AI TONG SCHOOL

2014 MID-YEAR EXAMINATION
PRIMARY FIVE SCIENCE

DURATION: 1hr 45 min

DATE: 16 May 2014

INSTRUCTIONS

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

Name : _____ ( )

Class : Primary 5 _____

Parent's Signature : _____

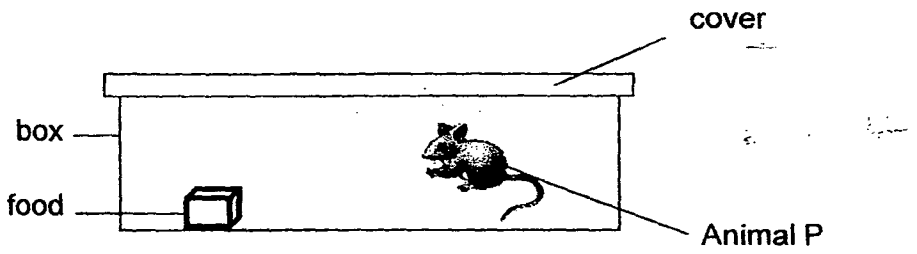
Date : _____

Section A	60
Section B	40
Total	100

Section A (30 x 2 marks)

For each question from 1 to 30, four options are given. One of them is the correct answer. Make your choice and shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet.

1. Jovan put Animal P into a box and gave it some food. He then covered the box tightly and left it near the window.



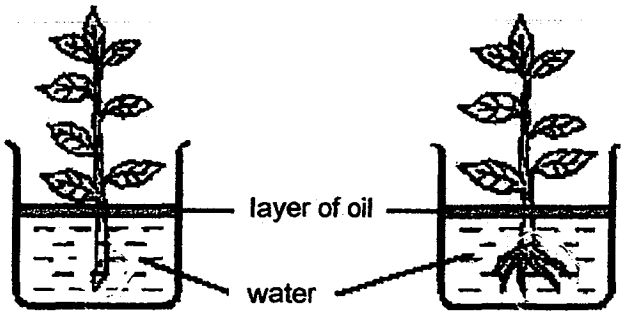
What should Jovan do to make sure that Animal P would still be alive the next day?

Jovan should _____.

A add more food
B poke a few holes in the cover
C place the container in a garden
D add another Animal P in the box

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

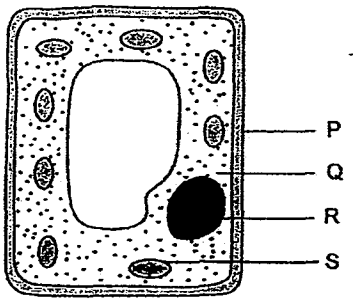
2. Mei Yen carried out an experiment as shown in the diagram below.



Based on the above set-up, what could the aim of her experiment be?

(1) To find out about the function of roots.
(2) To find out if water is needed for plant growth.
(3) To find out if plants can stay upright without roots.
(4) To find out about the effects of oil on plant growth.

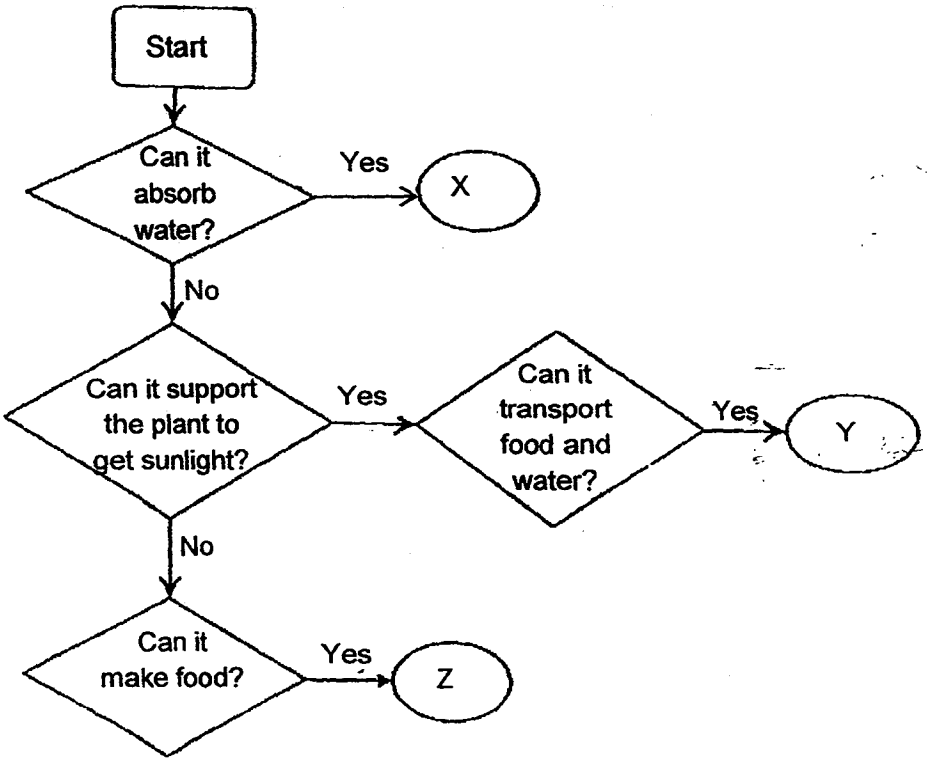
3. The diagram below shows a plant cell.



Which part of the cell, P, Q, R or S, must be present for the plant to be able to make food?

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

4. The flowchart below shows the functions of different plant parts X, Y and Z.



Which one of the following shows the correct plant parts for X, Y and Z?

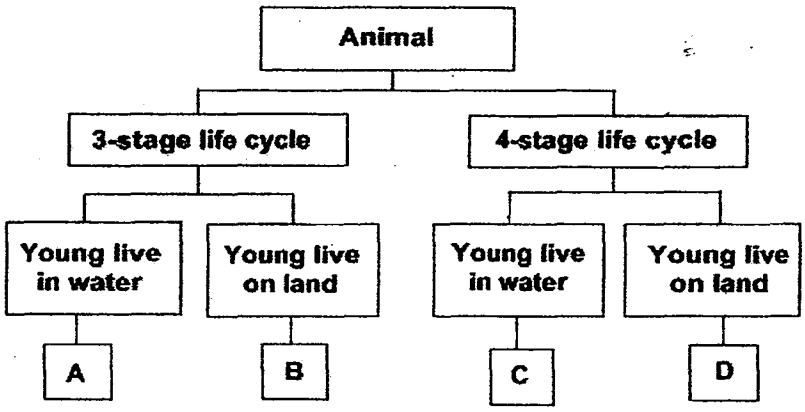
	X	Y	Z
(1)	Leaves	Roots	Stem
(2)	Roots	Leaves	Stem
(3)	Roots	Stem	Leaves
(4)	Stem	Roots	Leaves

3

5. The table below gives information about the life cycle of animals P and Q.

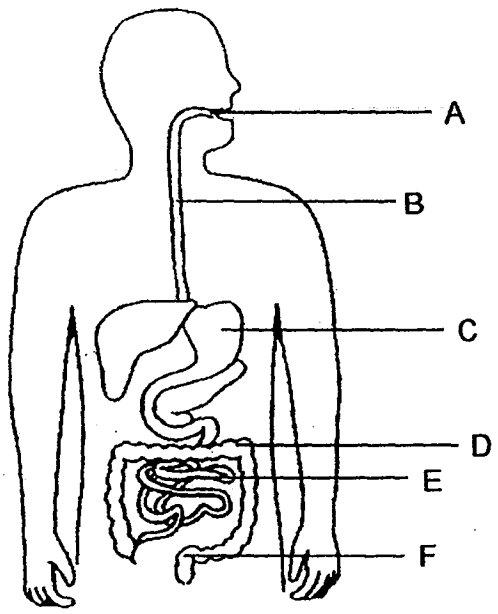
Description	Animal P	Animal Q
It has three stages in its life cycle.	√	X
The young lives in water.	√	X

From the information given, in which boxes, A, B, C or D, of the chart below do Animals P and Q belong to?



	Animal P	Animal Q
(1)	A	B
(2)	A	D
(3)	B	C
(4)	B	D

6. The diagram below shows the human digestive system.



In which parts, A, B, C, D, E and F, are digestive juices added?

