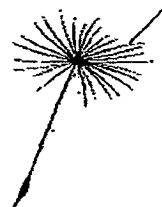
(3)

pod-like structure



(4)

soft hair

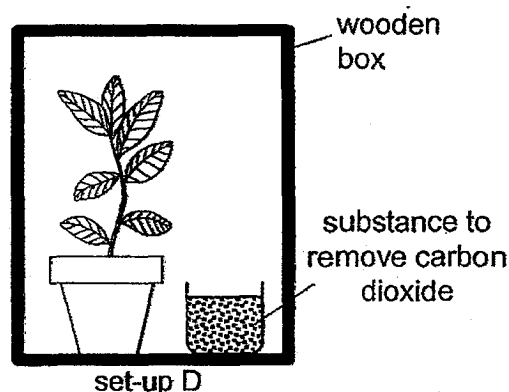
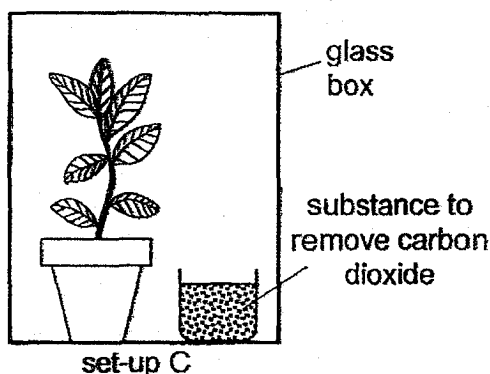
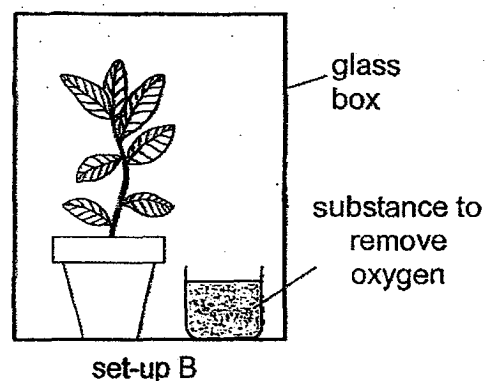
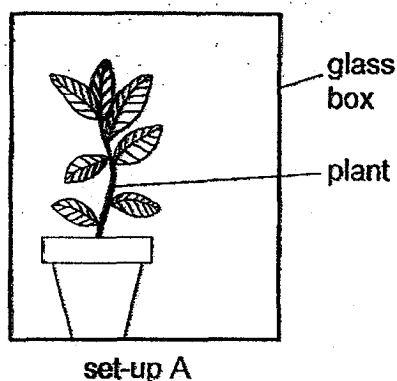


- 9 Which of the following conditions is/ are necessary for seed germination to occur?

	Presence of light	Presence of carbon dioxide	Presence of oxygen
(1)	✓	✓	x
(2)	✓	x	✓
(3)	x	✓	x
(4)	x	x	✓

Key  
 ✓ : yes  
 x : no

- 10 Sarah wanted to find out if carbon dioxide is needed for photosynthesis. She prepared four set-ups, A, B, C and D, using similar plants as shown below.

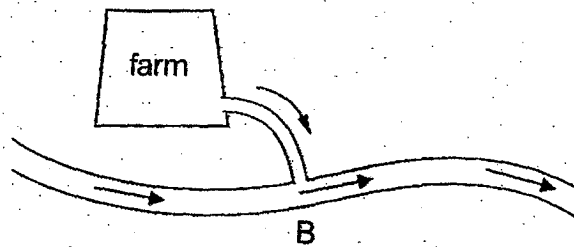


Which **two** set-ups should Sarah use to conduct her experiment?

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

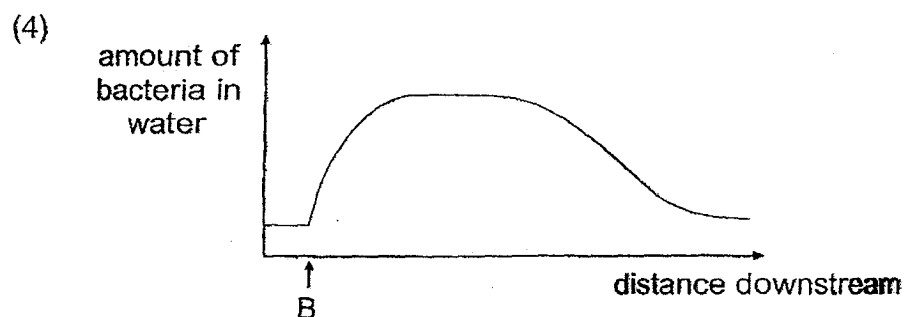
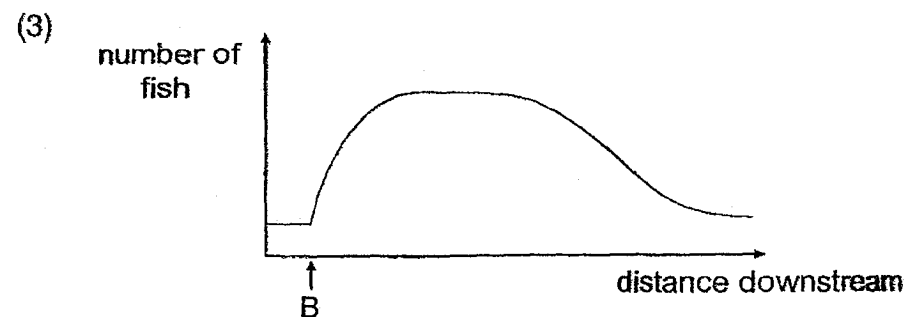
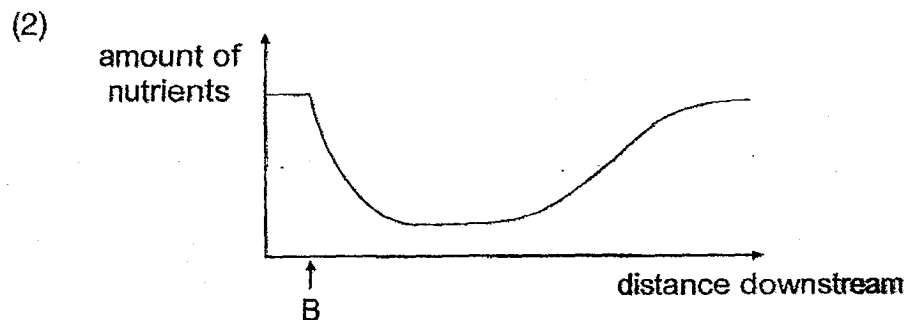
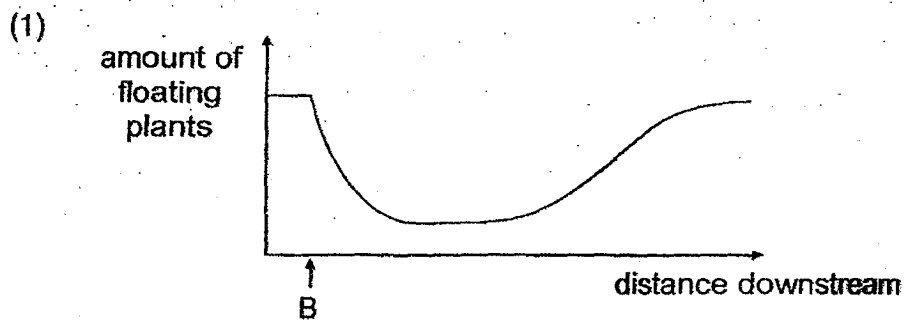


- 11 The diagram below shows the position of a farm near a river. A large amount of fertiliser from the farm flows into the river at point B. The arrow shows the direction in which the river flows.



After some time, plants living deep in the river after point B died.

Which graph best represents the effect of the fertiliser entering the river at B?



- 12 Study the food chain shown below.

$K \rightarrow L \rightarrow M$

Which of the following about the food chain is correct?

	Prey(s)	Predator(s)	Amount of energy as it passes through the food chain
(1)	L	M	increases
(2)	L	M	decreases
(3)	K and L	L and M	increases
(4)	K and L	L and M	decreases

- 13 Some birds feed on small preys like the mouse below.



Which of the following birds has a beak that is best suited for hunting a mouse?

(1)



(2)



(3)



(4)



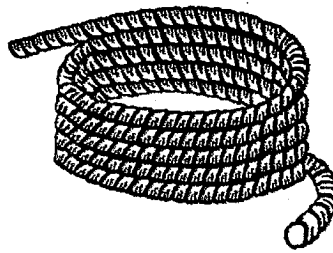
- 14 A scientist observed that the temperature of the air on Earth has increased over the last ten years.

Which of the following activities contribute to global warming?

- A cutting down trees
- B using a fan instead of an air conditioner
- C increasing the number of cars on the road
- D switching off electrical appliances when not in use

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

- 15 The diagram below shows a coil of rope.

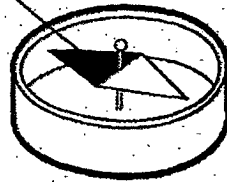


Which property of the rope allows it to be rolled up?

