PRIMARY 6 SCIENCE

SEMESTRAL ASSESSMENT 1
2016

BOOKLET A

Date : 4th May 2016
Duration : 1 h 45 min

Name : _____ ( )

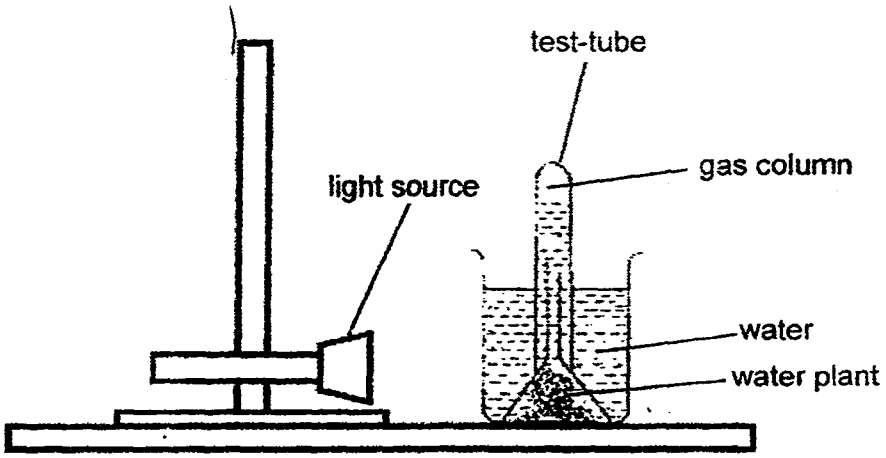
Class: Primary 6 (

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.
FOLLOW ALL INSTRUCTIONS CAREFULLY.

Booklet A consists of 24 printed pages including this cover page.

Section A (30 x 2 marks = 60 marks)
For each question from 1 to 30, 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.**

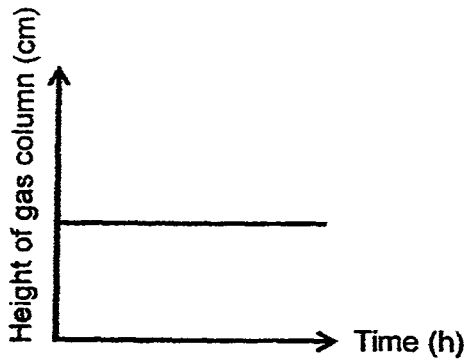
1. Study the set-up below.



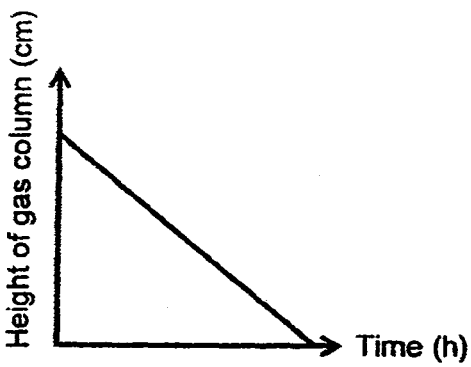
Bubbles were forming inside the test tube, forming a gas column.

Which one of the following graphs correctly shows the height of the gas column in the test-tube over a period of 2 hours?

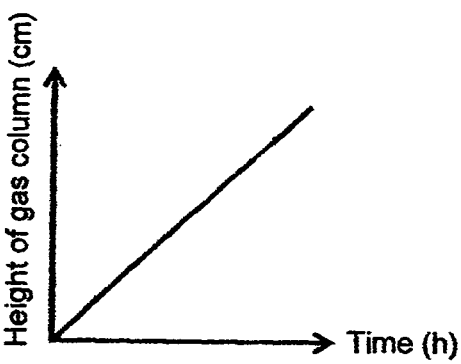
(1)



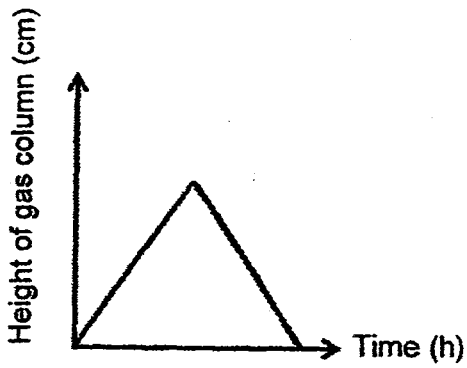
(2)



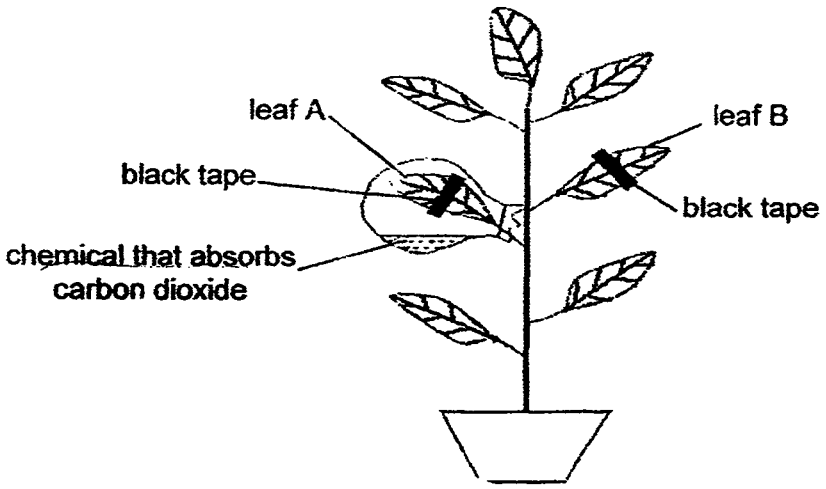
(3)



(4)

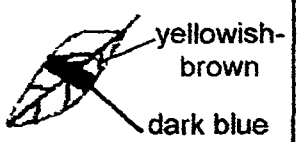
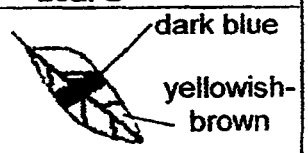


2. Study the diagram below.



A potted plant was left in a dark room for 12 hours before being placed under the sun for 6 hours. The leaves were then decolourised and tested for starch using iodine solution.

Which of the following correctly shows the appearance of iodine on the leaves at the end of the experiment?

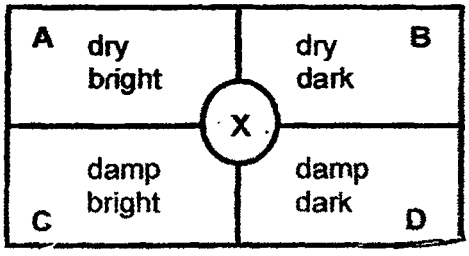
	Leaf A	Leaf B
(1)		
(2)		
(3)		
(4)		

3. Which of the following are necessary for photosynthesis to take place?

A water
B oxygen
C sunlight
D water vapour

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

4. Martin conducted an experiment to find out the preferred living conditions of Animal Z. The diagram below shows a closed glass box divided into four equal parts, A, B, C and D. Each part has a different condition.



top view of box

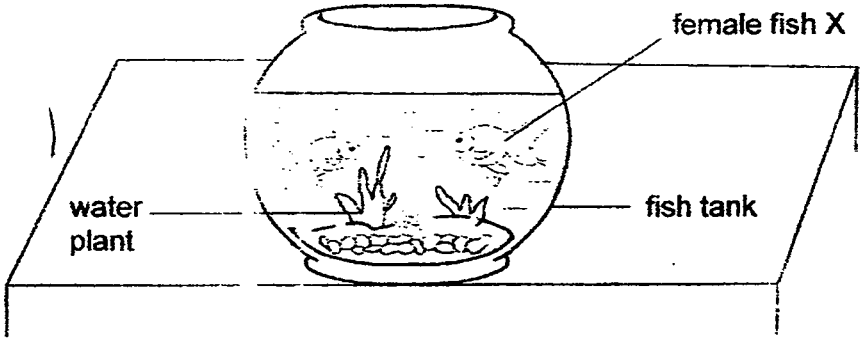
Martin put 16 Animal Z in the centre (X). The result below shows the number of Animal Z in different parts of the glass box after three hours.

	A	B	C	D
Number of Animal Z after three hours	0	8	0	8

Which one of the following reasons can be concluded about the preferred habitat of Animal Z based on the results above?

(1) Animal Z is only affected by the amount of light.
(2) Animal Z requires water to survive in the habitat.
(3) Animal Z survives best in a dry and dark environment.
(4) Animal Z can only survive in a dark and damp environment.

5. Some pupils set up a fish tank with two female fish X. They wanted to increase the population of fish X and suggested the following ways.

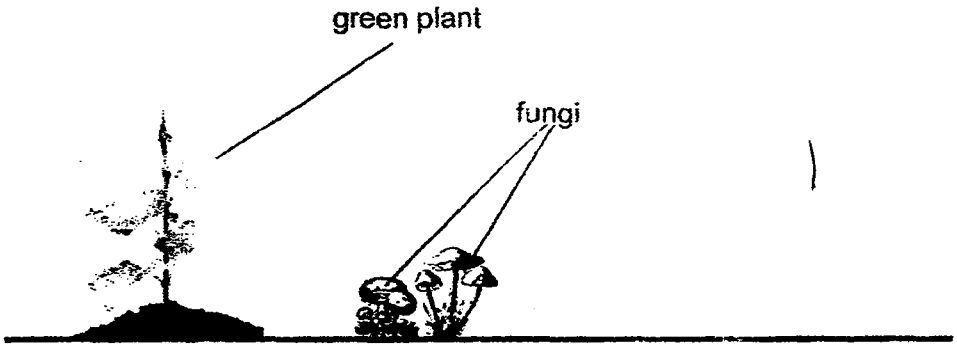


Pupil A	Add two male fish X.
Pupil B	Add two more female fish X.
Pupil C	Add more water plants and fish food.
Pupil D	Fix a light source beside the fish tank to be switched on at night.