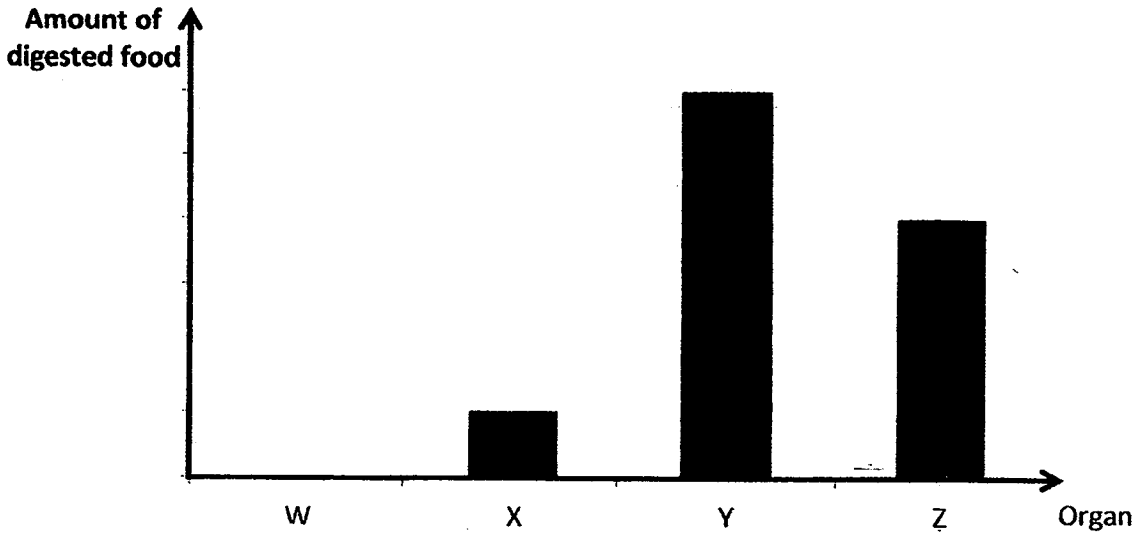
(1) A and C only
(2) D and E only
(3) A, C and E only
(4) C, D and E only

7. Which of the following statements are true about the large intestine of a human being?

A It contains digestive juices.
B Most of the food is digested here.
C Water is absorbed from the undigested food.
D The undigested food is passed into the rectum.

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

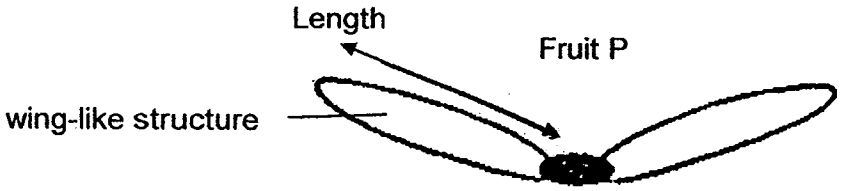
8. The graph below shows the amount of digested food found at different organs, W, X, Y and Z, in the human digestive system.



Based on the information shown in the graph above, which of the following is most likely to be organ X?

(1) Mouth
(2) Stomach
(3) Small intestine
(4) Large intestine

9. Pravitha wanted to find out if the length of the wing-like structures of Fruit P affects the distance it can travel. She carried out an experiment by dropping Fruit P from a certain height.

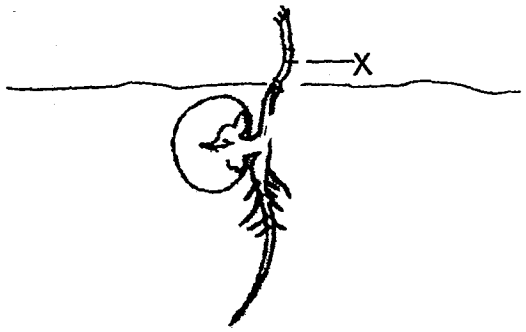


Which of the following variables did she have to keep constant in the experiment to ensure a fair test?

A Duration the fruit was in the air
B Height from which the fruit was dropped
C The length of the wing-like structure of the fruit
D The place at which the experiment is carried out

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

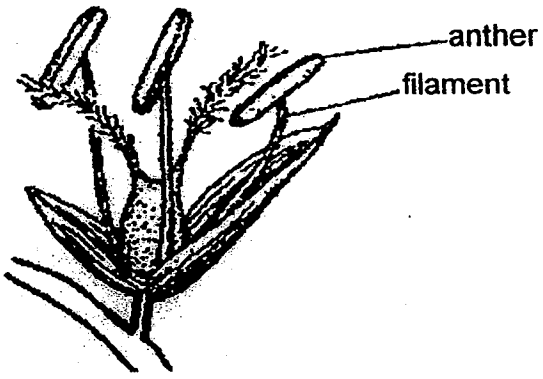
10. The diagram below shows a seedling.



What is the direction in which food and water are being transported at X?

	Direction for transport of	
	food	water
(1)	upwards	upwards
(2)	upwards	downwards
(3)	downwards	downwards
(4)	downwards	upwards

11. The diagram below shows a flower which has its anthers and filaments sticking out. It is still attached to the plant.



If all the anthers and filaments of the flower were removed, which of the following statements is/are **incorrect**?

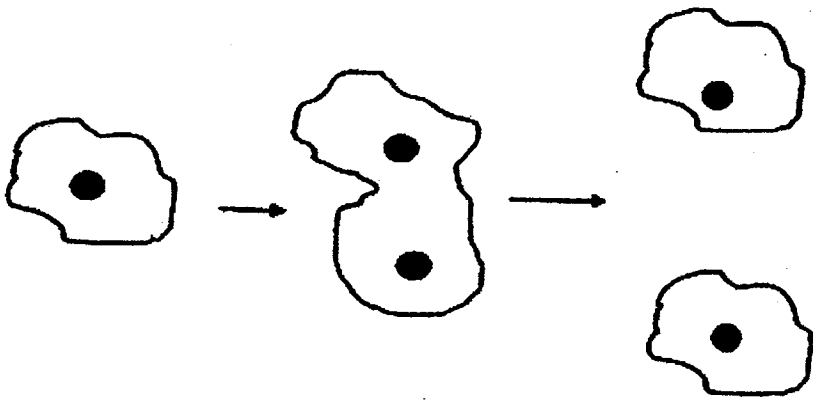
A The flower can still be pollinated.
B The ovary of the flower cannot become a fruit.
C This flower cannot produce any more pollen grains.
D The pollen grains will be transferred to this flower by insects.

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

12. An amoeba had its nucleus removed. It was not damaged but it died within hours.

died

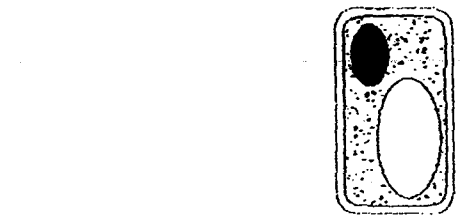
Another similar amoeba that did not have its nucleus removed was also observed for the same period of time. It continued to feed and move and could reproduce once.



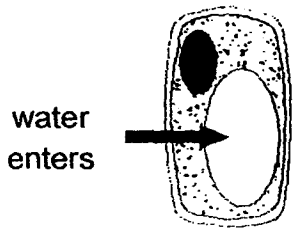
What conclusion can be made from the above observation?

(1) The nucleus is the part of the amoeba that feeds.
(2) The nucleus is needed by the amoeba to stay alive.
(3) The nucleus is needed by the amoeba for movement.
(4) The nucleus is the part that contains hereditary material.

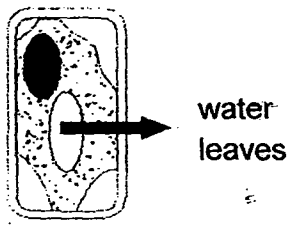
13. The diagram below shows a plant cell.
Diagram A shows the same plant cell when water enters it.
Diagram B shows the same plant cell when water leaves it.



plant cell



A



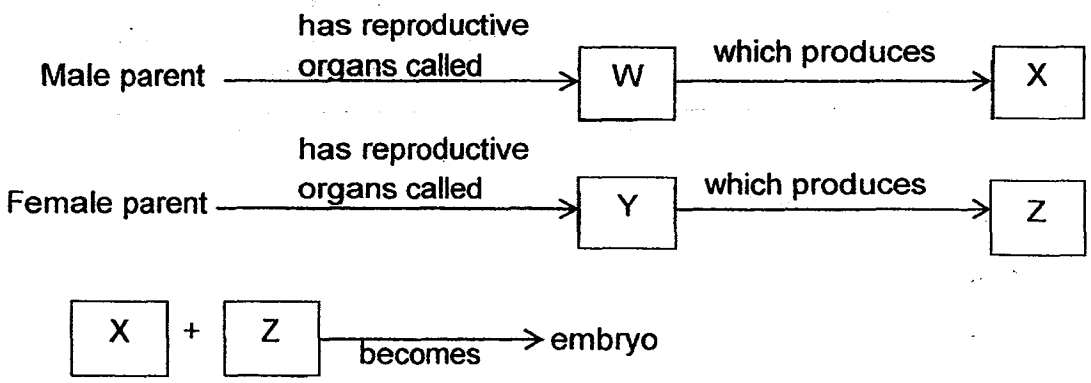
B

Based on the above information, which of the following is a correct observation of the cell wall?