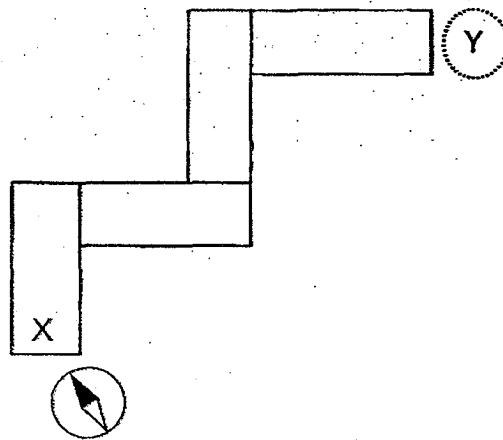
- (1) It is hard.
- (2) It is strong.
- (3) It is flexible.
- (4) It is absorbent.

- 16 A compass has a small magnet that can rotate freely as shown below.

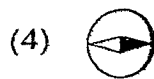
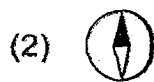
north pole of  
small magnet



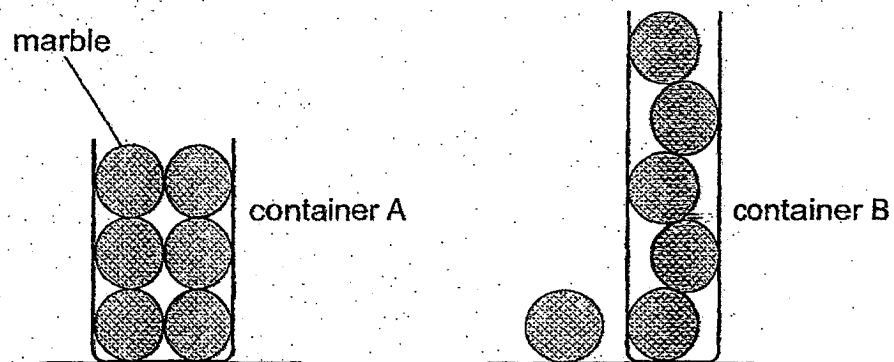
Four bar magnets were arranged such that they were attracted to one another. A compass was then placed near end X and the direction of the compass needle is as shown below.



What would be the direction of the needle when the compass was placed at Y?

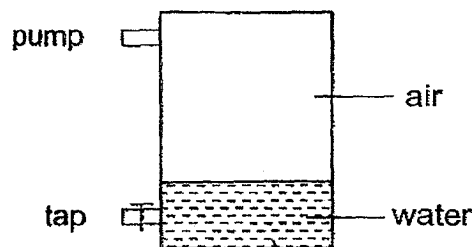


- 17 Glen has two glass containers, A and B, of the same capacity. He placed six identical marbles into container A as shown below. When he poured the marbles into container B, he observed that not all the marbles could fit into it.



Which of the following best explains why six marbles could fit into container A but not into container B?

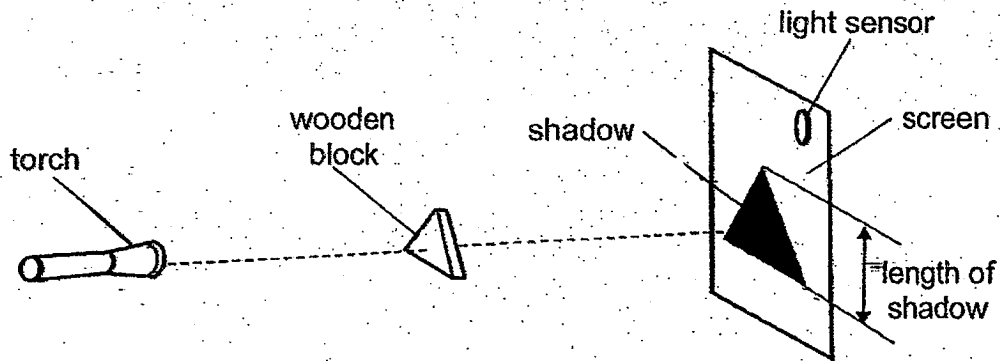
- (1) Marbles have mass.
  - (2) Marbles occupy space.
  - (3) Marbles have a definite shape.
  - (4) Marbles cannot be compressed.
- 18 An experiment was set up using a sealed container which holds  $30 \text{ cm}^3$  of water and  $70 \text{ cm}^3$  of air as shown below.  $20 \text{ cm}^3$  of water was removed from the container through the tap and  $10 \text{ cm}^3$  of air was then added using the pump.



What would be the final volume of the air in the container?

- (1)  $60 \text{ cm}^3$
- (2)  $70 \text{ cm}^3$
- (3)  $80 \text{ cm}^3$
- (4)  $90 \text{ cm}^3$

- 19 Hakim set up the following experiment in a dark room. The light sensor on the screen gave a reading of 80 units.

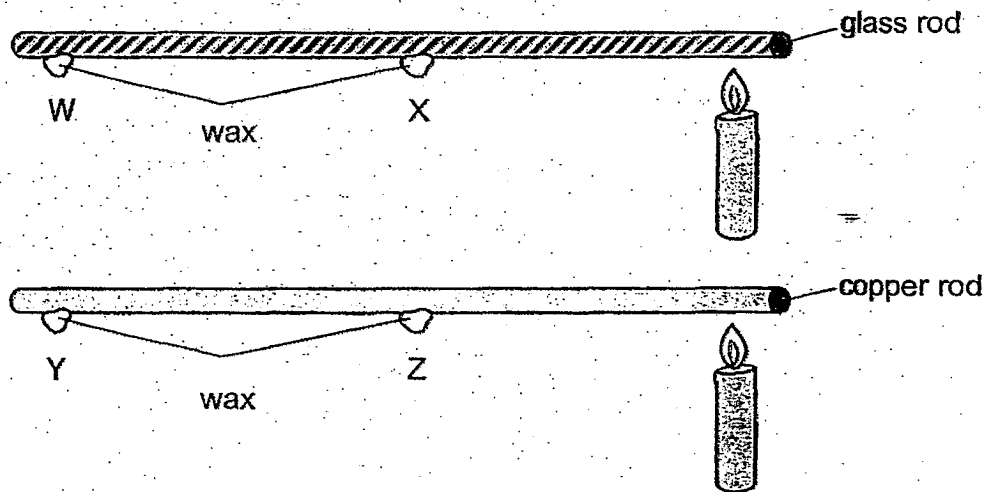


As Hakim moved one object in the set-up, the length of the shadow increased and the reading on the light sensor increased slowly to 150 units and then dropped to 0 units suddenly.

Which object did Hakim move and in which direction?

- (1) wooden block towards torch
- (2) torch towards wooden block
- (3) screen towards wooden block
- (4) screen away from wooden block

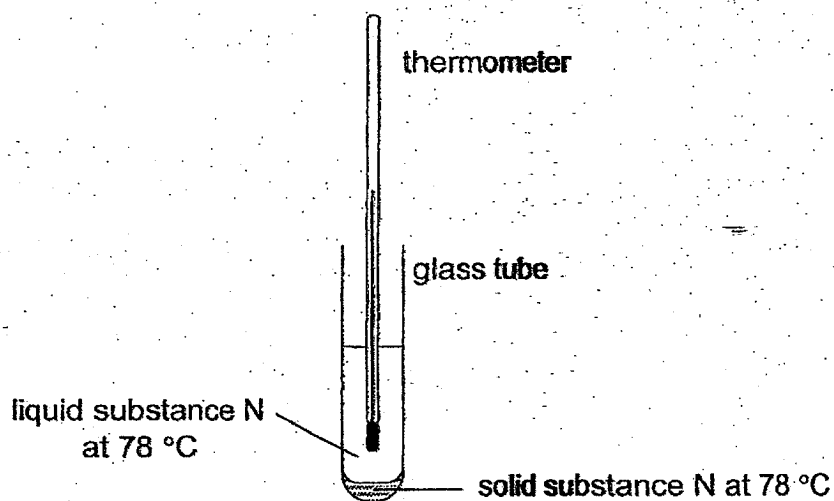
- 20 The diagram below shows a glass rod and a copper rod of the same size. Each rod has two pieces of wax placed at the same position and a flame is placed near one end of each rod as shown.



Which of the following shows the correct order in which the wax will melt (from the first to the last)?

	first wax to drop → last wax to drop			
(1)	X	Z	W	Y
(2)	X	W	Z	Y
(3)	Z	W	X	Y
(4)	Z	Y	X	W

- 21 Sam cooled liquid substance N from  $100\text{ }^{\circ}\text{C}$  in a room. The room temperature was  $30\text{ }^{\circ}\text{C}$ . He observed that some solid substance N appeared in the glass tube at  $78\text{ }^{\circ}\text{C}$  as shown below.



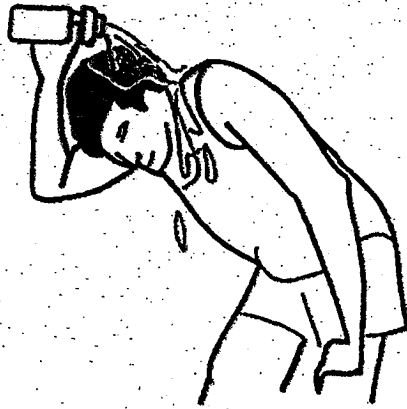
Both the liquid and solid substance N in the glass tube were at  $78\text{ }^{\circ}\text{C}$ .