Which of the following pupils' suggestions would most likely help to increase the population of fish X after some time?

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

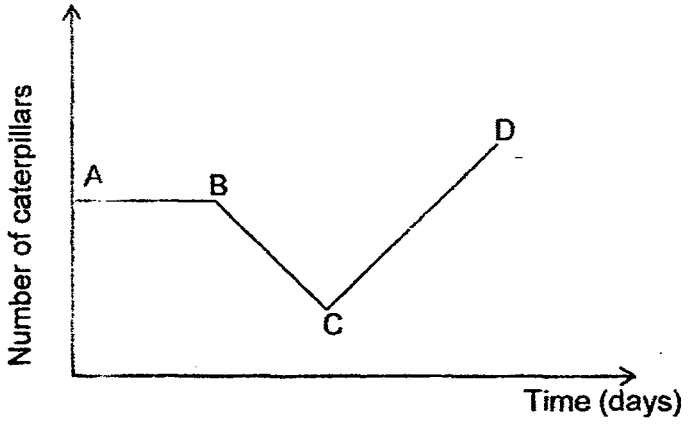
6. Xing Yan went to a park and observed that there were some fungi growing near a green plant.



Which of the following states the negative impact that the presence of fungi has on the green plant?

(1) They compete with the plant for space and water.
(2) They help in the decaying of dead organisms near the plant.
(3) They give out carbon dioxide during decomposition which the plant could use to make food.
(4) They break down waste matter into simpler substances which the plant could use as mineral salts.

7. The graph below shows the change in the number of caterpillars in a garden.

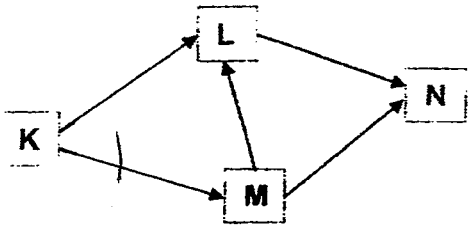


Which of the following events could be taking place from B to C?

A Some caterpillars were eaten by birds.
B Some caterpillars developed into pupae.
C Some caterpillars hatched from the eggs.
D Some caterpillars were killed by pesticides.

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

8. The food web below shows the relationship among the organisms K, L, M and N in a habitat.



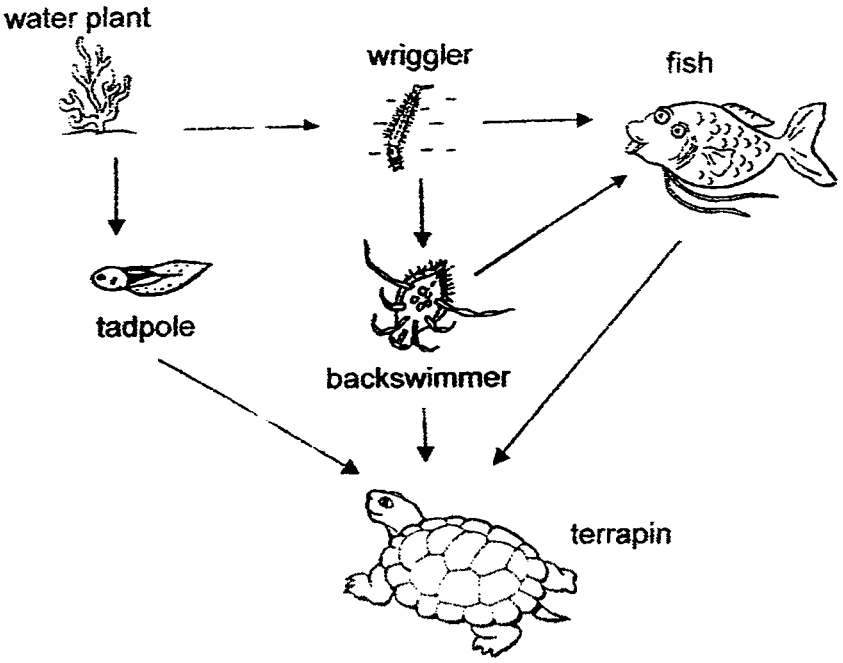
Organism X was then introduced into the habitat. It fed on only one type of organism in the food web.

After one month, all the other organisms decreased in number.

Which organism did X most likely feed on?

(1) K
(2) L
(3) M
(4) N

The food web below shows the relationship between the organisms found in a pond community in the park. Use the food web below to answer questions 9 and 10.



9. Which of the following statements about the food web are **false**?

A The tadpole is both a prey and a predator.
B There are only three food chains that could be formed from the food web.
C There are only two organisms which get their energy directly from the water plant.
D A decrease in the population of the water plants affects the populations of the wriggler and tadpole.

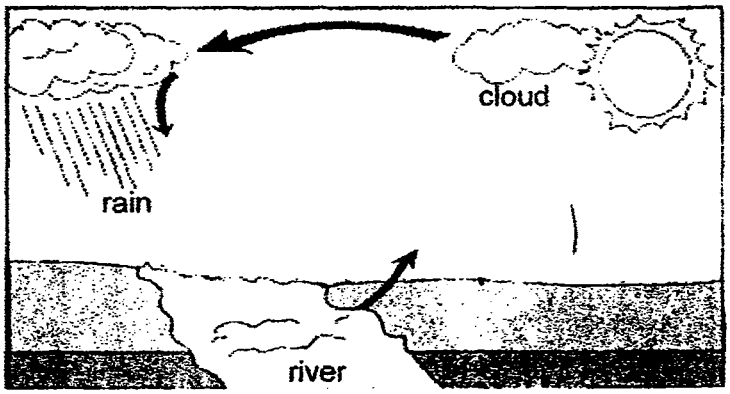
(1) A and B only
(2) A and D only
(3) B and C only
(4) B , C and D only

10. Which of the following states a direct impact on the organisms in the food web if there is an increase in the number of terrapins?

A The number of fish will increase.
B The number of tadpoles will decrease.
C The number of mosquitoes will increase in the park.

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

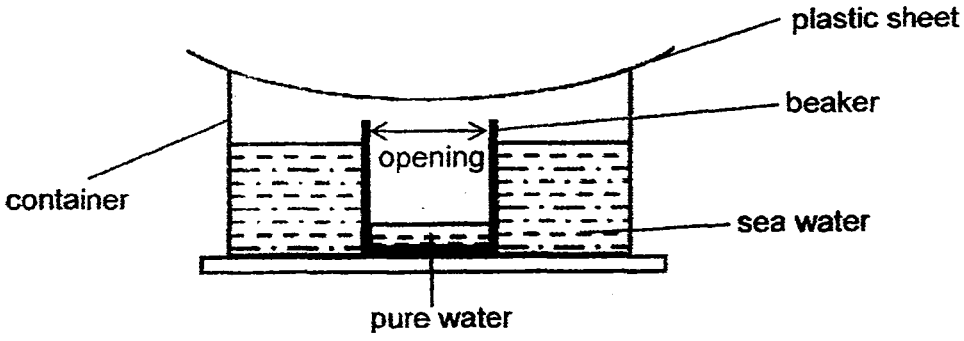
11. The diagram below shows a water cycle.



How many time does water undergo a change of state in 1 complete cycle?

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

12. Jason made use of the set-up below to collect pure water in the beaker. He managed to collect 50ml of pure water in 1 hour.



Which of the following methods would enable him to collect **more** water in the beaker within 1 hour?

A Heat up the sea water.
B Use a beaker with a smaller opening.
C Pour more sea water into the container.
D Place some ice cubes on top of the plastic sheet.

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

13. Martin carried out an investigation on four similar flowers, A, B, C and D, to find out if a fruit can be developed when certain parts of a flower are removed. The four flowers contain both male and female parts.

In the table below, a cross (X) in the box indicates that the part had been removed from each of the flowers.

	Flower			
	A	**B**	**C**	**D**
Petals	X		X	X
Male parts	X			
Female parts		X		X

Which flower(s) will still be able to become a fruit if it is pollinated?

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

14. The diagram below shows plant A in the park. Tom made some notes in his diary after observing plant A.

Plant A

Notes in his diary:
- green leaves
- spore bags

Which of the following statements are **true** about plant A?

A It produces fruits.
B It is not able to produce flowers.
C It is able to carry out photosynthesis.
D It disperses its spores with the help of insects or animals only.

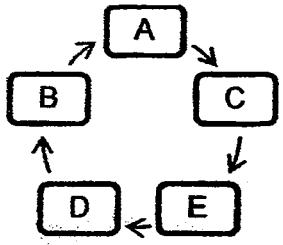
(1) A and C only
(2) A and D only
(3) B and C only
(4) B, C and D only

15. The statements below describe the stages of the sexual reproduction in a flowering plant.

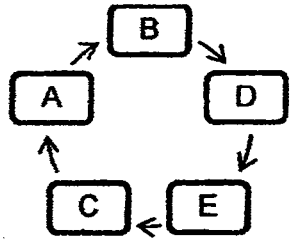
A	The ovules develop into seeds.
B	The anther releases pollen grains.
C	The pollen grains land on the stigma.
D	The male cell from the pollen grain travels to the ovary.
E	The male cell of the pollen grain fuses with the female cell.