A The cell wall cannot protect the cell.
B The cell wall allows water to pass through it.
C The cell wall supports and gives the cell a regular shape.
D The cell wall controls the movement of water in and out of the cell.

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

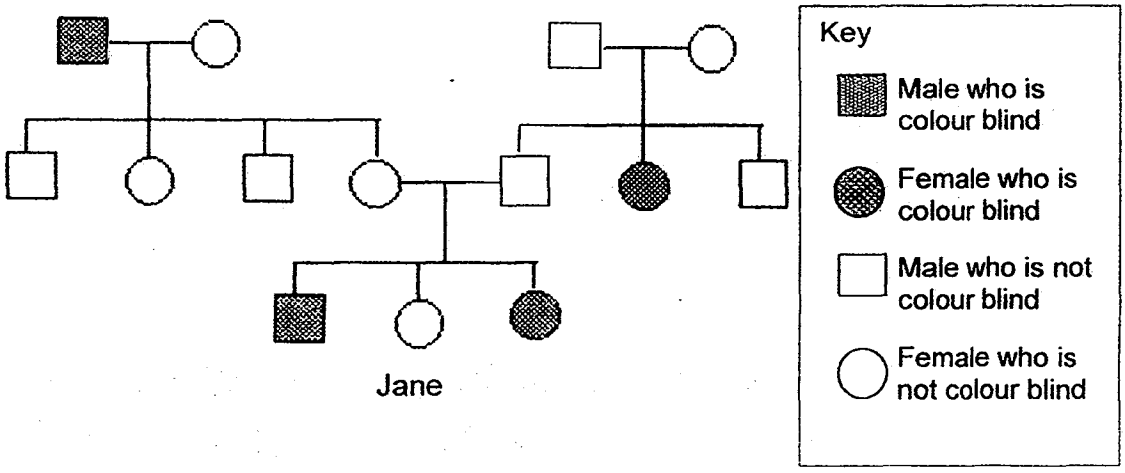
14. The diagram below shows how fertilisation takes place in animal reproduction.



What are W, X, Y and Z?

	W		Y	Z
(1)	Penis	Sperm	Testes	Egg
(2)	Anther	Pollen	Ovaries	Egg
(3)	Testes	Sperm	Ovaries	Egg
(4)	Testes	Penis	Style	Ovaries

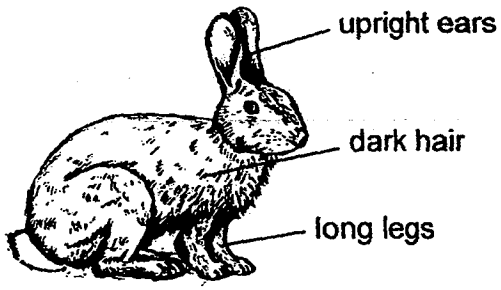
15. Study the family tree of Jane below. The family tree shows the members of her family who are either colour blind or not colour blind.



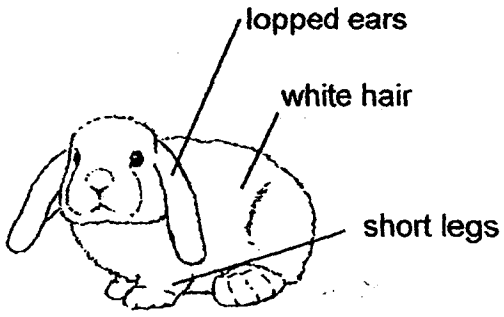
Which one of the following statements about the family tree is correct?

(1) Jane's parents are colour blind.
(2) Jane has one brother who is colour blind.
(3) Both Jane's grandfathers are colour blind.
(4) Jane's father has no brothers or sisters who are colour blind.

16. The diagram below shows rabbits K and L.

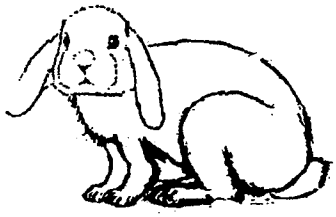


Rabbit K



Rabbit L

Rabbits K and L bred and reproduced Rabbit M as shown below.

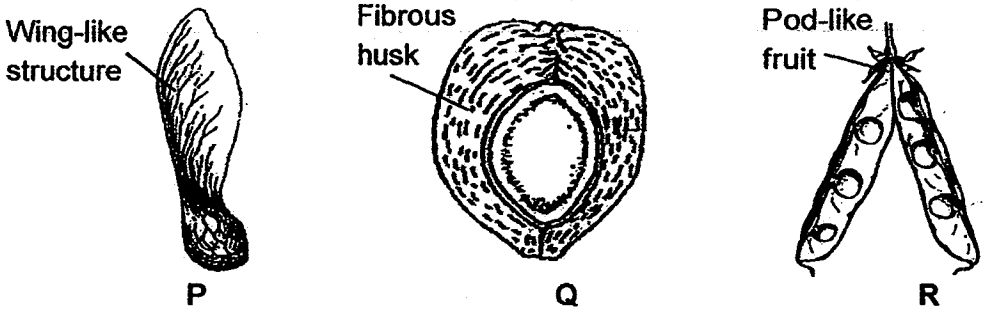


Rabbit M

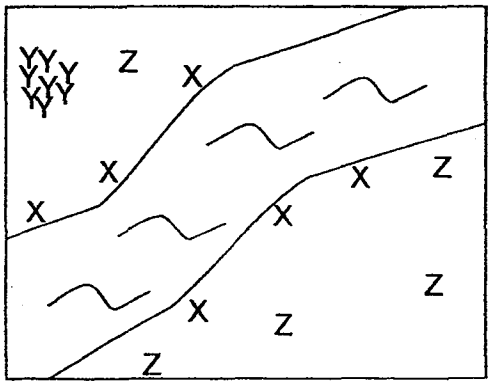
Which of the following correctly shows from which parent, Rabbit K or L, did Rabbit M inherit its characteristics?

	Rabbit K	**Rabbit L**
(1)	long legs	white hair and lopped ears
(2)	white hair and long legs	lopped ears
(3)	dark hair and upright ears	short legs
(4)	white hair and lopped ears	long legs

17. The picture below shows three fruits, P, Q and R.



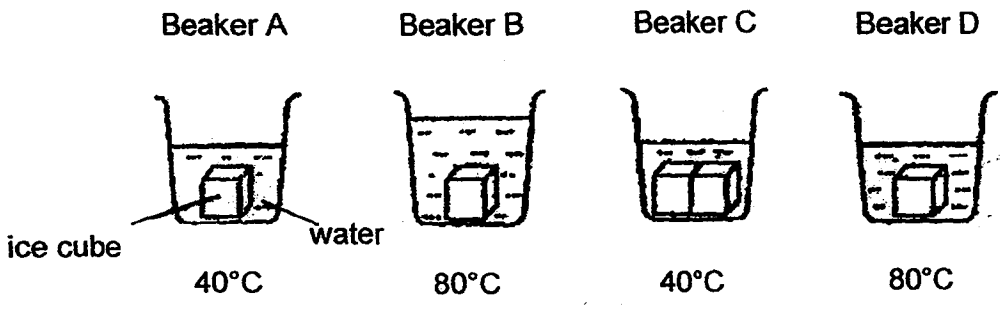
The diagram below shows the location of plants X, Y and Z that bear these three fruits.



Which of the following shows the correct match between fruits P, Q and R and plants X, Y and Z?

	Plant X	Plant Y	Plant Z
(1)	P	Q	R
(2)	Q	P	R
(3)	R	Q	P
(4)	Q	R	P

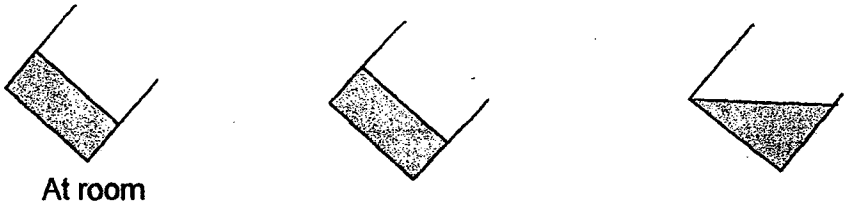
18. Mrs Raj wanted to conduct an experiment to show her class how the temperature of water affects the melting rate of an ice cube.



Which two beakers should Mrs Raj use for the experiment to ensure a fair test?