What would happen to temperature of the liquid after a while? Why?

	Temperature of liquid	Reason
(1)	remain unchanged	The liquid did not lose heat.
(2)	decrease	The liquid lost heat during freezing.
(3)	remain unchanged	The liquid lost heat during freezing.
(4)	decrease	The solid gained heat during melting.



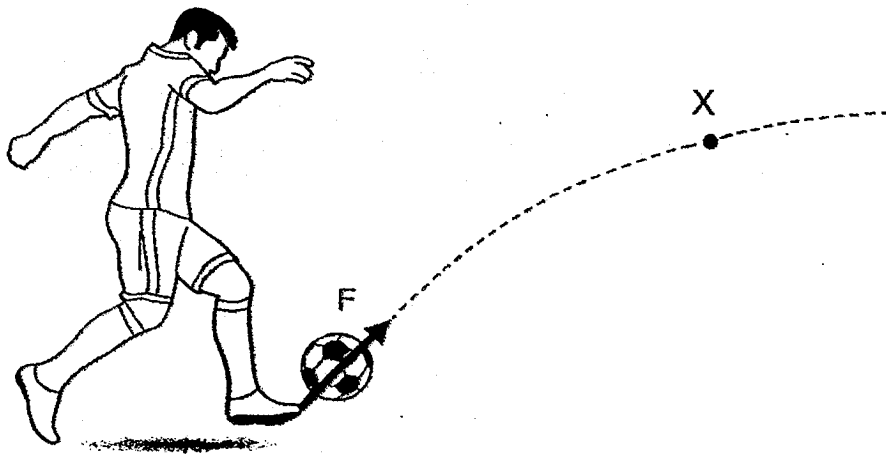
- 22 A jogger pours water on his head and neck to cool himself.



Which of the following explains how this can cool the jogger?

- (1) water gains heat and condenses
- (2) water gains heat and evaporates
- (3) water loses heat and condenses
- (4) water loses heat and evaporates

- 23 A man kicks a ball upwards with a force  $F$ .



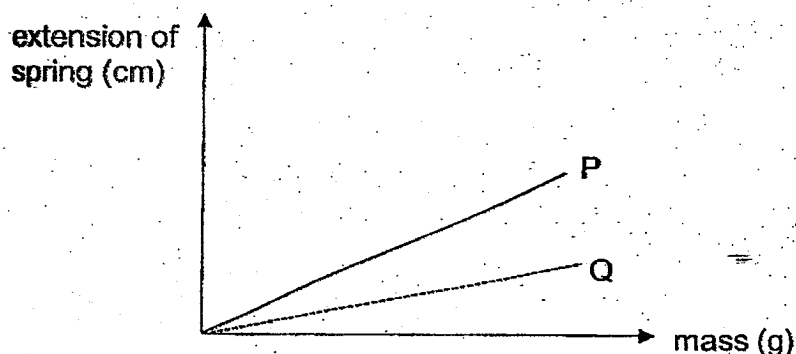
What are the forces acting on the ball at X?

	Force $F$	Weight	Friction
(1)	✓	✓	✓
(2)	✓	x	x
(3)	x	✓	x
(4)	x	✓	✓

**Key**

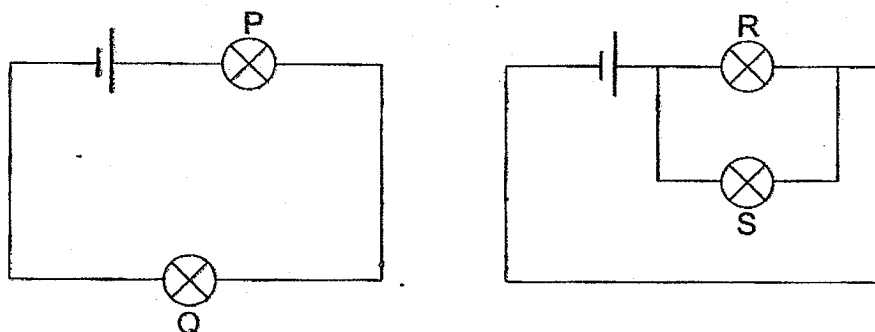
✓ present  
x absent

- 24 The graph below shows how the extensions of two springs, P and Q, are affected by the mass hung on the springs.



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

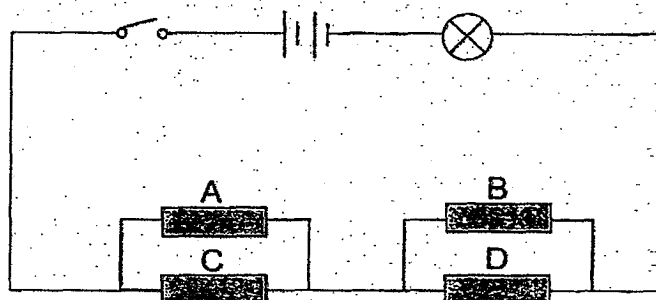
- (1) Spring P is stiffer than spring Q.
  - (2) Spring P is longer than spring Q for the same mass hung on them.
  - (3) Spring P and spring Q have the same length when no mass is hung on them.
  - (4) Spring P has the same elastic spring force as spring Q for the same mass hung on them.
- 25 Mariam set up two circuits using identical batteries and bulbs in working condition.



Which of the following statements is correct?

- (1) P is brighter than Q.
- (2) S is brighter than P.
- (3) P and R are equally bright.
- (4) Both R and S will not light up.

- 26 John wanted to investigate whether four rods, A, B, C and D, were electrical conductors or insulators. He used the circuit shown.



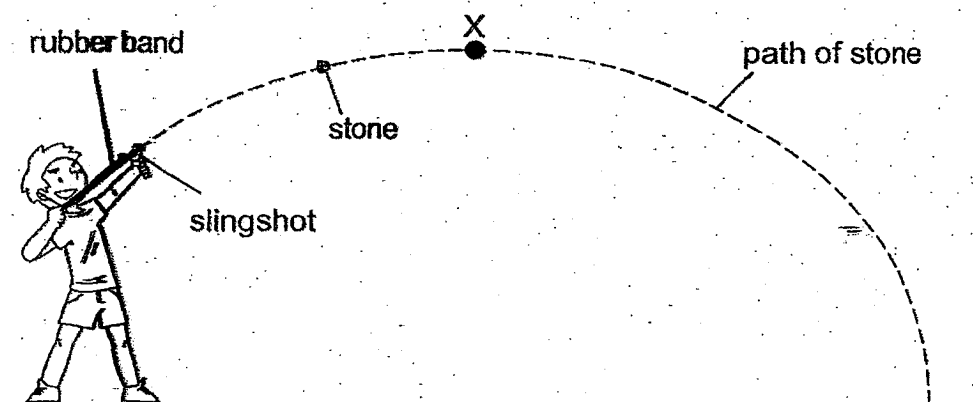
The table below shows what happened when the switch was closed and certain rods were removed.

Rods removed from circuit	Did the bulb light up?
A and B	yes
A and D	no
B and C	no
C and D	no

Which of the following conclusions about the rods is correct?

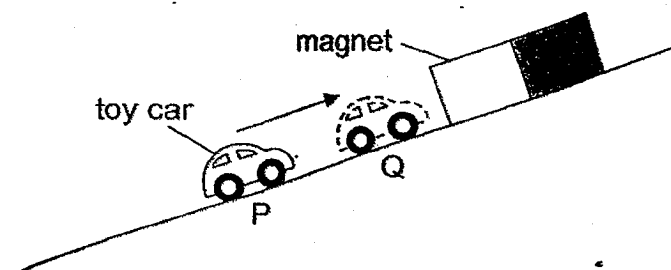
	A	B	C	D
(1)	conductor	conductor	insulator	insulator
(2)	conductor	insulator	conductor	conductor
(3)	insulator	insulator	conductor	conductor
(4)	insulator	conductor	conductor	insulator

- 27 Steven pulled back the rubber band of a slingshot with a stone. The diagram below shows the path of the stone after he released the rubber band.



What form(s) of energy does the stone have at point X?

- (1) kinetic energy only
  - (2) kinetic and gravitational potential energy only
  - (3) elastic potential and gravitational potential energy only
  - (4) elastic potential, kinetic and gravitational potential energy
- 28 A magnet and a toy car made of iron were placed close to each other as shown below.



When the toy car was released, it moved up the slope from P to Q. The speed of the toy car changed as it moved nearer to the magnet.