Which one of the following diagrams shows the stages in the correct order?

(1)



(2)



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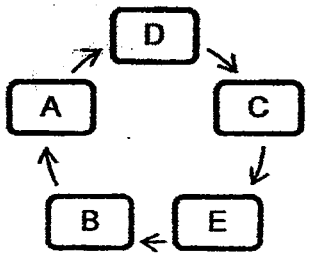
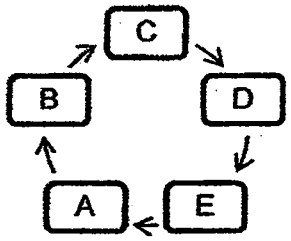
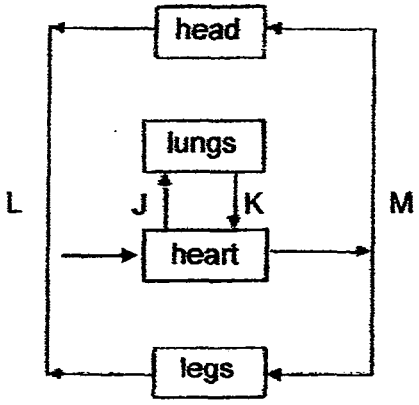


(4)



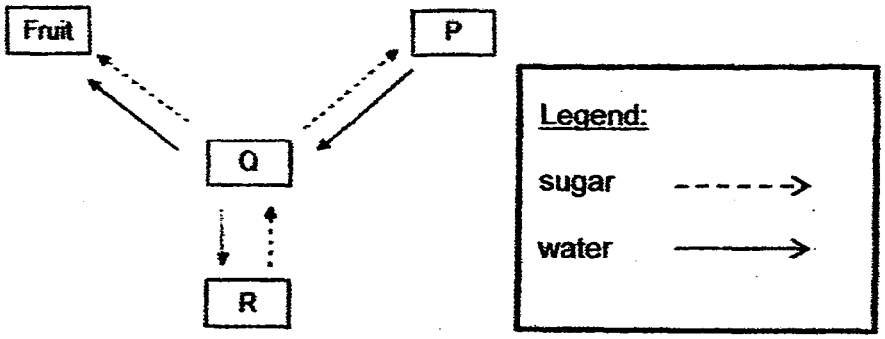
16. The diagram below represents the human circulatory system. The arrows represent blood vessels carrying blood to and from the head, lungs, heart and legs.



Which one of the following correctly matches the amount of oxygen in the blood with the blood vessels that are carrying it?

	More oxygen in the blood	Less oxygen in the blood
(1)	J and K	L and M
(2)	J and M	K and L
(3)	K and M	J and L
(4)	K and L	J and M

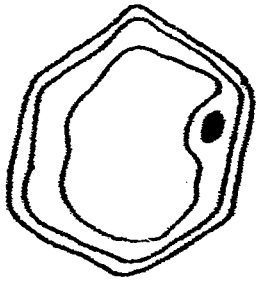
17. The diagram below shows how sugar and water are transported to and from different parts of a plant.



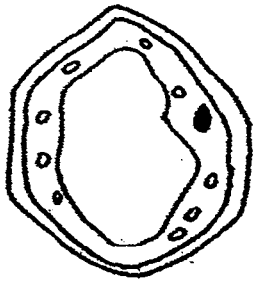
Which one of the following correctly shows the parts of the plant that are represented by P, Q and R?

	P	Q	R
(1)	stem	leaves	roots
(2)	roots	stem	leaves
(3)	roots	leaves	stem
(4)	leaves	roots	stem

18. Four pupils, A, B, C and D, examined the following two types of cells, X and Y, under a microscope.



Cell X



Cell Y

They recorded their observations in a table as shown below.

A tick (✓) indicated the presence of the cell part.

Pupil	Cell	Cell wall	Cytoplasm	Cell membrane	Chloroplast
A	X		✓		✓
B	Y	✓		✓	✓
C	X	✓	✓	✓	
D	Y	✓	✓	✓	✓

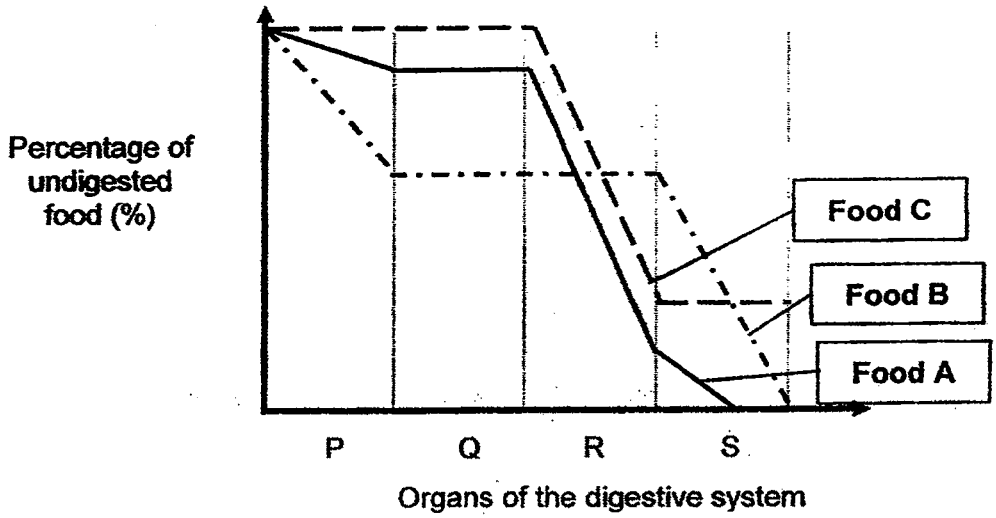
Which pupils had made the **correct** observations about the two cells, X and Y?

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

19. Some scientists wanted to study the digestive system of animal X. They fed animal X with the same amount of different food, A, B and C.

Animal X's digestive system was checked at each organ to find out how much of the food remains to be digested.

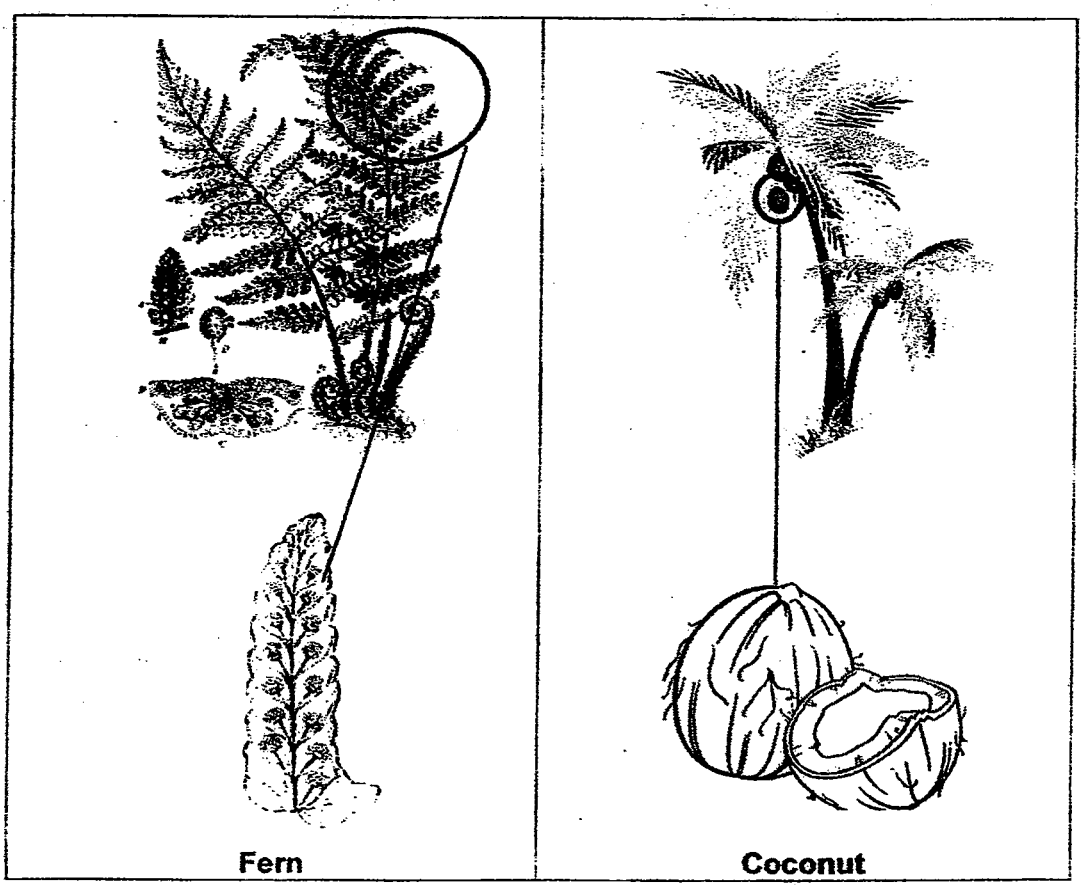
The results were plotted in the line graph as shown below.



Based on the above results, what can the scientists conclude at the end of the experiment?

(1) Organ R is the most effective at digestion.
(2) Food A is the most difficult to digest by Animal X.
(3) Each organ of the digestive system digests all three types of food.
(4) The type of food Animal X ate affects the rate of digestion of food.