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

19. The diagrams below show substance X in a beaker when it is at different temperatures.

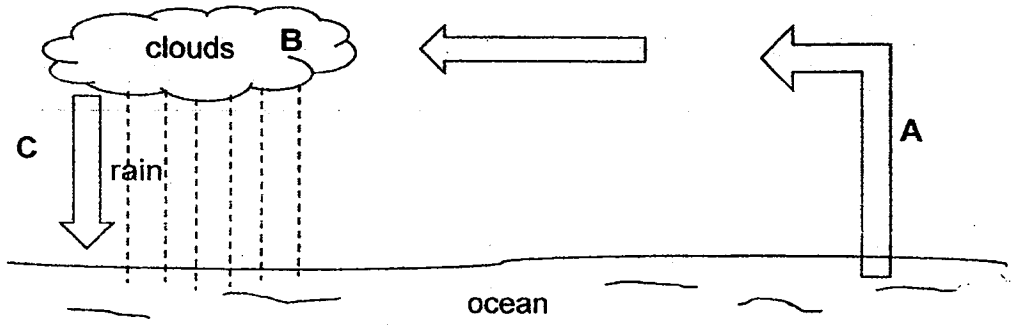


Based on the diagrams, which of the following statements about Substance X are definitely correct?

A It is a solid at room temperature.
B It has a definite volume at 10°C.
C It has a definite shape at 80°C.
D It has a melting point of 80°C.

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

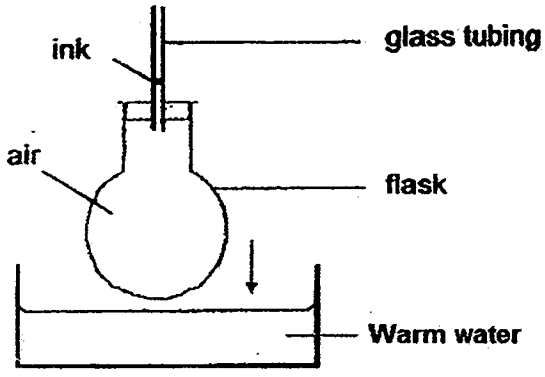
20. A, B and C are processes in the water cycle.



Which of the following shows the correct change in states of water at Processes A, B and C?

	A	B	C
(1)	Liquid to gas	Gas to solid	Solid to Liquid
(2)	Solid to liquid	Liquid to gas	Gas to Solid
(3)	Liquid to gas	Gas to liquid	No change
(4)	Gas to liquid	Liquid to gas	No change

21. The diagram below shows an empty flask being lowered into a basin of warm water.



Why did the ink rise in the glass tubing when the flask is placed into the warm water?

(1) The flask loses heat to the warm water and contracts.
(2) The flask gains heat from the warm water and expands.
(3) The air in the flask gains heat from the warm water and expands.
(4) The air in the flask loses coldness to the warm water and expands.

22. Four rods A, B, C and D, made of different metals were placed near each other. The table below shows the observations.

Rods that were brought close together	Observation
A and B	Nothing happened
B and C	Rod B attracted Rod C
B and D	Rod B repelled Rod D

Which of the following correctly identifies the metals used to make Rods A, B and C only?

	Rod A	Rod B	Rod C
(1)	Magnet	Copper	Steel
(2)	Steel	Magnet	Copper
(3)	Copper	Steel	Magnet
(4)	Copper	Magnet	Steel

23. Diagram 1 shows magnet A at rest above magnet B. The distance between magnet A and magnet B is d cm. James removed magnet A and heated it above a flame as shown in diagram 2.

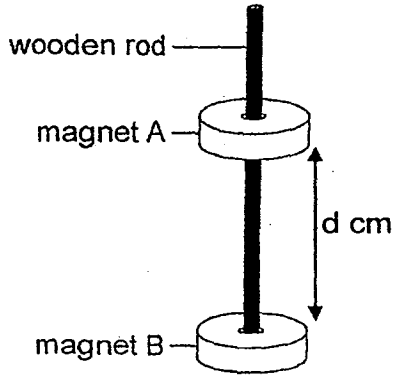


Diagram 1

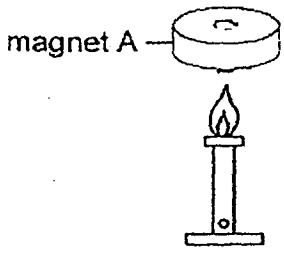
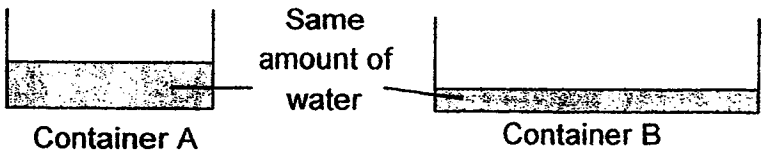


Diagram 2

Which of the following would happen to distance d, if James placed magnet A back on the wooden rod in the same way as in Diagram 1 after he had heated magnet A?

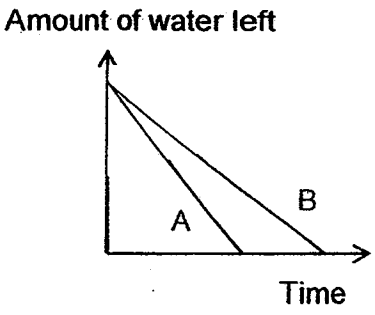
	distance d	Reason
(1)	decreases	Heating causes Magnet A to be heavier.
(2)	decreases	Heating causes Magnet A to lose some magnetism.
(3)	increases	Heating causes Magnet A to be lighter.
(4)	no change	Heating does not affect Magnet A.

24. Meri pours the same amount of tap water into two containers, A and B, as shown in the pictures below.

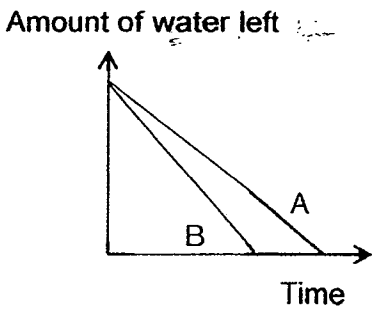


She then measured the amount of water left in each container over time. Which of the following shows the correct graph?

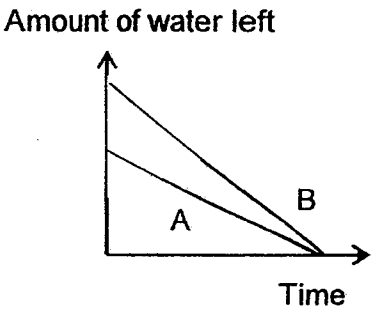
(1)



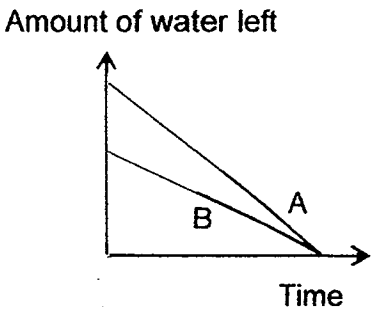
(2)



(3)



(4)



25. The table below shows the properties of 4 objects, K, L, M and N.

	K	L	M	N
Has a definite shape	√	X	X	X
Has a definite volume	√	X	√	X
Can be seen	√	√	√	X
Has mass	√	X	√	√

Which of the following classification tables is correct?

(1)

Can be compressed	Cannot be compressed
K	L
M	N

(2)

Solid	Not a Solid
K	L
M	N

(3)

Has definite volume	Has no definite volume
K	L
M	N

(4)

Matter	Non-matter
K	L
M	N

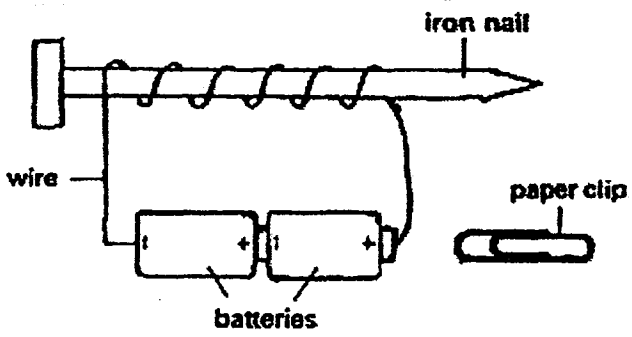
26. The following table shows the melting points and boiling points of four substances.

Substance	Melting Point (°C)	Boiling Point (°C)
A	33	125
B	0	100
C	110	250
D	-39	80

Which of the following correctly shows the state of substances A, B, C and D, at the following temperatures?