Which of the following shows the change in gravitational potential energy and kinetic energy of the toy car as it moved from P to Q?

	potential energy	kinetic energy
(1)	decrease	decrease
(2)	decrease	increase
(3)	increase	decrease
(4)	increase	increase

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**PEI CHUN PUBLIC SCHOOL**

**PRIMARY 6**

**PRELIMINARY EXAMINATION 2024**

**SCIENCE**  
**(BOOKLET B)**

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

Name: \_\_\_\_\_ ( )

Class: Primary 6 / ( ) \_\_\_\_\_

Date: 16 August 2024

Science Teacher: \_\_\_\_\_

Parent's Signature: \_\_\_\_\_

SECTION A	56
SECTION B	44
TOTAL	100

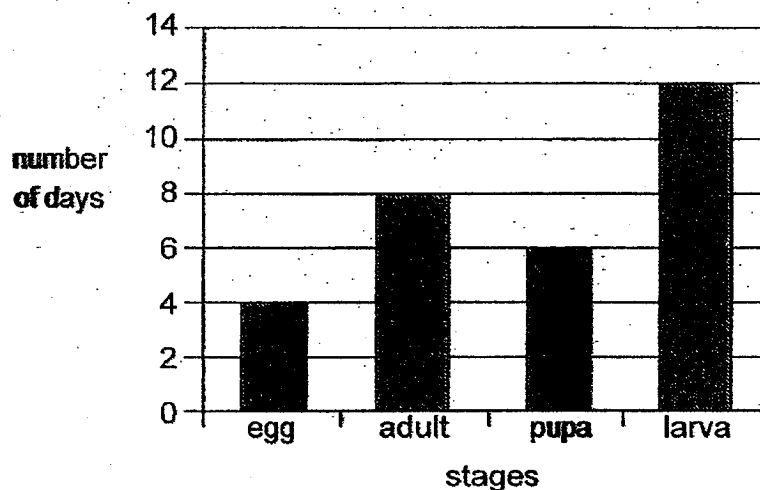
**INSTRUCTIONS TO CANDIDATES**

1. Do not turn over this page until you are told to do so.
2. Follow all instructions carefully.
3. Answer all questions.
4. Write your answers in this booklet.

**Section B (44 marks)**

For questions 29 to 40, write your answers in the spaces provided.

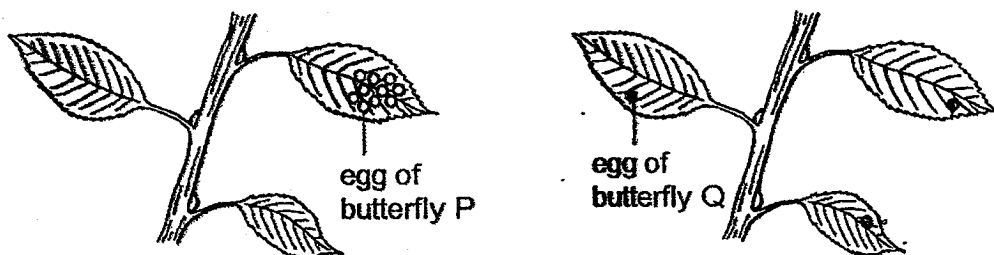
- 29 Siva studied the life cycle of butterfly P. He recorded the number of days spent at each stage of its life cycle in the graph below. However, he did not present the stages of the life cycle in the correct order.



- (a) Based on the results, how many days does it take for butterfly P to reach the adult stage after the egg has hatched? [1]

\_\_\_\_\_ days

- (b) Female butterflies P and Q can lay many eggs in a day. Butterfly P lays eggs in a cluster on a leaf, while butterfly Q lays one egg on each leaf as shown below.



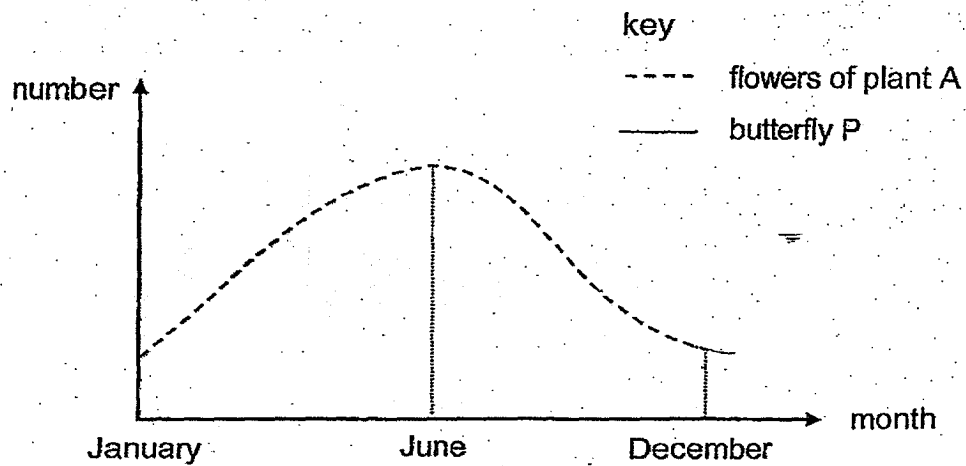
- (i) Explain how laying many eggs each time helps butterfly P in its survival. [1]

\_\_\_\_\_  
\_\_\_\_\_

- (ii) How does laying one egg on each leaf benefit the young of butterfly Q as compared to laying many eggs on a leaf? [1]

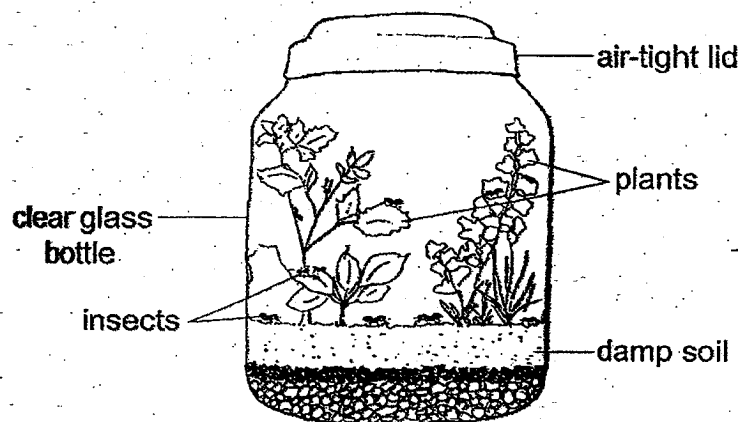
\_\_\_\_\_  
\_\_\_\_\_

- (c) Butterfly P only feeds on the nectar of the flowers of plant A. The graph below shows how the number of flowers of plant A changes throughout the year in a park.

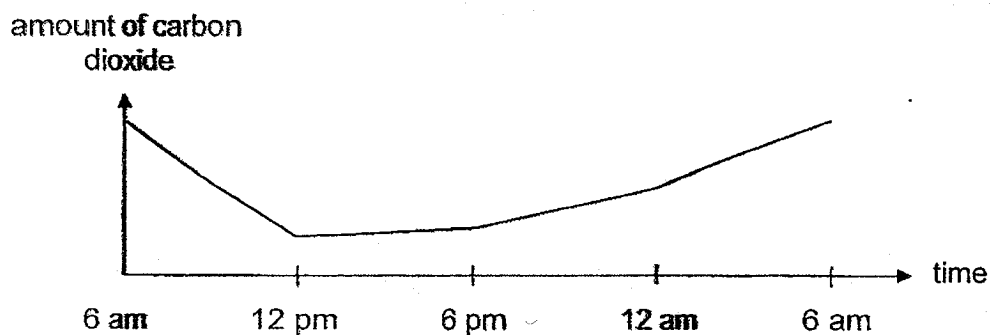
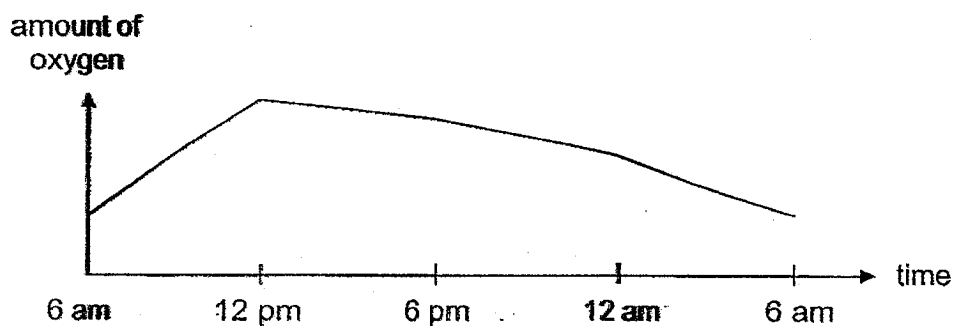


Using a pencil, draw a curved line on the graph to show how the number of butterfly P in the park changes throughout the year. [1]

- 30 Alan kept some plants and insects in a bottle as shown. He sealed the bottle tightly and placed it under the sun for one day.



The graphs below show the amount of oxygen and carbon dioxide in the bottle throughout the day.