20. The pictures below show two plants.

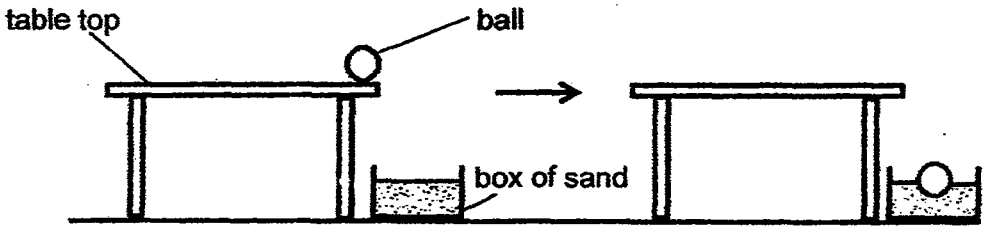


Which of the following statements are **true** about both plants?

A Both of them can produce flowers.
B Both of their leaves have chlorophyll.
C The fern has spores while the coconut has seeds.
D The fern may grow on trees while the coconut grows on soil.

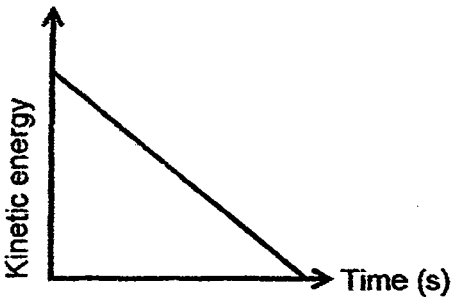
(1) A and C only
(2) B and D only
(3) A, B and C only
(4) B, C and D only

21. A ball was pushed off a table top and landed in a box filled with sand as shown in the diagram below.

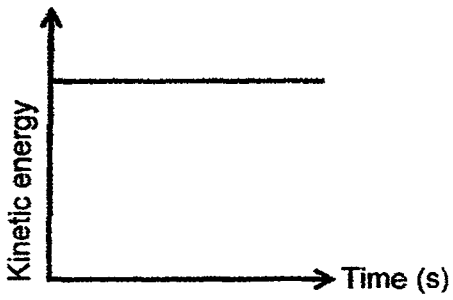


Which of the following graphs correctly shows how the kinetic energy of the ball changed from the time it was pushed off the table to the time it landed in the box of sand?

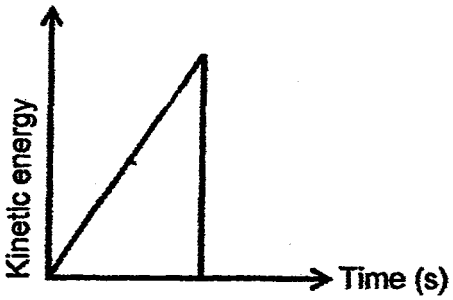
(1)



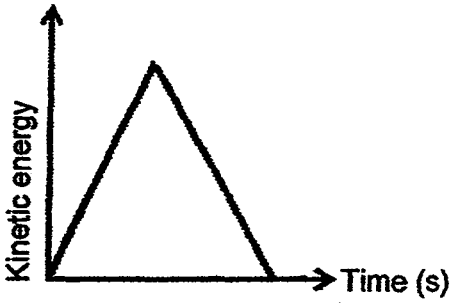
(2)



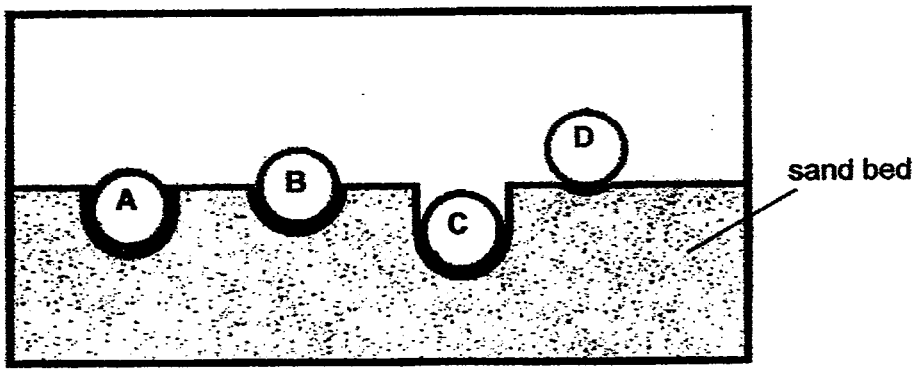
(3)



(4)



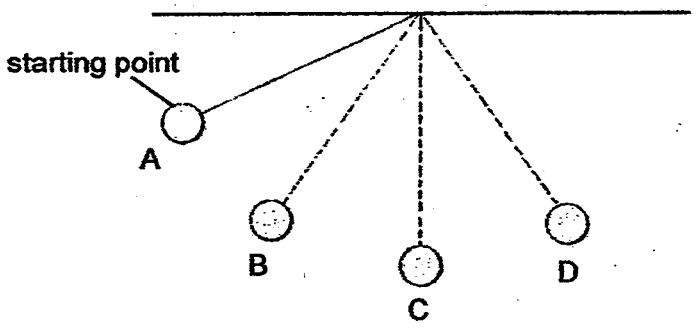
22. Four identical marbles were dropped from different heights and landed onto a sand bed as shown in the diagram below.



Which of the following shows the correct arrangement of the marbles based on the height from which they were dropped?

	Highest →			Lowest
(1)	A	B	C	D
(2)	B	C	A	D
(3)	C	A	B	D
(4)	D	B	A	C

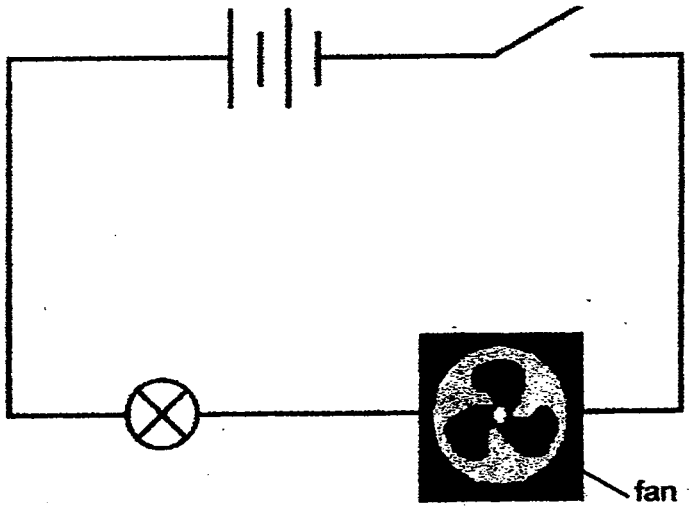
23. A pendulum was released from the starting point as shown in the diagram below.



At which point did the pendulum possess the most kinetic energy?

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

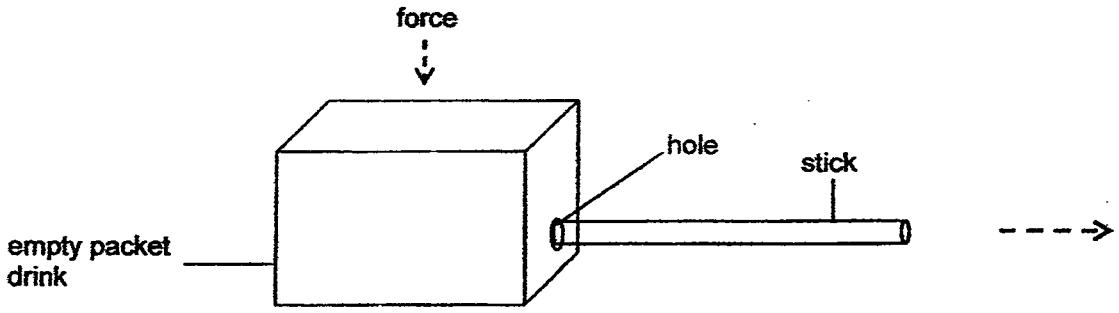
24. Study the set-up below.



Which of the following correctly shows the main energy conversion of the above set-up when the switch is closed?

	Battery		Wire		Bulb		Fan
(1)	Electrical energy	→	Electrical energy	→	Heat energy	+	Kinetic energy
(2)	Chemical potential energy	→	Electrical energy	→	Heat energy	→	Kinetic energy
(3)	Electrical energy	→	Electrical energy	→	Light energy	+	Heat energy
(4)	Chemical potential energy	→	Electrical energy	→	Light energy	+	Kinetic energy

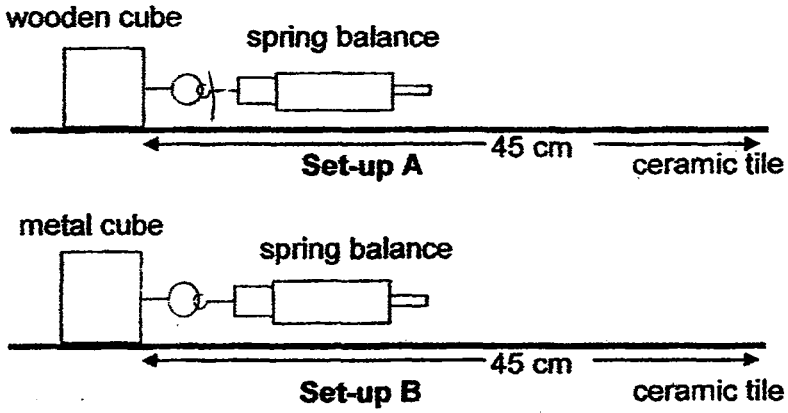
25. The diagram below shows an empty packet drink and a stick. When a force is applied on the empty packet drink, the stick pops out.



Which of the following statements can be concluded based on the experiment?