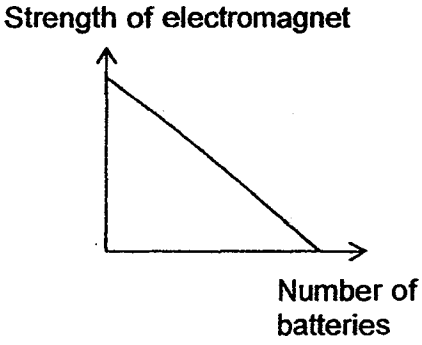
	Liquid at 0 °C	Solid at 50°C	Gas at 110 °C
(1)	A	B	C
(2)	B	D	D
(3)	C	A	A
(4)	D	C	B

27. William carried out a few experiments with an electromagnet shown in the diagram below and plotted a few graphs based on his results.

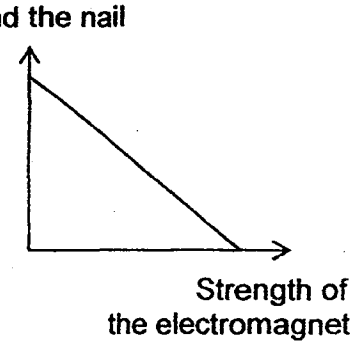


Which of the following graphs are correct?

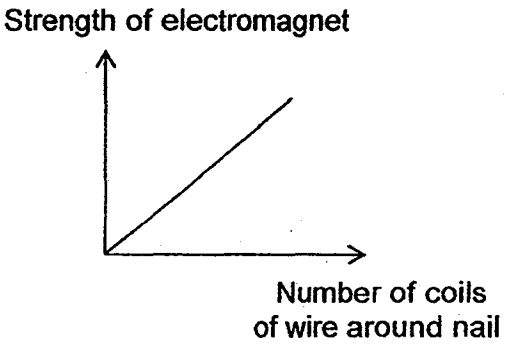
(1)



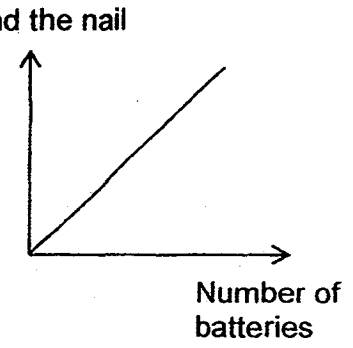
(2)



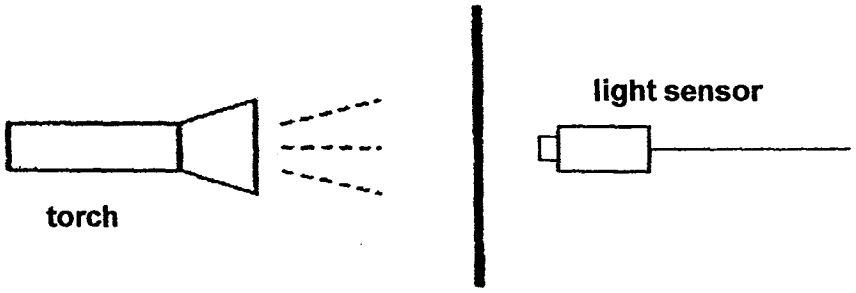
(3)



(4)



28. Samuel conducted an experiment using four different materials, A, B, C and D, in a darkened room. He placed material A in front of the torch and recorded the readings on the light sensor.



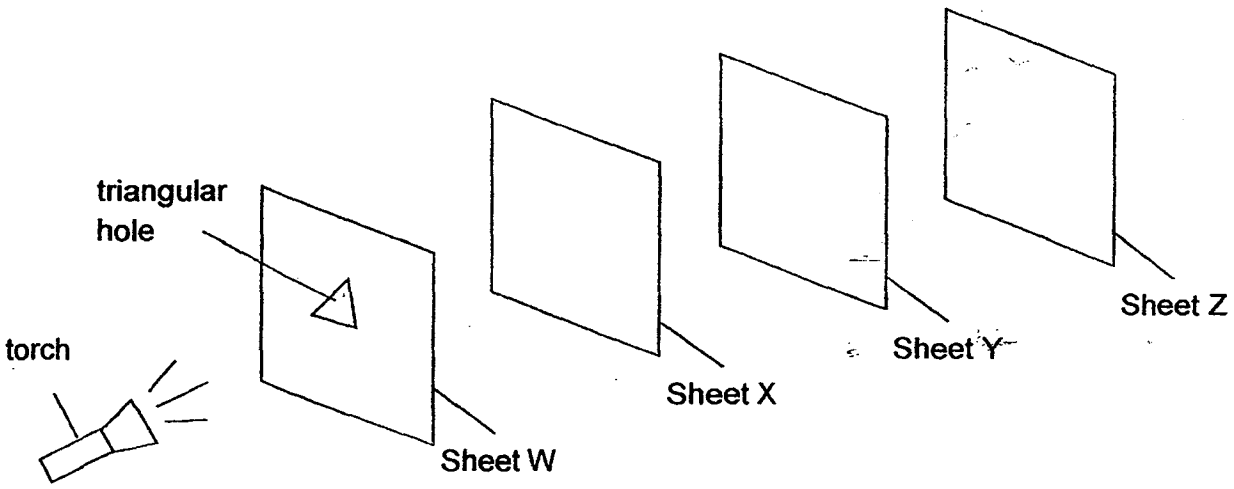
He repeated the experiment with materials B, C and D. The table below shows the amount of light recorded on the light sensor for each material.

Material	Amount of light recorded (units)
A	1000
B	0
C	200
D	1500

Which of the following gives the correct arrangement of the materials according to their degree of transparency to light?

	Degree of transparency to light			
	Allows the most light to pass through →			Allows the least light to pass through
(1)	A	B	C	D
(2)	B	C	A	D
(3)	D	A	C	B
(4)	D	C	B	A

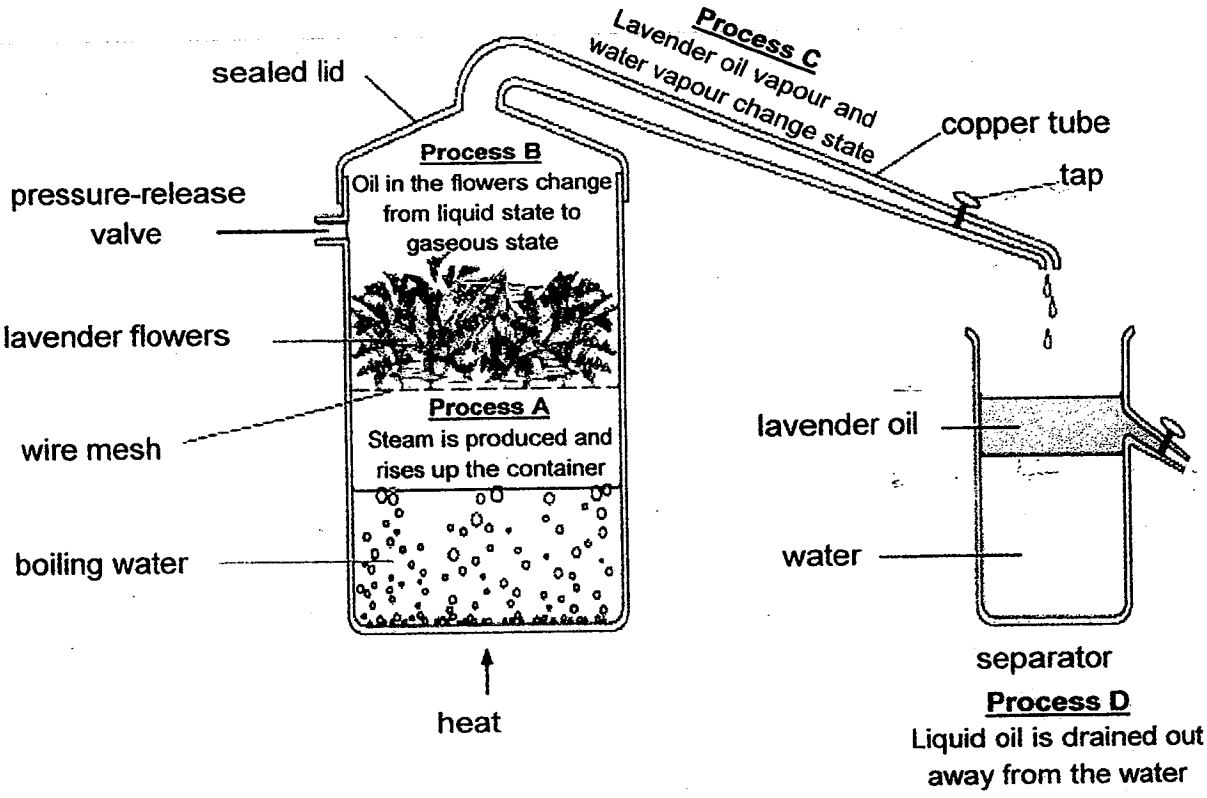
29. Timothy carried out an experiment in a dark room with the set-up as shown in the diagram below. He arranged four sheets W, X, Y and Z, in a straight line. When the torch was switched on, Timothy observed that a bright triangular patch of light was seen on Sheet Y only.