- (a) Explain why the amount of oxygen increased from 6 am to 12 pm. [2]

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- (b) Explain why the amount of carbon dioxide in the bottle increased from 12 pm to 6 pm. [2]

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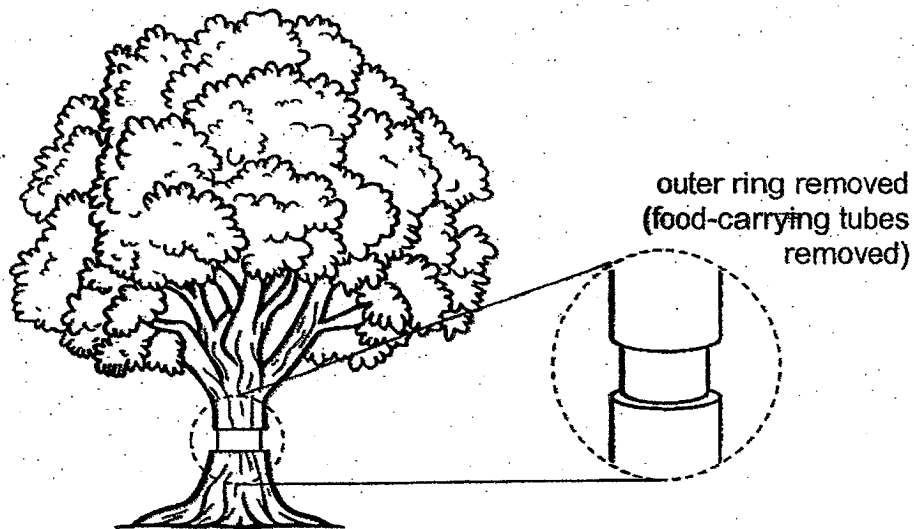
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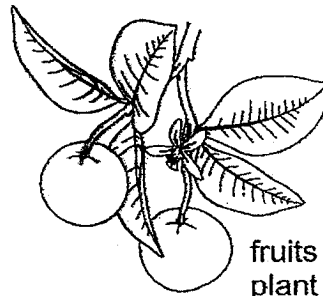
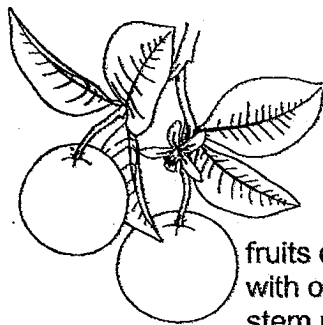
- (c) The amount of gas X in the bottle remained the same throughout the day. Identify gas X. [1]

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- 31 Leo conducted an experiment using two similar plants. He removed an outer ring from the stem of one of the plants as shown below. The food-carrying tubes were removed while the water-carrying tubes remained in the stem.



After some time, the two plants produced fruits as shown below.



Suggest why the plant with the outer ring of stem removed produced bigger fruits than the other plant. [2]

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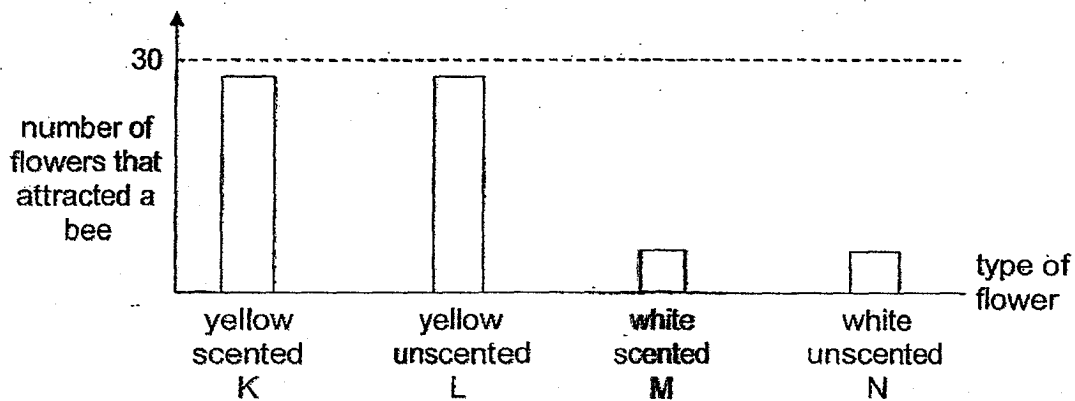
32 Bees are commonly found near flowering plants.

(a) Describe how bees help plants to reproduce.

[1]

Amelia wanted to find out which type of flowers bees prefer. She made model flowers of the same shape and size using yellow and white cards. She put 10 drops of scented water in the centre of some yellow model flowers and some white model flowers.

Amelia made a total of 30 of each type of flower, K, L, M and N. For each type, she counted the number of the flowers that attracted a bee.



Amelia concluded that the colour of the flower would affect the ability of the flower to attract a bee.

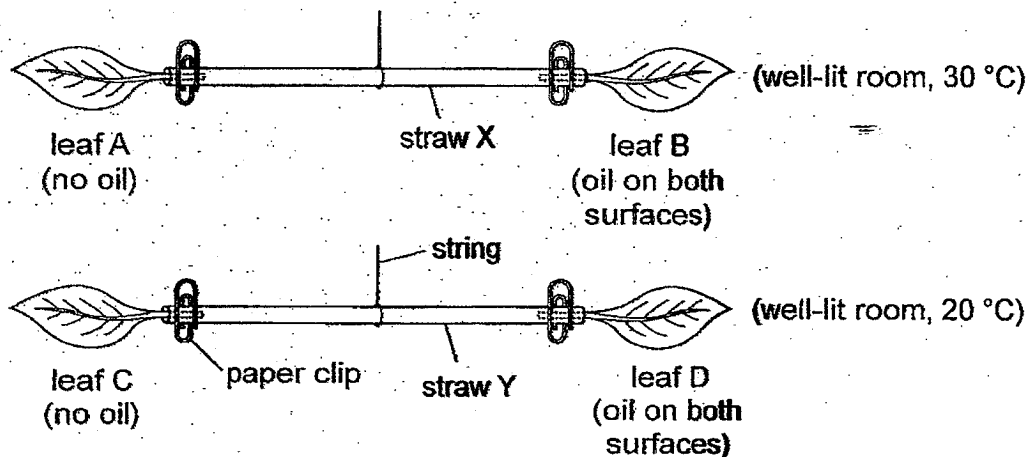
(b) Which two types of flowers, K, L, M and N, did she use to arrive at this conclusion? Explain your answer. [2]

(c) In a population of plant P, each plant has only yellow or only white flowers.

Amelia collected seeds from plant P with yellow flowers to grow new plants. Explain why the new plants will only have yellow flowers. [1]

- 33 Sunil set up an experiment with four similar leaves, A, B, C and D, to find out how the surrounding temperature affects the rate of water lost from the leaves.

He coated both surfaces of leaves B and D with clear oil that did not drip. Then, he balanced the leaves on two identical straws, as shown below, in two different locations.

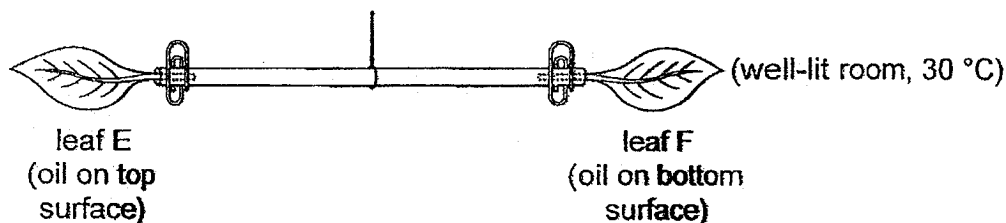


He recorded the time taken for the straws to be tilted. His results are shown in the table below.

Straw	Temperature (°C)	Time taken for straw to be tilted (min)	Side that tilted downwards
X	30	4	leaf B
Y	20	12	leaf D

- (a) Based on his experiment, how did the surrounding temperature affect the rate of water lost from the leaves? [1]

- (b) Sunil set up another experiment with two similar leaves, E and F. He coated only one surface of each leaf with clear oil that did not drip.

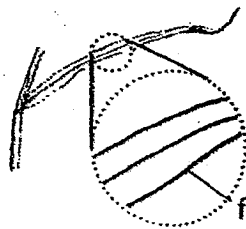


What observation would show that the leaves have more stomata on the bottom surfaces than on the top surfaces? [1]

(c) The diagram below shows grass M.

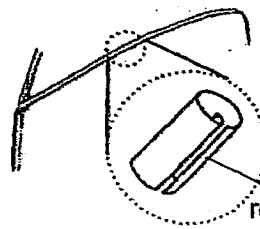


The leaves of grass M have more stomata on the bottom surfaces than on the top surfaces. On a cool day, the leaves of grass M are flat as shown in diagram 1. On a hot day, the leaves of grass M are rolled up as shown in diagram 2.



flat leaf

diagram 1 (cool day)



rolled-up leaf

diagram 2 (hot day)

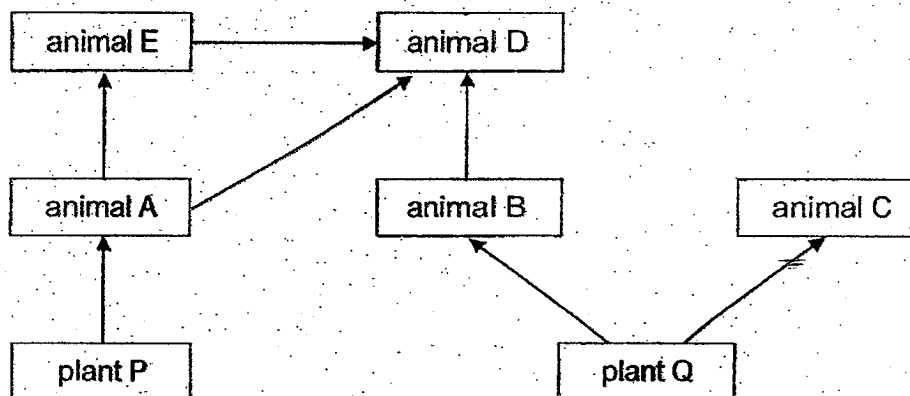
Based on Sunil's experiments, explain how rolling its leaves on a hot day will benefit grass M. [2]

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- 34 The diagram below shows a food web in a grassland.