(1) The air in the packet expands and pushes the stick out.
(2) The air in the packet exerts a force on the stick and forces it out.
(3) The air outside the packet exerts a force on the stick and pulls it out.
(4) The hole in the packet becomes slightly bigger and pushes the stick out.

26. Mike carries out an experiment to find out how the type of surface affects the amount of force needed to move a wooden cube over a certain distance as shown in the set-ups below.



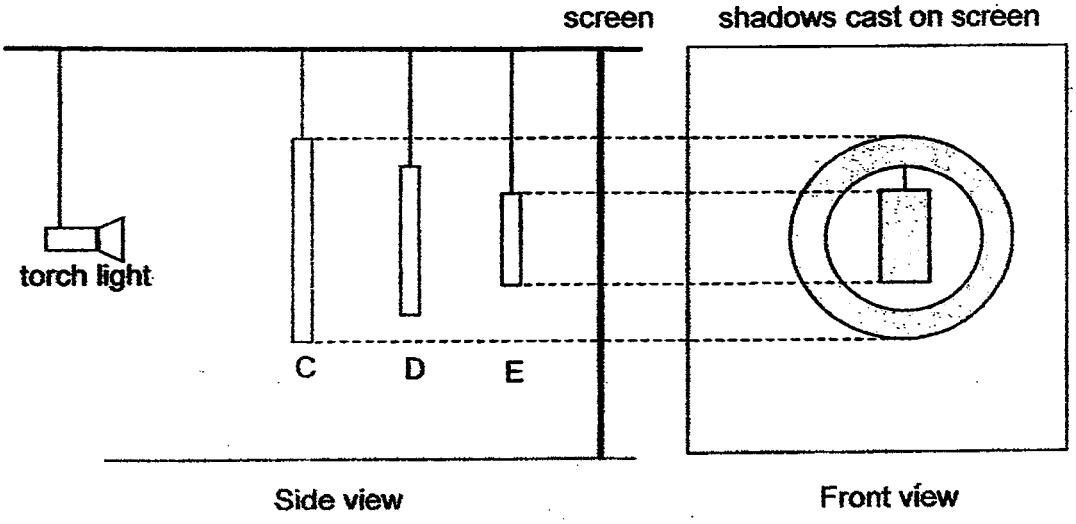
However, he was told that he should change two of the variables in set-up B.

Which one of the following shows the correct change in the two variables to be done in set-up B?

	Variable 1	Variable 2
(1)	Remove spring balance	Use a shorter distance of 35 cm
(2)	Change metal cube to a wooden cube	Replace ceramic tile with sandpaper
(3)	Use a smaller metal cube	Use a shorter distance of 35 cm
(4)	Remove spring balance	Replace ceramic tile with sandpaper

27. Justin used 3 different materials, C, D and E, to make 3 cut-outs of different shapes and heights but of the same thickness.

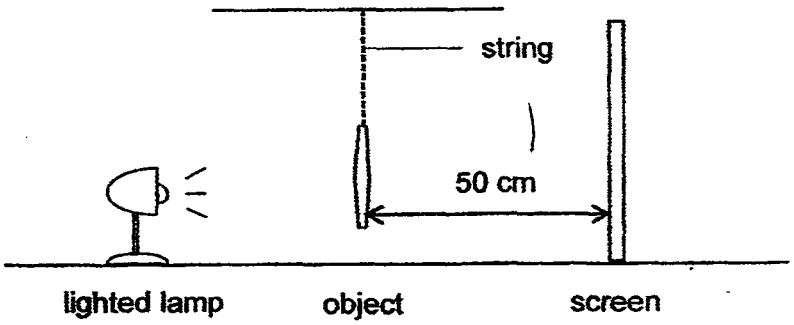
He hung the 3 cut-outs from a support between a screen and a torchlight. When he switched on the torchlight, the shadows cast on the screen are shown below.[The diagrams are drawn to scale]



Which one of the following best represents the materials, C, D and E, based on the observation of the shadows formed on the screen?

	Material C	Material D	Material E
(1)	cardboard	wood	tracing paper
(2)	wood	clear glass	aluminium
(3)	iron	cardboard	frosted glass
(4)	clear plastic	frosted glass	clear glass

28. The following experiment was set in a darkened room.



The distance between the lighted lamp and the object remained unchanged. The distance between the object and the screen was changed and the size of the shadow on the screen was measured.

Which one of the following results shows the correct relationship?

(1)

Distance between object and screen (cm)	Size of shadow of object (cm)
50	55
100	68
150	81

(2)

Distance between object and screen (cm)	Size of shadow of object (cm)
50	81
100	68
150	55

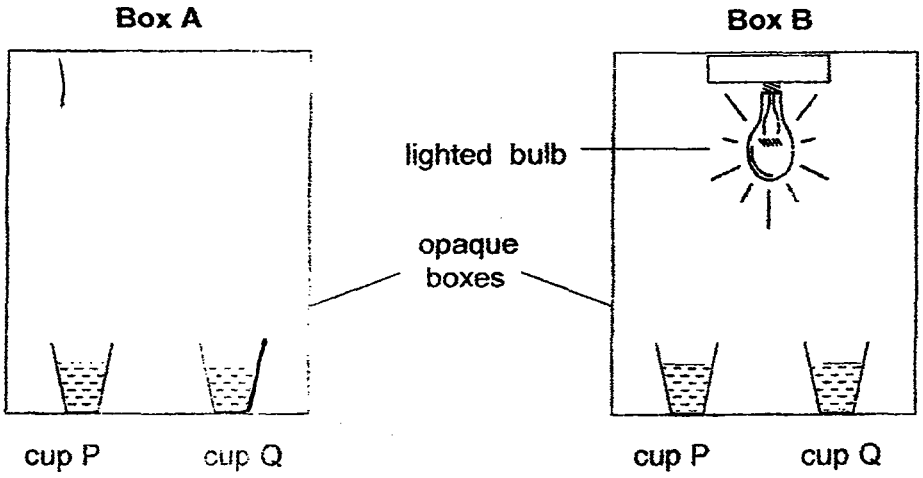
(3)

Distance between object and screen (cm)	Size of shadow of object (cm)
50	68
100	68
150	68

(4)

Distance between object and screen (cm)	Size of shadow of object (cm)
50	81
100	55
150	68

29. An experiment was conducted using 2 opaque boxes, A and B, as shown below. Box B had a bright bulb attached to the top. There were 2 open cups in each box. The cups were made of 2 different materials, P and Q. The 4 cups were each filled with 20ml of water at 1°C and left in the boxes for 6 hours at room temperature in a room.



The amount of water left in each cup was then compared and recorded in the table as shown below.

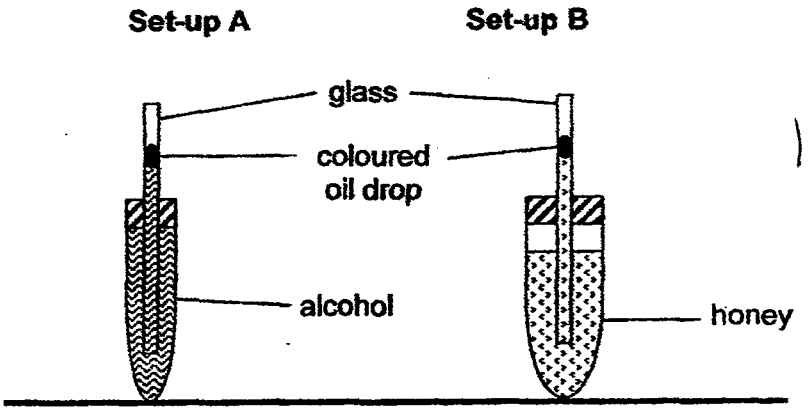
Box A		Box B	
Amount of water left in cup P (ml)	Amount of water left in cup Q (ml)	Amount of water left in cup P (ml)	Amount of water left in cup Q (ml)
19	19.5	16	18

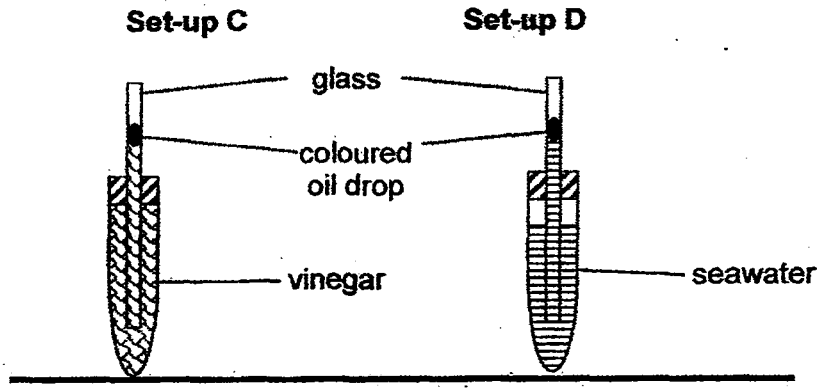
Which of the following statements about the above experiment are **correct?**

A Cup P is a better conductor of heat than Cup Q.
B Cup Q in box A conducts more heat than Cup Q in box B.
C Water in cup P in box B has gained the most heat from the surroundings as compared to the other 3 cups.

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

30. Samantha wanted to conduct an experiment to find out which liquid expanded the most when heated.





In order to conduct the experiment, Samantha planned to heat the set-ups over a bunsen burner and note the time taken for the coloured oil drop to move 5cm up the glass tube.

Which two of the above set-ups should she use to ensure a fair test?