Which of the following about sheets W, X, Y and Z is correct?

	Allows light to pass through	Does not allow light to pass through	Not possible to tell
(1)	W	X	Y, Z
(2)	X	W, Y	Z
(3)	X	Y, Z	W
(4)	Y, Z	W	X

30. Lavender oil is a perfume obtained from lavender flowers.
Steam at 100°C is passed through the flowers in the apparatus below.



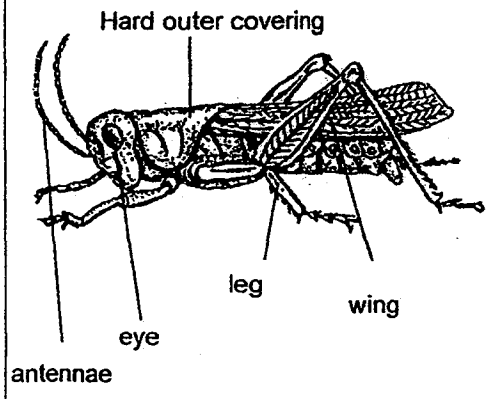
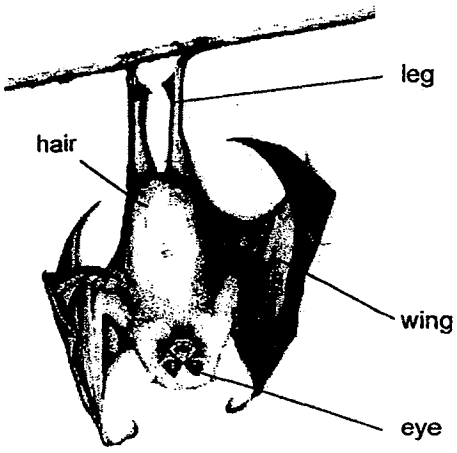
Which of the following about water during each process in the above setup is **incorrect**?

	Process	Statement
(1)	A	Water in its liquid state gained heat and turned to gaseous state.
(2)	B	Water in its gaseous state lost heat to the flowers.
(3)	C	Water in its gaseous state lost heat to the copper tube and turned to liquid state.
(4)	D	Water in its liquid state gained heat and turned to gaseous state.

Name: _____ ( )
Class P5

Section B: 40 marks
Read the questions carefully and write down your answers in the spaces provided.

31. The following table shows information about organisms X and Y.

Information	Organism X	Organism Y
Physical description		
What the young eat	Leaves	Milk produced by the mother
What the adults eat	Leaves	Nectar and fruits
Reproduction method	By laying eggs	By giving birth to young alive

(a) Based on the physical characteristics given above, compare organisms X and Y and write down two differences. [2]

Difference 1:

_____

_____

Difference 2:

_____

_____

Continued next page

2

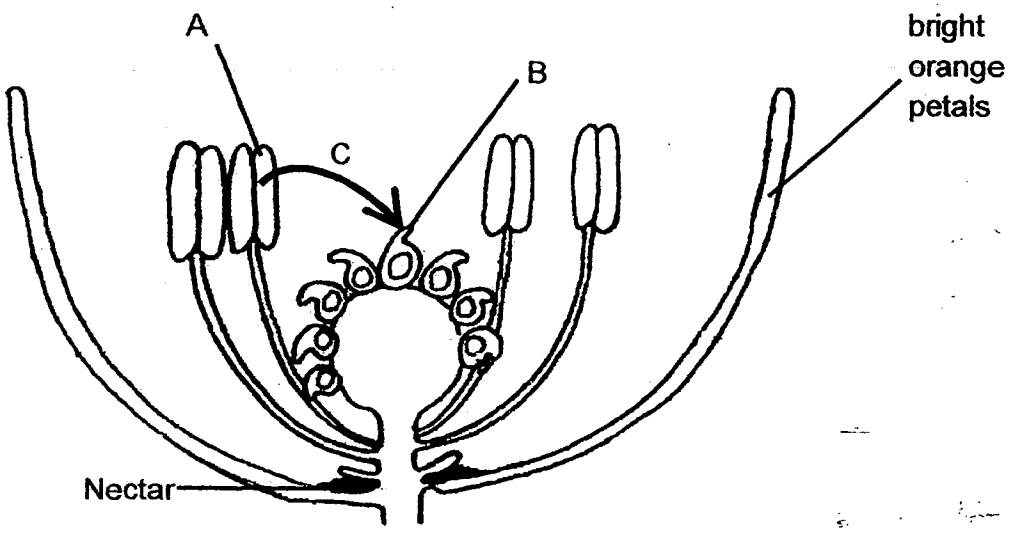
(b) Based on the information given, which organism, X or Y, is a mammal? Give 2 reasons for your answer. [1]

Based on the information given, both the young and adult of X feed on leaves.

(c) Explain why feeding on the same type of food is a disadvantage to the young of Organism X's survival. [1]

2

32. The diagram below shows the cross-section of a flower.



A and B are parts of the flower and C shows a process taking place.

(a) What are B and C? [1]

Part B: _____

Process C: _____

(b) Based on the diagram above, is the flower most likely insect or wind pollinated? Give 2 reasons for your answer. [2]

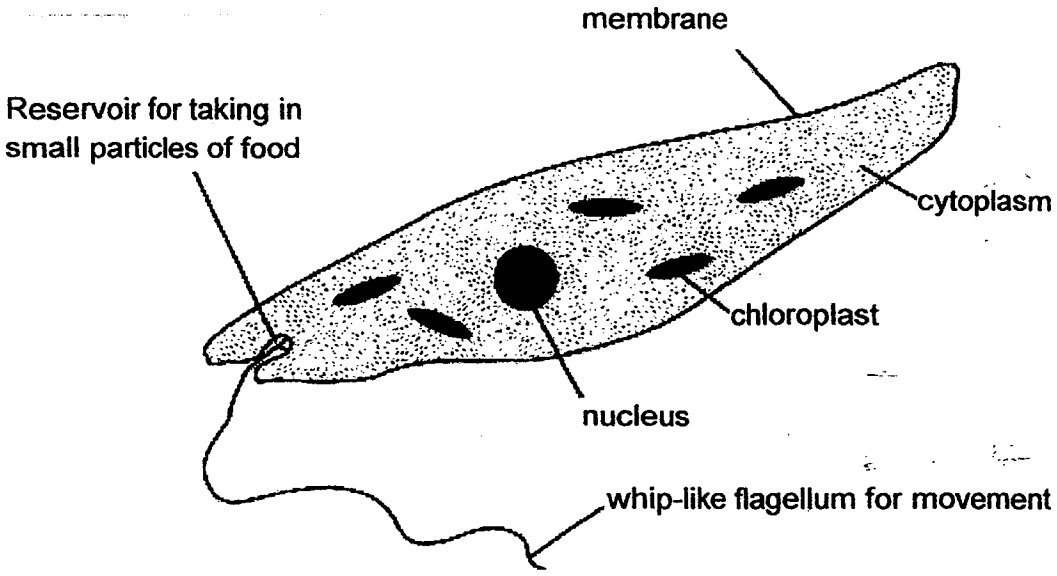
_____

_____

_____

3

33. Ali viewed Organism E, a single-celled organism, under a microscope.



Organism E

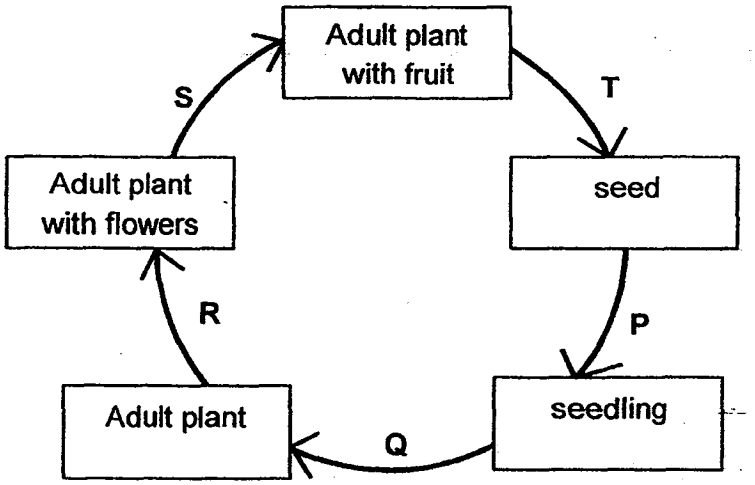
Ali was not sure whether Organism E was a plant or an animal cell.