- (a) A large number of animal C moved into the grassland. The number of animal D remained the same.

How would the population of animal B and animal E change? Explain your answer. [2]

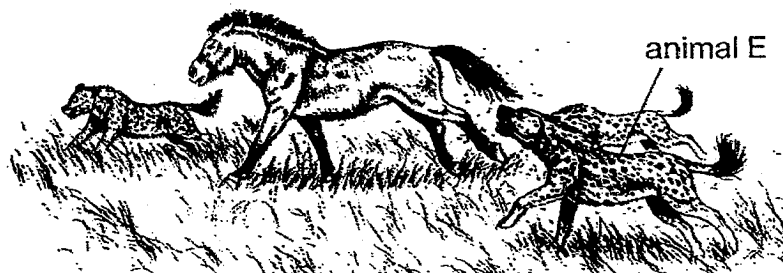
Effect on animal B and reason: \_\_\_\_\_

\_\_\_\_\_

Effect on animal E and reason: \_\_\_\_\_

\_\_\_\_\_

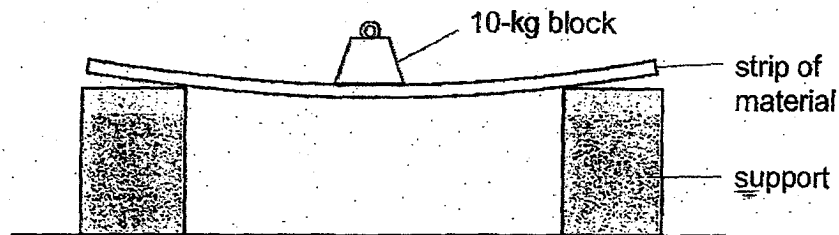
- (b) Animal E hunts in a group as shown below.



Suggest an advantage for animal E to hunt in a group. [1]

\_\_\_\_\_

35. Max set up an experiment as shown below to investigate a property of three strips made of materials A, B and C. On each strip, he added 10-kg blocks until the strip broke.

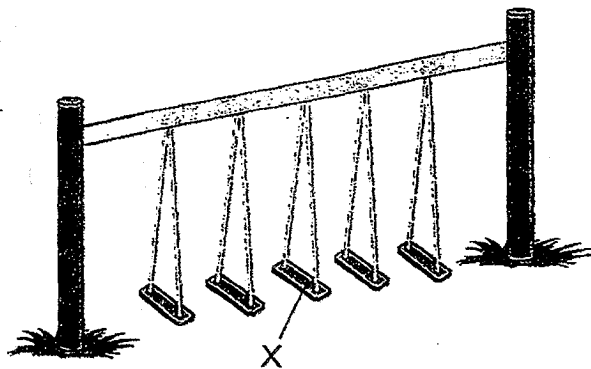


His results are shown in the table below.

Material	A	B	C
Number of 10-kg blocks added	6	3	9

- (a) Name the property of material that Max investigated in his experiment. [1]

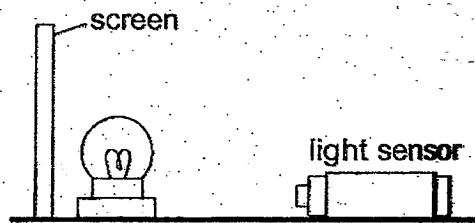
- (b) Max wanted to build an obstacle course for his friends to cross by stepping on parts X as shown in the diagram below.



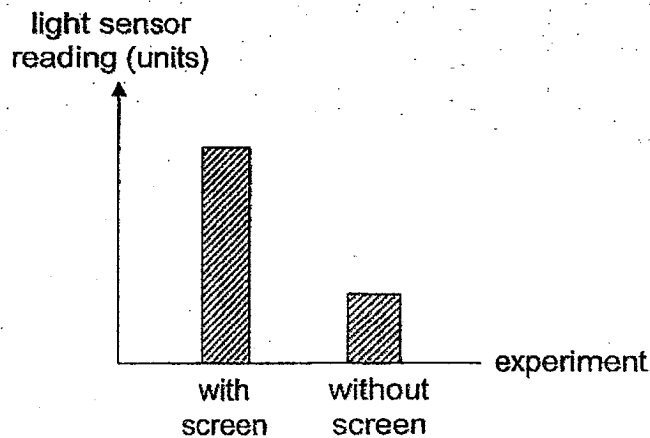
Based on Max's results, which material, A, B or C, is most suitable for making part X? Explain your answer. [1]

- (c) Max used strips of the same thickness for his experiment. Explain how this ensures that his experiment is fair. [1]

- 36 Asman conducted an experiment in a dark room using the set-up below. He recorded the amount of light detected by the light sensor.



Asman repeated his experiment by removing the screen. His results are shown below.



- (a) Explain why the light sensor gave a higher reading with the screen compared to without the screen. [1]

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- (b) Asman wanted to investigate if the colour of the screen affects the amount of light detected by the light sensor.

State two variables that he must keep the same to ensure a fair test. [2]

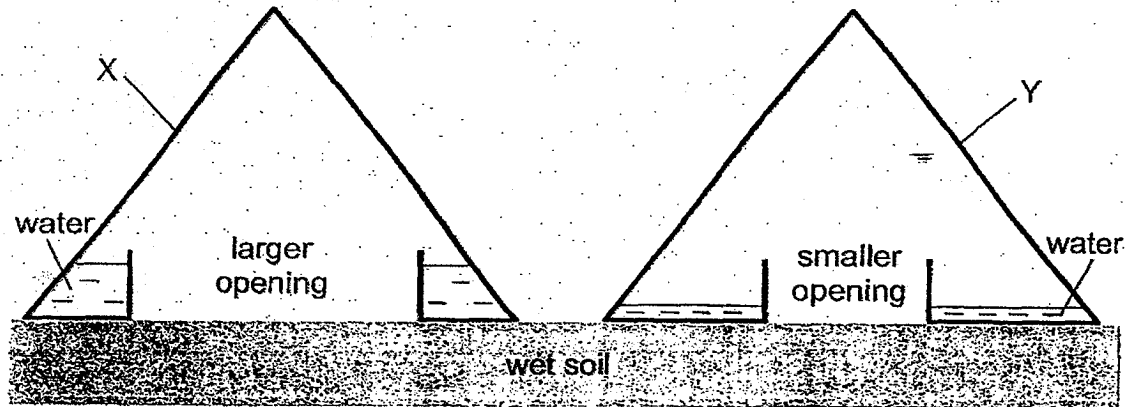
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- 37 On a sunny day, Yati placed two cones, X and Y, on wet soil. Cones X and Y were similar but X had a larger opening at the base than Y.

After a while, Yati observed some water droplets on the cones and water was collected at the base of each cone as shown.



- (a) Describe how the water droplets on the cones were formed. [2]

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- (b) Explain why the water droplets flowed into the base of the cone. [1]

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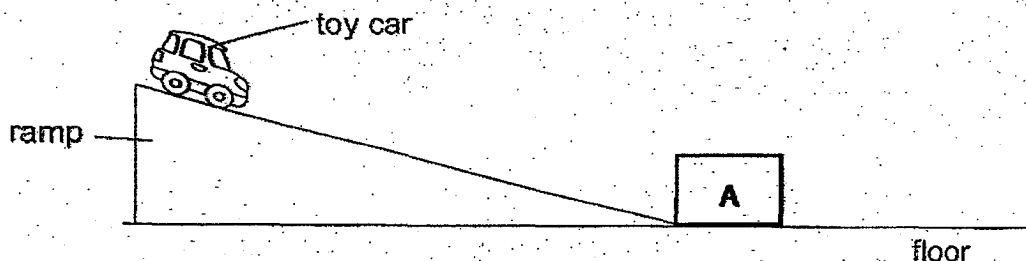
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- (c) More water was collected in X than in Y after a few hours. Explain why. [1]

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- 38 Ali conducted an experiment using a toy car, a ramp and a plastic box, A, as shown below.



He released the toy car from the top of the ramp. The toy car hit the box and pushed it along the floor. He recorded the distance travelled by box A on the floor. He repeated the experiment with a similar plastic box, B.

The table below shows the results of his experiment.

Box	Mass of box (g)	Distance travelled on floor (cm)		
		First reading	Second reading	Third reading
A	100	50	52	49
B	400	15	16	14

- (a) Based on the results, state the relationship between the mass of the box and the distance travelled by the box on the floor. [1]

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- (b) Explain why box A did not travel the same distance as box B. [1]

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- (c) Explain why Ali's results are reliable. [1]

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- (d) Ali wanted to increase the distances travelled by the boxes. His friend suggested that he could add oil to the surface of the floor.