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

PRIMARY 6 SCIENCE

SEMESTRAL ASSESSMENT 1
2016

BOOKLET B

Date : 4th May 2016

Duration : 1 h 45 min

Name : _____ ( )

Class: Primary 6 ( )

Marks Scored:

Booklet A:		60
Booklet B :		40
Total :		100

Any query on marks awarded should be raised by 18th May 2016. We seek your understanding in this matter as any delay in the confirmation of marks will lead to delays in the generation of results.

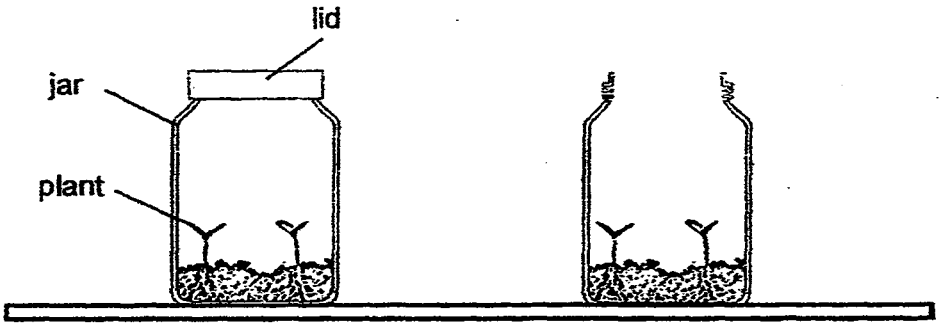
Parent's signature: .....

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.
FOLLOW ALL INSTRUCTIONS CAREFULLY.

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

Section B (40 marks)
Write your answers to questions 31 to 44 in the spaces provided.

31. Jason grew similar plants in two different clear glass jars as shown in the diagram below.



The plants in both jars were watered with the same amount of water before placing them near the window. After a few weeks, the plants in one of the jars died.

(a) Which jar most likely contained the plants that died? Explain your answer. [1]

_____

_____

_____

Two similar seeds were planted in a similar jar wrapped with a sheet of black paper. 50ml of water was poured into the jar before closing the lid. After a week, it was observed that the seedlings which had germinated from the seeds had died.

(b) Explain why the seedlings died after a week. [1]

_____

_____

_____

32. A group of pupils studied the development of eggs of fish S. They placed 50 fertilised eggs in each fish tank. The water in each fish tank was kept at different temperature. The eggs were observed for a month and the number of hatched eggs in each fish tank was recorded in the table as shown below.

Fish tank	Temperature of water (°C)	Number of hatched eggs
1	20	0
2	22	5
3	24	21
4	26	47
5	28	15
6	30	9
7	32	0

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

_____

_____

(b) Based on the results above, state the relationship between the temperature of water and the number of hatched eggs. [2]

_____

_____

_____

33. The food chain below shows the relationship of two organisms in a habitat.

Grass ⟶ B

The graph below shows the area of grass found in the habitat in the first six months.

(a) Organism C was introduced into the habitat after some time and the population of B decreased over time. **Mark with an 'X'** on the graph above to show when organism C was introduced to the habitat. [1]

(b) State the food relationship between organisms B and C. [1]

_____

_____

(c) Organism D was then introduced into the habitat. It feeds on organism B only. Explain how this would affect the populations of grass and organism B. [2]

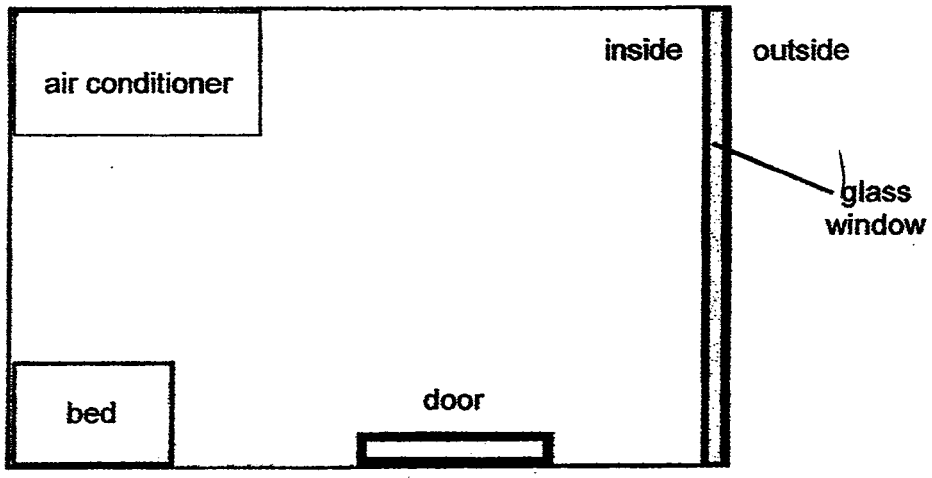
_____

_____

_____

_____

34. The diagram below shows the layout of Tom's room. The air-conditioner is used to keep the room cool.



Tom switched on the air-conditioner before he went to bed. He observed that there were tiny droplets of water on the glass window the next morning.

(a) Did the water droplets form on the inside or outside of the glass window? Explain your answer [2]

_____

_____

_____

(b) Without switching off the air conditioner and using only items found in the room, suggest a method to reduce the amount of water droplets forming on the glass window. Explain your answer. [2]

Method:

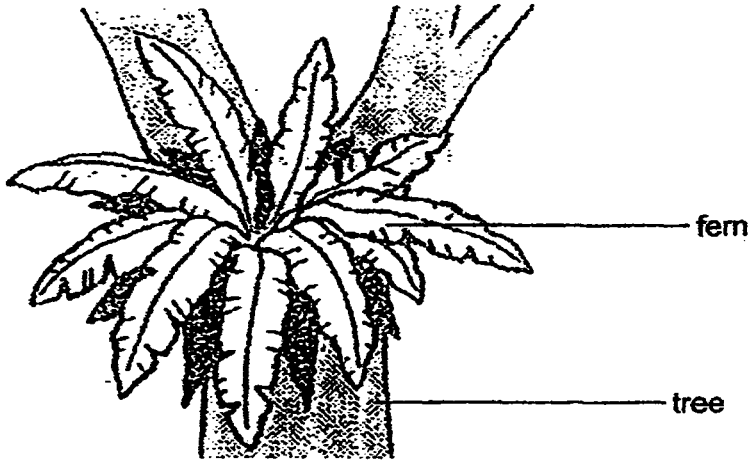
_____

Explanation:

_____

_____

35. Yuxuan noticed that a fern had grown on the big tree outside his school after a few months.



(a) How did the fern manage to grow on the tree? [1]

_____

_____

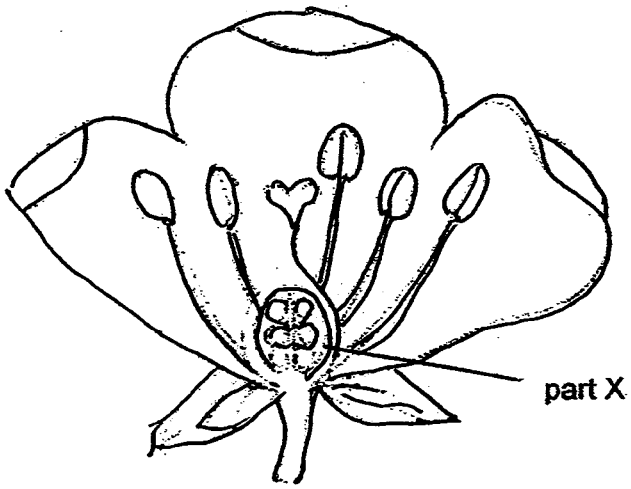
(b) Explain how the tree is useful for the fern to grow well. [1]

_____

_____

_____

36. The diagram below shows the cross-section of flower Y.



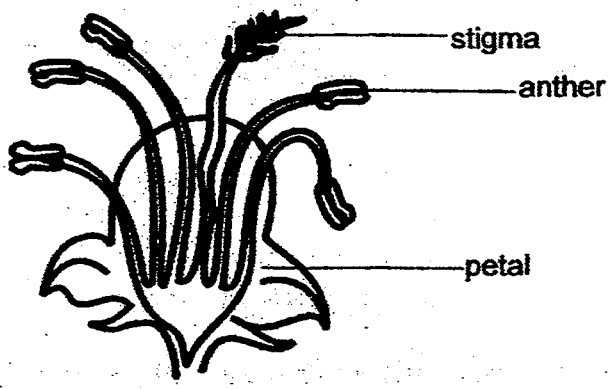
Flower Y

(a) It was observed that flower Y developed into a fruit even after its male parts had been removed. Explain how this was possible. [1]

_____

_____

(b) The diagram below shows the cross-section of flower Z.