Complete the table below by giving 1 reason each why Organism E could be a plant or an animal cell. [2]

	Why Organism E could be a plant or animal cell	
	Plant cell	**Animal cell**
Give 1 reason	_____	_____
	_____	_____
	_____	_____
	_____	_____

2

34. The diagram below shows the stages in the life cycle of a plant.



(a) In the table below, write down letters, P, Q, R, S or T, to indicate when germination and fertilisation occur in the life cycle of the plant. [1]

Process	When it occurs
Germination	
Fertilisation	

(b) Karen looked at the life cycle above and made the following statement.

All plants have the same stages in their life cycle.

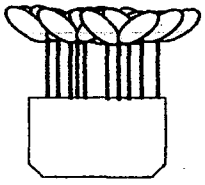
Do you agree with her statement? Explain your answer. [1]

_____

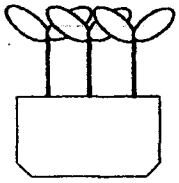
_____

2

35. Muthu obtained two similar pots of soil. He planted ten seeds in Pot A and 3 seeds in Pot B. He watered each pot with the same amount of water.



Pot A



Pot B

Muthu noted that the seedlings in Pot A grew unhealthily as they were longer and thinner than those in Pot B.

(a) What was the aim of Muthu's experiment? [1]

_____

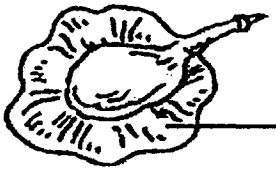
_____

(b) Explain why the seedlings in Pot A were longer and thinner. [1]

_____

_____

(c) The angsana fruit shown in the diagram below has a wing-like structure.



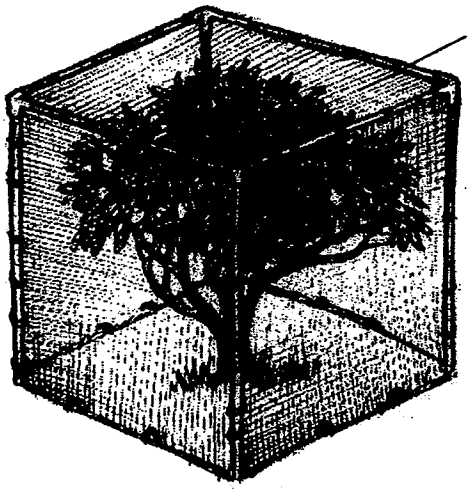
Explain how the wing-like structure help prevent the new young angsana plants from growing unhealthily like the plants in Pot A. [1]

_____

_____

3

36. Farmer Tim picked two similar fruit trees, A and B, growing next to each other. Tree A had a net placed over it. Both trees produced about the same number of flowers per month. He then counted the average number of fruits each tree produced per month.



Tree A

Tree B

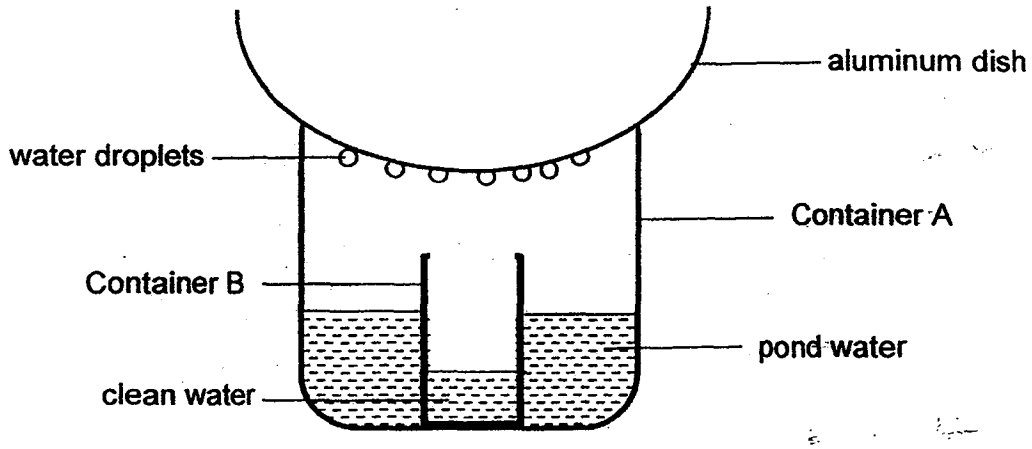
	Tree A	Tree B
Average number of fruits produced per month	20	66

(a) Give a reason why the average number of fruits produced by Tree A is less than Tree B. [2]

(b) Even though Tree A produced less fruits, some farmers still choose to net their trees. Suggest a reason why. [1]

3

37. The diagram shows a set-up for obtaining clean water from some pond water.

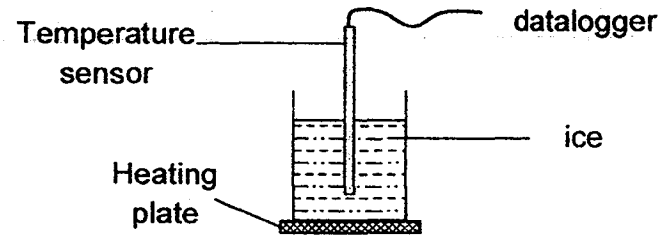


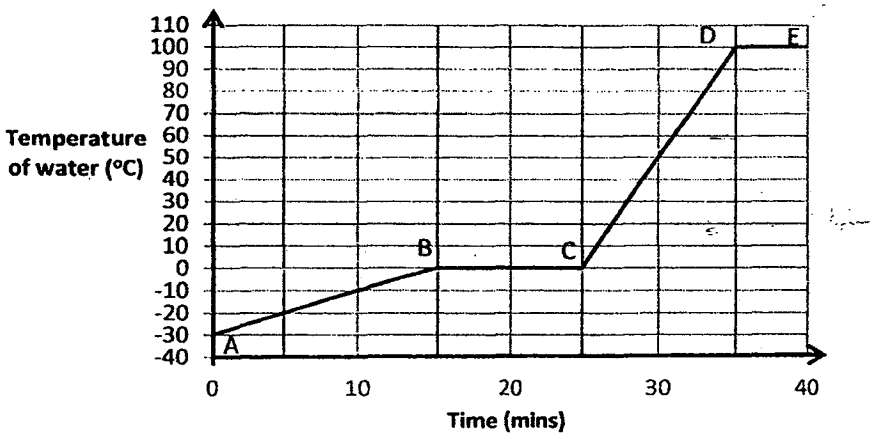
(a) Explain how the water droplets on the underside of the aluminium dish were produced. [2]

(b) Without changing the set-up, state what can be done to increase the rate at which the amount of clean water was formed? [1]

3

38. Eric heated a beaker of ice. He used a temperature sensor to record the temperature changes of the water over 40 minutes.





(a) Name the processes taking place during the following period: [1]

BC: _____

DE: _____

(b) Why is it better to use a temperature sensor instead of a thermometer for the experiment? [1]

_____

(c) During which period, AB or CD, did the water gain more heat? Explain your answer. [1]

_____

_____

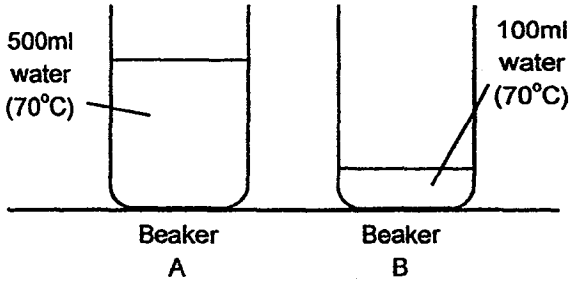
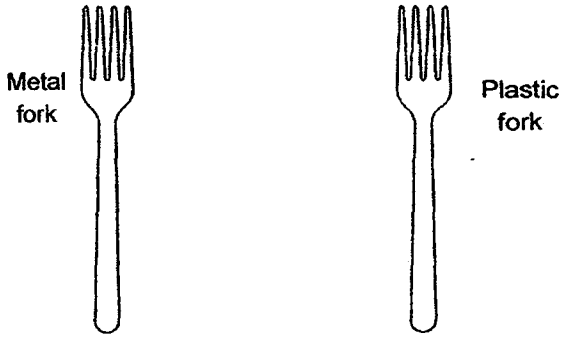
(d) Explain why the temperature of water remains constant at DE even though it was still gaining heat. [1]