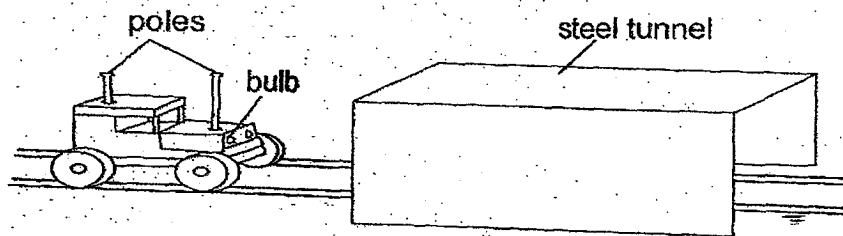
Do you agree with his friend's suggestion? Explain your answer. [1]

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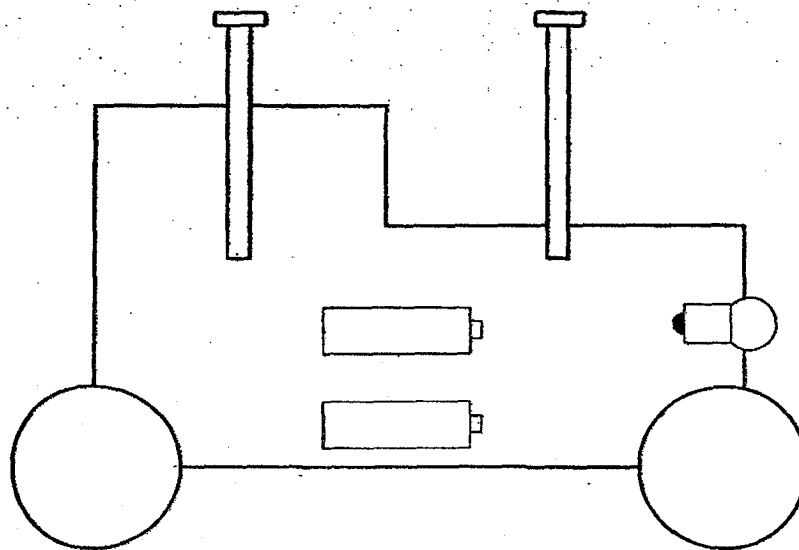


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- 39 Rita has a toy car and a steel tunnel as shown in the diagram below. Both the toy car and the steel tunnel are of the same height.



The diagram below shows the side view of the electric circuit in Rita's toy car. She set up part of the electric circuit in her toy using a bulb, two batteries and two poles but has not put in the wires. All the components are working.



The bulb on the toy car only lit up when the toy car was moving completely under the steel tunnel.

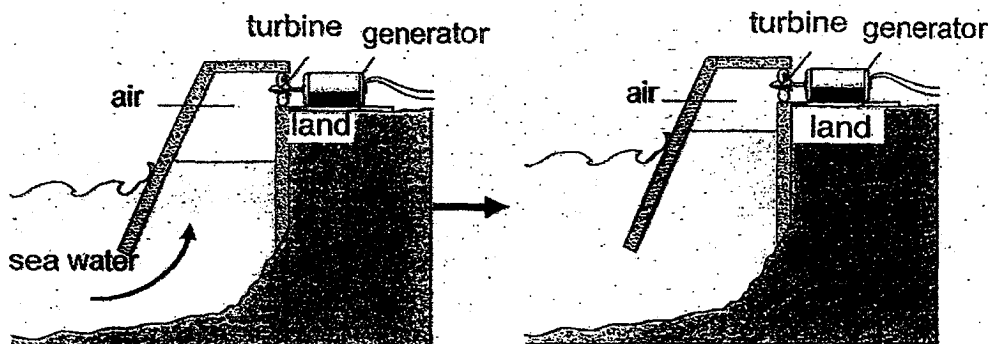
- (a) Using a pencil, complete the circuit above by drawing the wires in the toy car so that that the bulb lights up the brightest when the toy car is in the tunnel. [2]

- (b) Name a property of the poles which allows the bulb to light up when the toy car is in the tunnel. [1]

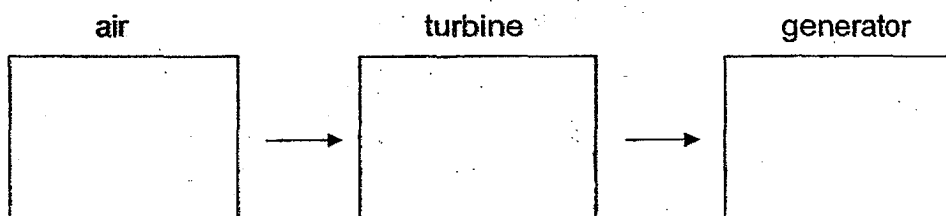
- (c) The bulb does not light up when only one of the steel poles touches the steel tunnel. Explain why. [1]

- 40 The diagram below shows how the movement of sea water can be used to generate electricity.

When the sea water rushes towards the land, the water level rises up, pushing the air to turn the turbine.



- (a) Based on the diagram, fill in the boxes to show the energy changes as electricity is generated. [1]



- (b) When the sea water stopped moving, the turbine stopped turning after a while. Explain why the turbine stopped turning. [2]

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- (c) Most power stations use fuels to generate electricity.

State one advantage of using the movement of sea water to generate electricity as compared to most power stations. [1]

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End of Section B

## ANSWER KEY

YEAR : 2024  
LEVEL: PRIMARY 6  
SCHOOL: PEI CHUN PUBLIC SCHOOL  
SUBJECT: SCIENCE  
TERM: PRELIMINARY

### BOOKLET A

Q1	2	Q2	2	Q3	1	Q4	3	Q5	1
Q6	2	Q7	2	Q8	2	Q9	4	Q10	2
Q11	4	Q12	2	Q13	3	Q14	2	Q15	3
Q16	4	Q17	3	Q18	4	Q19	2	Q20	4
Q21	3	Q22	2	Q23	4	Q24	4	Q25	2
Q26	3	Q27	2	Q28	4				

Pei Chun Public School  
Primary 6 Science  
Preliminary Examination 2024

Name: \_\_\_\_\_ ) Class: Primary 6 / ( \_\_\_\_\_ )

**Booklet B**

29 a) After the egg has hatched, the insect will be in the larva (12 days) and pupal stage (6 days) before it becomes an adult.

$$12 + 6 = 18 \text{ days}$$

b) Concept: Laying many eggs increases the chances for some of the eggs / young to survive.

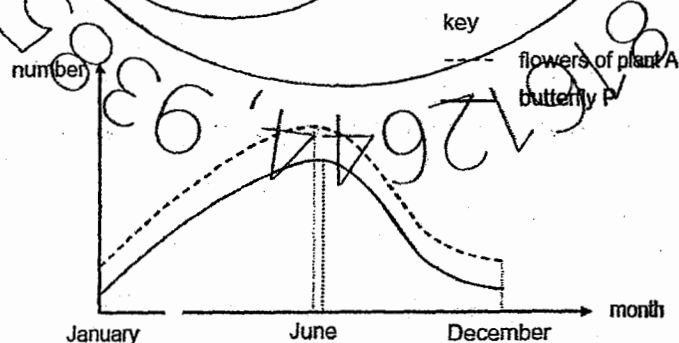
Some of the eggs and young may be eaten by predators. Laying more eggs will increase the chances for some of the young to survive.

c) Concept: Animals in the same habitat may compete with one another for food.

\* Note: The butterfly lays its eggs on a leaf to allow its larvae to have immediate access to food upon hatching.

The larva will be able to feed on more food upon hatching. / The larva does not need compete with the other larvae for food.

d) Concept: The population of an organism is affected by the availability of its food.



- The energy transferred decreases along a food chain. Thus, there should be more producers (flowers) than consumers (butterflies).
- When the number of flowers decreases in June, the butterflies will have less food and the number of butterflies will decrease shortly after June.

30 a) Concepts: - Plants produce oxygen during photosynthesis.  
- Living things use oxygen for respiration.

From 6 am to 12 pm, the plants could get light for photosynthesis and produced oxygen. The amount of oxygen given out by the plants was more than the amount taken in by the insects. Thus, the amount of oxygen in the bottle increased.

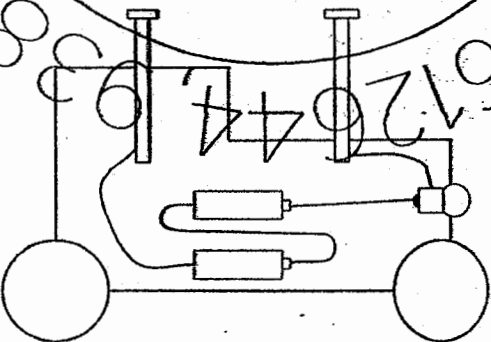
b) Concepts: - Plants take in carbon dioxide during photosynthesis.  
- Living things produce carbon dioxide during respiration.