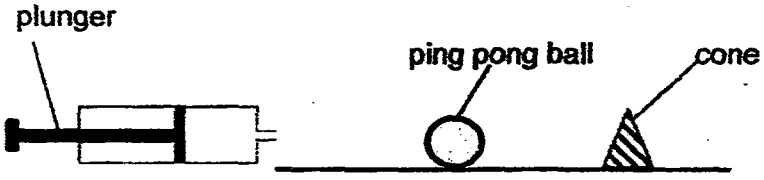


Flower Z

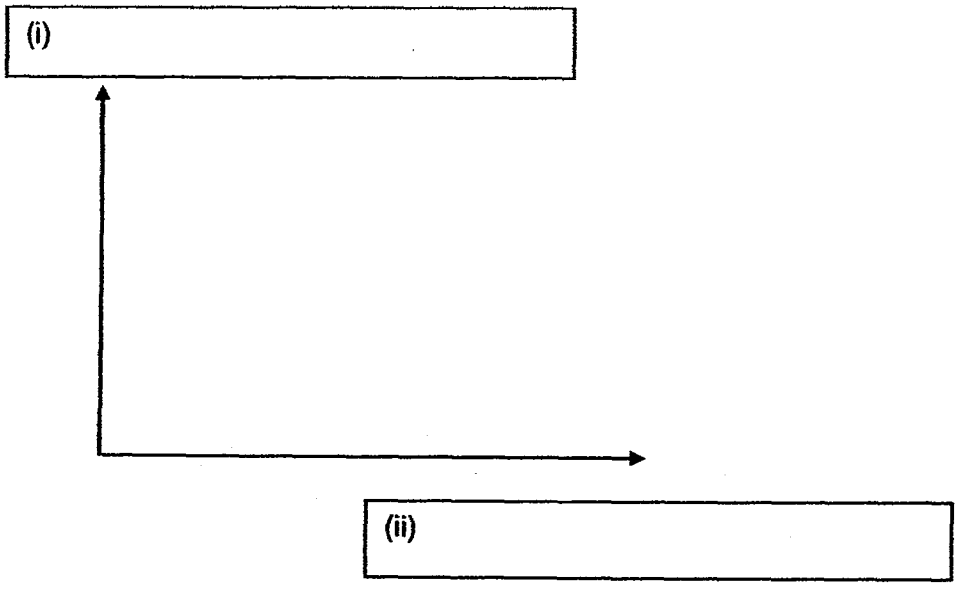
Based on the diagram above, state **one** characteristic of flower Z to show that it is pollinated by wind. [1]

_____

37. Luke conducted an experiment using a syringe to push air out when the plunger is pushed in. The force exerted by the air from the syringe would cause the ping pong ball to move along the table and hit a cone. He then measured the distance moved by the cone. The experiment was repeated by pulling the plunger to different distances.



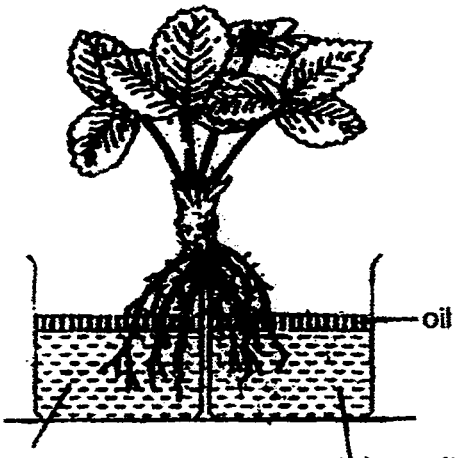
(a) In the incomplete graph below, **fill in** the boxes for the 2 axes **and draw a line graph** to show the relationship between the force of air on the ball and the distance travelled by the cone when hit by the ping pong ball. [2]



(b) Explain why the experiment must be repeated at least 3 times for each distance. [1]

_____

38. Study the diagram below.



Half of the roots of the plant were placed in each container which contained a red dye solution and clear water respectively. The set-ups were placed in an open area for 2 days.

(a) Describe and give a reason for the change in the amount of water in the 2 containers after 2 days. [1]

_____

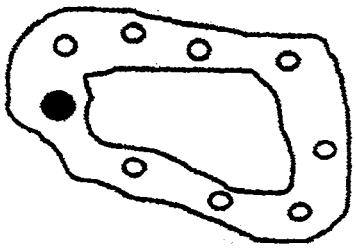
_____

(b) It was observed that the stem and leaves of the plant turned red. Explain how these parts turned red. [1]

_____

_____

39. The diagram below shows cell X which is from a plant. One part had been removed from the cell.



Cell X

(a) State the cell part which had been removed. State the function of that cell part. [1]

_____

_____

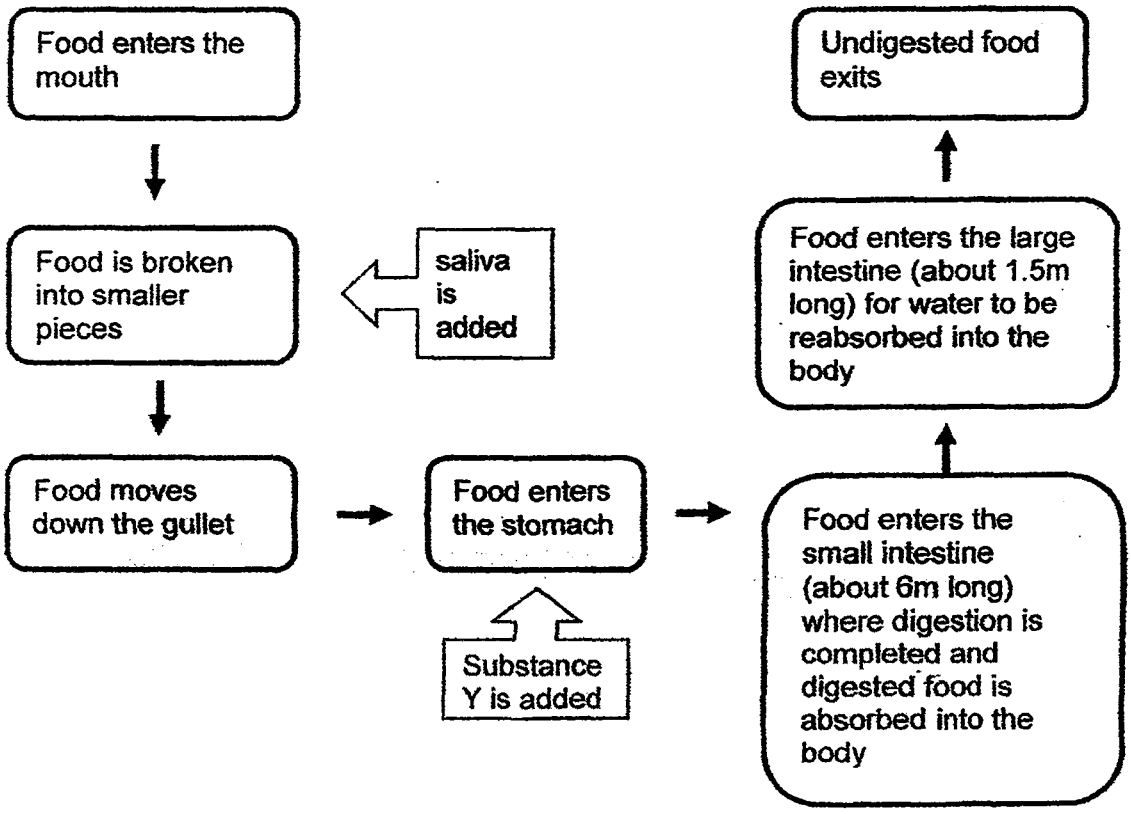
(b) Tom's teacher used the nucleus from cell X to confirm that the cell came from a plant.

State the function of the nucleus which enables him to do so. [1]

_____

_____

40. Study the following flow chart carefully.



(a) Identify substance Y and state its function in the digestion of food in the stomach. [2]

Substance Y: _____

Function: _____

_____

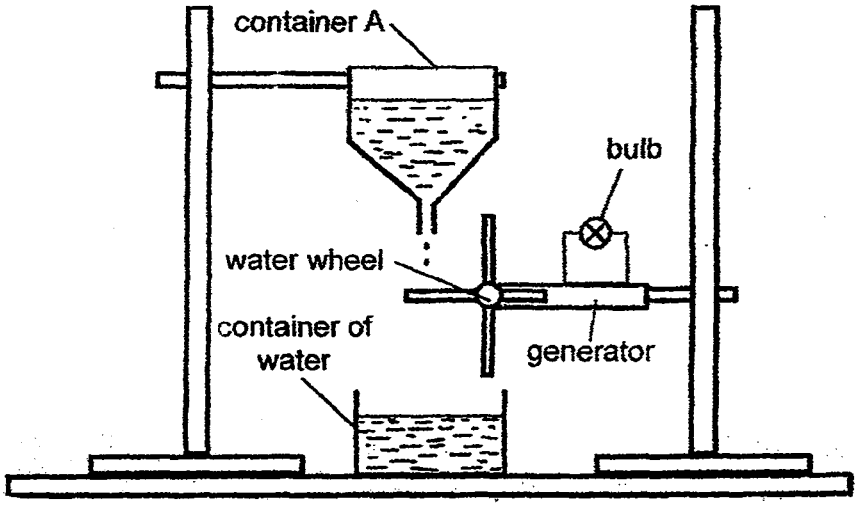
(b) Based on the above flowchart, explain in terms of their function in the digestive system, why the small intestine is much longer than the large intestine? [1]

_____

_____

_____

41. Study the set-up below. When the water dripped from container A, the water wheel would spin and the generator would generate energy for the bulb to light up.



(a) Using the concept of energy conversion, describe how the water in container A enabled the bulb to light up. [2]

_____

_____

_____

_____

(b) Using the same items in the set-up, suggest and explain one modification to the set-up to enable the bulb to light up more brightly. [2]

Method:

_____

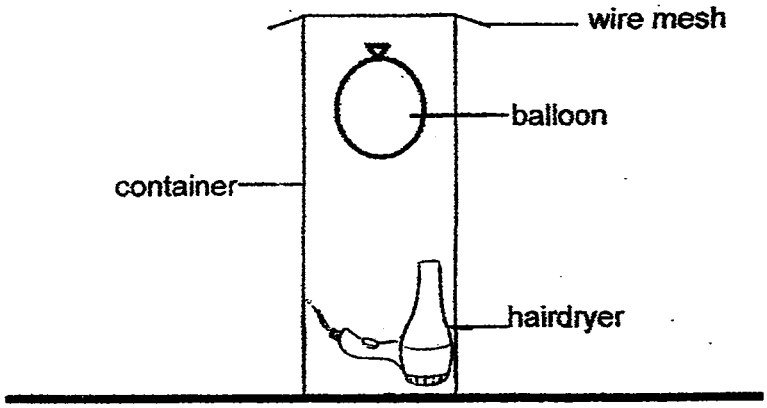
_____

Explanation:

_____

_____

42. A hair dryer was used to blow a balloon to keep it suspended in the air as shown below.



The height of the balloon from the ground was measured and the results were recorded in the table below.