The amount of light the plants received decreased from 12 pm to 6 pm. The plants took in less carbon dioxide for photosynthesis. The amount of carbon dioxide given out by the insect was more than the amount taken in by the plants. Thus, the amount of carbon dioxide in the bottle increased.

c)	<p>Concept: Animals and plants do not take in or produce nitrogen.</p> <p>Nitrogen</p>
31	<p>Concept: Food made by leaves is transported from leaves to the other parts of the plant through the food-carrying tubes.</p> <p><i>*Note: Food is often stored in fruits in the form of sugar, not starch.</i></p> <p>Part of the food-carrying tubes in the stem, so food made in the leaves could not be transported to the roots. Thus, more food was transported to and stored in the fruits.</p>
32 a)	<p>Concept: Flowers can be pollinated by insects (bees and butterflies). Pollination is the transfer of pollen grain from the anther to the stigma.</p> <p><i>*Do NOT just state the process, you need to describe it.</i></p> <p>The bees help transfer the pollen grains from the anther of a flower to the stigma of another flower of the same kind.</p>
b)	<p>To ensure a fair test, you should vary only the changed variable and keep all other variables the same.</p> <ul style="list-style-type: none"> <li>changed variable: colour of flower</li> <li>variable to be kept the same: presence of scent in the flower</li> </ul> <p>Use the experimental results to support the conclusion. The measured variable is "number of flowers that attracted a bee", not the "number of bees attracted to the yellow flowers".</p> <p>Flowers K and M / Flowers L and N</p> <p>The number of yellow flowers that attracted a bee was more than the number of white flowers that attracted a bee.</p> <p>OR</p> <p>More of the yellow flowers (type K and L) attracted a bee.</p>
c)	<p>Concept: Parents pass on traits / characteristics to their young.</p> <p>The characteristic / traits of having yellow flowers was passed on from parent plant P to its young plants.</p> <p>OR</p> <p>The young plants inherited the characteristic / traits of having yellow flowers from parent plant P.</p>
33 a)	<p>Concept: Leaves lose water vapour through the stomata.</p> <p>The oil blocked the stomata on leaves B and D. Thus, only leaf A and C lost water. When the leaves lost water, the mass of the leaves decreased and the straws tilted:</p> <p><b>shorter time taken for the straw to tilt = faster rate of water loss</b></p> <p>As the <u>surrounding temperature</u> increases, the <u>rate of water lost</u> from the leaves increases.</p>
b)	<p>If leaves E and F have "more stomata on the bottom surface", leaf F would have more stomata blocked by the oil. Leaf F would lose less water than leaf E and be heavier.</p> <p>After some time, <u>the side of the straw with leaf F would tilt downwards.</u></p>
c)	<p>- Leaves lose more water through the stomata when the temperature is higher.</p> <p>- Leaves lose less water when there are fewer stomata exposed to the air.</p> <p>When the leaf of grass M is rolled up, the bottom surface of the leaf is not exposed to the air.</p> <p>By rolling up the leaves on a hot day, fewer stomata on the leaves will be exposed to the air, the leaves will lose less water (vapour) through the stomata.</p>

34 a)	<p>Concept: When there is a <u>change</u> in the number of <u>an</u> organism in a food web, the number of other organisms in the food web <u>will</u> be affected.</p> <p><u>Effect on animal B and reason:</u> The number of animal B <u>would</u> decrease. Both animals C and B feed on plant Q. <b>More plant Q would be eaten by animal C, so animal B would have less plant Q to feed on.</b></p> <p><u>Effect on animal E and reason:</u> The number of animal E <u>would</u> decrease. Animal D feeds on animal B and E. <b>Animal D would have fewer animal B to feed on, so animal D would feed on more animal E.</b></p>
b)	<p>Concept: Animals have <u>behavioural</u> adaptations to <u>help</u> them obtain food <u>more</u> easily.</p> <p>Hunting in a group allows animal E to <b>catch their prey more easily</b>. It also allows them to take down a larger and stronger prey.</p>
35 a)	<p>Concept: Strength is the ability to withstand a load / force without breaking (Max added the weights on the strip until it broke.)</p>
	Strength
b)	<p>Material C. It is the <b>strongest material</b>. / It can <b>hold the most mass / weight without breaking</b>.</p>
c)	<p>You should explain how the <u>action</u> / variable would <u>affect</u> the <u>experiment</u> conducted. Do NOT give a general statement.</p> <p>The thickness of the strip affects its strength / the number of blocks needed to break the strip.</p>
36 a)	<p>Concept: An object can reflect, absorb and block light.</p> <p>The screen reflected light from the light bulb to the light sensor.</p>
b)	<p>To ensure a fair test, you should vary only the <u>changed</u> variable and keep all other variables (that would affect the <u>experimental results</u>) the same.</p> <ul style="list-style-type: none"> <li>changed variable: <u>colour of the screen</u></li> <li>measured variable: <u>amount of light detected by the light sensor</u></li> </ul> <p>Distance between the light sensor and the screen / lamp Material / size of the screen</p>
37 a)	<p>Check your description of the <u>condensation</u> process using ST3P.</p> <ul style="list-style-type: none"> <li>Source of water vapour</li> <li>Temperature difference</li> <li>Point of contact (place where the water droplets are formed)</li> <li>Process (water vapour lost heat and condensed)</li> <li>Product (water droplets)</li> </ul> <p>The <b>water in the wet soil</b> gained heat from the Sun and <b>evaporated</b>. The <u>warm</u> water vapour touched the <u>cooler</u> inner surface of the cone, lost heat and <b>condensed</b> into water droplet.</p>
b)	<p>Concept: Earth's gravity pulls <u>objects</u> towards the <u>centre</u> of the Earth / ground.</p> <p>You should explain why the <u>water droplets</u> flowed <u>down</u> to the base of the cone, not just how the shape of the cone allows water to be collected at the base.</p> <p>The water droplets slid down the inner surface of the cone and flowed into the base <b>due to gravity</b>.</p>



c)	<p>Concept: The <b>rate</b> of evaporation is affected by the amount of <b>exposed surface area</b> of water.</p> <p>The <b>wet soil</b> under cone X had a <b>greater exposed surface area</b>, so water evaporated <b>more quickly</b> from the wet soil.</p>
38 a)	<p>As the mass of <b>the box</b> increases, <b>the distance travelled by the box</b> on the floor decreases.</p>
b)	<p>Concept: As the <b>mass</b> of an object increases, the amount of <b>friction</b> acting between its base and the surface that <b>it is moving on</b> increases.</p> <p>As <b>box A</b> was <b>lighter</b> than box B, there was <b>less friction between box A and the floor</b>. This allowed <b>box A</b> to move a longer distance.</p>
c)	<p>For <b>each box</b>, the experiment is conducted (at least) three <b>times</b> to allow <b>us</b> to check that that <b>readings obtained are consistent (small differences in the readings)</b>.</p> <p>An average reading can be calculated for <b>each box</b> and this <b>increases</b> the reliability of the results. If a reading has a <b>value much higher or much lower</b> than the <b>others (outlier)</b>, the experiment should be <b>repeated</b>, and the outlier will <b>not</b> be included in the <b>calculation</b> of the average reading.</p> <p>By writing "<b>(All) the results / readings are consistent</b>", it is <b>not clear</b> which set of readings you are referring to. Be <b>specific</b> in your answer.</p> <p>For <b>each box</b>, the <b>three readings are consistent / about the same</b>. OR The <b>differences in the three readings for each box are small</b>.</p>
d)	<p>Concept: Oil is a <b>lubricant</b> that reduces <b>friction</b></p> <p>Yes. The oil would <b>reduce the friction between the box and the floor</b>.</p>
39 a)	<p>- For the bulb to <b>light up</b>, the metal tip and metal casing should be connected to the circuit.</p> <p>- For the bulb to <b>light up the brightest</b>, the batteries should be <b>connected in series</b> (positive terminal of one battery connected to the negative terminal of the other battery)</p>
	
b)	<p>Concept: <b>Electrical conductors</b> allow electric current to flow <b>through</b> them.</p> <p>They are <b>electrical conductors</b>. / They <b>conduct electricity</b>.</p>
c)	<p>Concept: When a <b>circuit</b> is open, electric current does not flow <b>in the circuit</b>.</p> <p>The circuit is <b>open</b>.</p>
40 a)	<p>Concept: <b>Energy</b> can exist in many forms and it can be <b>converted</b> from one form to another.</p> <p><b>kinetic energy (air) → kinetic energy (turbine) → electrical energy (generator)</b></p>

b) Concept: A moving object slows down / stops moving when its kinetic energy is converted to other forms of energy.

**When the sea water and air stopped moving, no kinetic energy was transferred from the air to the turbine, but the turbine did not stop turning immediately.**

**The turbine continued to turn for a while before stopping. Thus, you should explain that the turbine stopped turning due to conversion of the kinetic energy in the turbine to other forms of energy.**

**The kinetic energy in the moving turbine was converted to heat energy (and sound energy) due to the friction between the moving parts in the turbine and electrical energy. The turbine stopped moving when it had lost all its kinetic energy / had no kinetic energy left.**

c) Concept: Energy from the Sun, running water and wind cannot be used up. Most power stations generate electricity by burning fossil fuels.

Moving sea water / tidal energy is a source of energy that will not run out, (but fossil fuel can run out).

OR

Moving sea water / tidal energy is a renewable source of energy but fossil fuel is not.

OR

Generating electricity from moving sea water / tides does not produce greenhouse gases but generating electricity by burning fossil fuel does