	Height of balloon (cm)			
Speed of hair dryer	1st reading	2nd reading	3rd reading	Average reading
Low	33	34	32	33
Medium	42	40	44	42
High	57	50	55	54

(a) What is the relationship between the speed of the hair dryer and the height of the balloon? [1]

_____

_____

(b) State 2 forces that were acting on the balloon while it was suspended in the air. [1]

_____

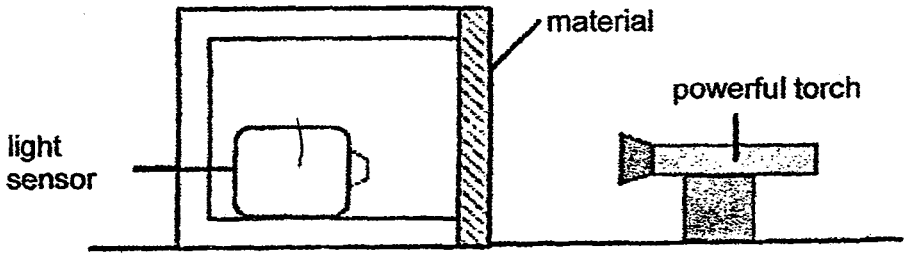
_____

(c) When the balloon is blown at low speed for 4 minutes, it bursts. Explain clearly why this happens. [1]

_____

_____

43. Anne set up the experiment as shown below. She covered the open side of a darkened box with material A and then recorded the amount of light detected by the light sensor.



She repeated the experiment using materials B and C of the same thickness as material A. The table below shows her results.

Materials	Light detected by light sensor (lux)
A	50
B	240
C	120

(a) Based on the set-up above, state the aim of Anne's experiment. [1]

_____

_____

(b) Why did Anne ensure that the materials were of the same thickness each time she carried out the experiment? [1]

_____

_____

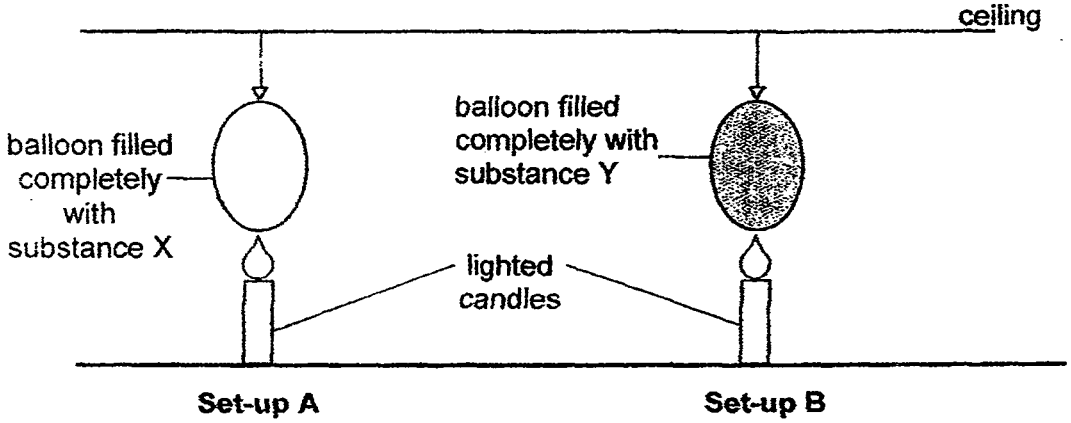
Anne works the night shift. When she returns home after work in the morning, she wants to make her environment as dark as possible while she sleeps.

(c) Which material, A, B or C, should she use to make curtains for her windows? Give a reason for your answer. [1]

_____

_____

44. Steve wanted to test the properties of substances X and Y. He set up the experiment as shown below in the Science laboratory. He placed 2 balloons of the same type, one completely filled with substance X only and the other completely filled with substance Y, and hung them over a candle flame. He lit the candle and observed what happened.



He recorded the time taken for the balloon to burst in the table below.

Set-up	Time taken for balloon to burst (s)
A	10
B	120

(a) Based on the results above, what can he conclude about the property of substance Y as compared to substance X? [1]

_____

_____

(b) Explain the difference in the time taken for the balloons to pop in the 2 set-ups above. [2]

_____

_____

_____

_____

END.

Nanyang Primary School
Primary 6 Science SA1 2016

Section A

1	3	**6**	1	**11**	2	**16**	3	**21**	3	**26**	2
2	2	**7**	3	**12**	3	**17**	2	**22**	3	**27**	2
3	2	**8**	1	**13**	2	**18**	2	**23**	3	**28**	1
4	1	**9**	1	**14**	3	**19**	4	**24**	4	**29**	2
5	4	**10**	3	**15**	4	**20**	4	**25**	2	**30**	1

Section B

31 a Jar B. Plants can produce their own oxygen by photosynthesizing and carbon dioxide from respiration. However, unlike in Jar A, where water can be trapped, the water in Jar B would evaporate and the plant in B will have insufficient water for photosynthesis.

b The seedlings used the stored food in the seed leaves for germination before true leaves develop and upon using up the stored food, the seedlings must take in sunlight to make food to survive. However as the black paper blocks out sunlight necessary for photosynthesis, the seedlings will die after a week after all the stored food are used up and the plant cannot photosynthesize.

32 a To find out how the temperature of water affects the number of hatched eggs in the fish tank.

b The higher the temperature, the greater the number of hatched eggs until 26°C. Beyond 26°C, the higher the temperature, the smaller the number of hatched eggs.

33 a mark 'X' towards the left of the lowest point in the graph

b C is the predator of B.

c As B is D's only food source, the population of B would decrease when D was introduced to the habitat. As B eats grass, when the population of B decreases, the grass population will increase as lesser B feeds on the grass.

34 a Water droplets formed on the outside of the glass window. As the room is kept cool by the air conditioner, the glass window surface is cooler than the external air. The warmer water vapour in the air outside the window will come into contact with the cooler outer surface of the glass window and condense to form water droplets.

b Method: Set the air-conditioner to a higher temperature
Explanation: With a higher temperature, the temperature difference between the glass window and the surroundings will not be as great as before thus less water vapour would lose heat to the glass window and condense on the glass window, forming less water droplets.

35 a The spores of the fern was carried by the wind onto the tree.

b The tree keeps the fern higher up the ground and allows the fern to obtain more sunlight for photosynthesis to make food.

36 a Pollen grains from another flower of the same species can land on the stigma of flower Y to allow pollination and fertilization to occur, hence part X can still develop into a fruit.

b The anther is hanging outside the flower, allowing wind to carry pollen grains to the stigma of other plants.

37 a (i) Distance travelled by the cone (cm)
(ii) Force of air on the ball (newtons)
b To ensure that the results of the experiment are reliable.

38 a The plants' roots take in water from the container (for photosynthesis), causing the change in the amount of water in the container.
b The red dye solution was absorbed by the roots and transported by the water-carrying tubes to the stem and leaves.

39 a Cell wall had been removed. Cell wall gives the cell a regular shape.
b The nucleus contains the genetic information of the cell.

40 a Substance Y: Digestive juice
Function: Digestive juice breaks the food down into simpler substances.
b The small intestine allows food to be digested and facilitate the absorption of the digested food, hence the small intestine needs to be long enough for both complete digestion and absorption of digested food into the bloodstream to occur, while for the large intestine only water is to be reabsorbed into the body. Hence the small intestine needs to be longer to complete its function.

41 a The gravitational potential energy of the water in the water raised in container A is converted to kinetic energy of the moving water which falls onto the moving water wheel. The kinetic energy of the falling water is converted into the kinetic energy of the moving water wheel and is converted to electrical energy of the generator and light energy of the light bulb.
b Method: Shift container A to a greater height than in the set-up above.
Explanation: More gravitational energy will be converted to more kinetic energy of the water and then to more kinetic energy of the water wheel that will be converted to more electrical energy of the generator to more light energy to cause the bulb to light up more brightly.

42 a The higher the speed of the hair dryer, the greater the height of the balloon.
b Gravitational force and frictional force
c When the air in the balloon gains heat from the hot air blowing out of the hairdryer, the air in the balloon expands and as it expands beyond the maximum volume of the balloon, the balloon will burst.

43 a To find out how the different materials will affect the amount of light detected by the light sensor.
b To ensure a fair test, only the material can be changed and all other variables should remain constant. As the thickness of the material can affect the light detected by the light sensor, the same thickness must be used so as to ensure a fair test.
c Material A as it allows the least light to pass through, allowing the room to be as dark as possible as least light can enter her home through the window.

44 a Substance Y is a better conductor of heat than X.
b Balloon A takes a shorter time to pop than Balloon B as Substance Y being a better conductor of heat will conduct heat from the lighted candle away from the balloon in set-up B more quickly than substance X in balloon A. This allows the balloon in set-up B to expand slower and pop slower than the balloon in A.

END