_____

_____

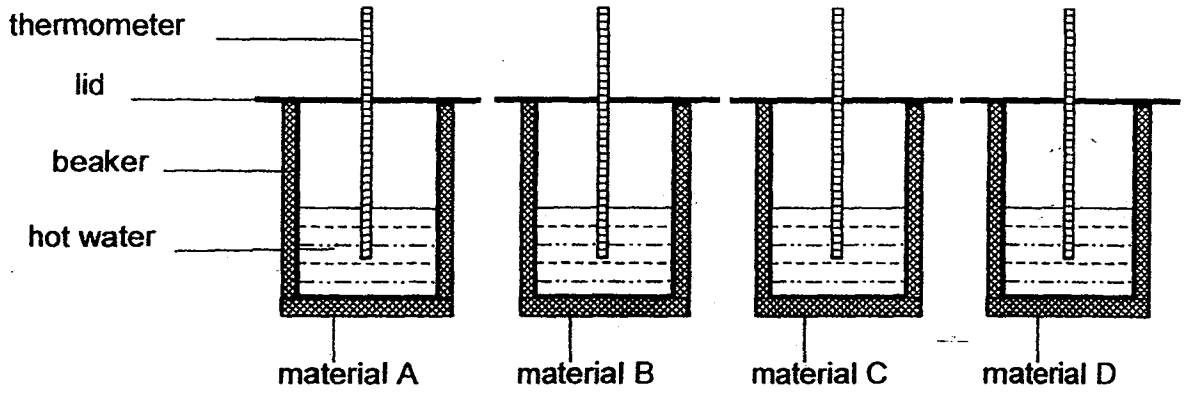
4

39. For each of the following, explain the observations. [4]

	Observations	Explanation
(a)	 Water in Beaker B cooled down faster than water in Beaker A.	
(b)	 The metal fork felt colder than the plastic fork when touched.	

4

40. A scientist wrapped 4 types of material, A, B, C and D around similar beakers of hot water. She recorded the temperature of the water at the start and 20 minutes later.



The results are shown below.

Time (minutes)	Temperature of water in beaker /°C			
	Material A	Material B	Material C	Material D
0	60	60	60	60
20	30	50	35	42

(a) Identify the following variables in the investigation: [1]

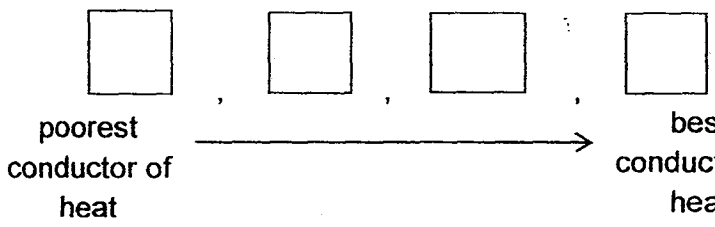
(i) Measured variable

_____

(ii) Changed variable

_____

(b) Arrange the materials A, B, C and D according to their rate of heat conductivity from the poorest conductor to the best conductor of heat. [1]



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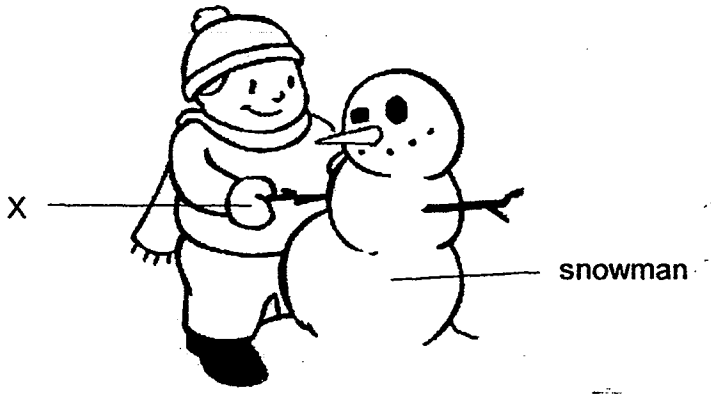
2

(c) The diagram below shows a child playing in the snow.



Which material, A, B, C or D would be most suitable to be made into the part labelled X? Explain your answer. [2]

_____

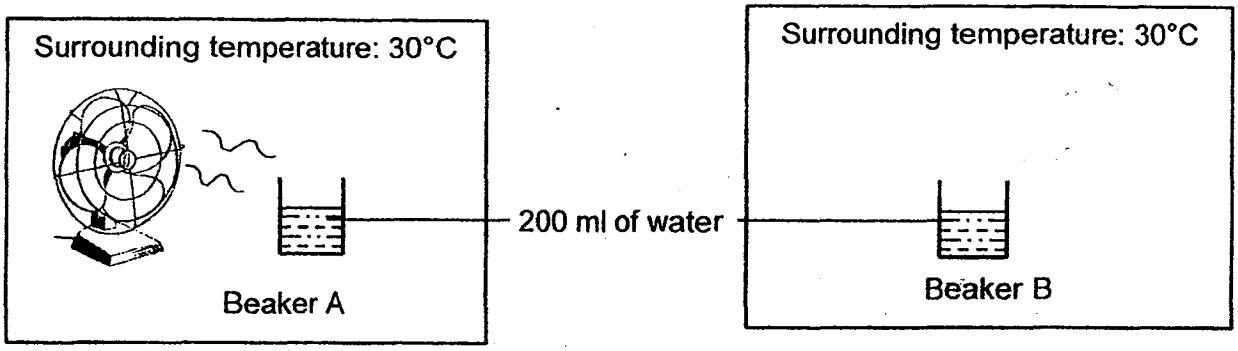
_____

_____

2

41. The set-ups below show two similar beakers A and B containing equal amounts of water placed in rooms of similar surrounding temperatures.

Beaker A has a fan constantly blowing across the beaker.



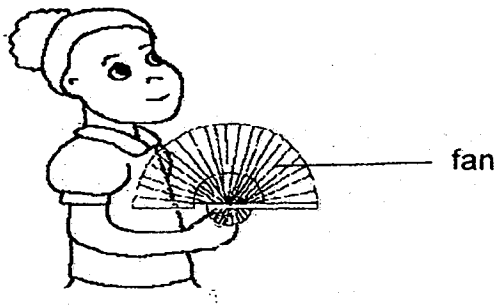
The table below shows the amount of water left in beakers A and B after 2 hours.

	Beaker A	**Beaker B**
Amount of water left (ml)	50	120

(a) Using the information given, which beaker, A or B, has a higher rate of evaporation? Explain your answer. [1]

_____

_____



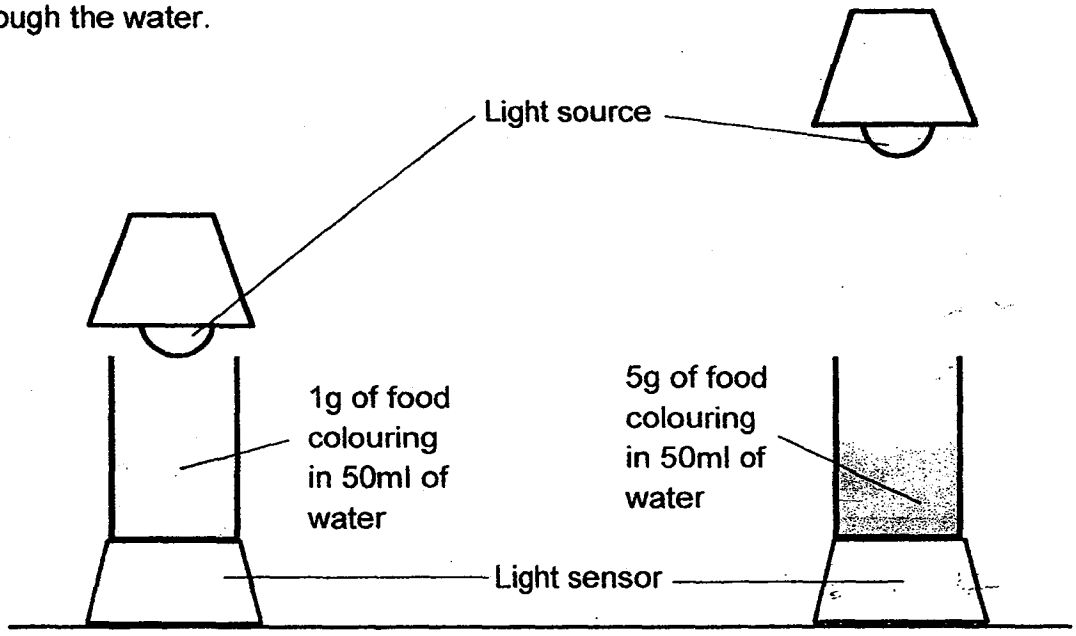
(b) On a hot day, children like to fan themselves to keep cool. Explain how this action keeps them cool. [2]

_____

_____

3

42. Farah carried out an investigation using the set-up below. She wanted to find out if the amount of food colouring added to water affects the amount of light passing through the water.



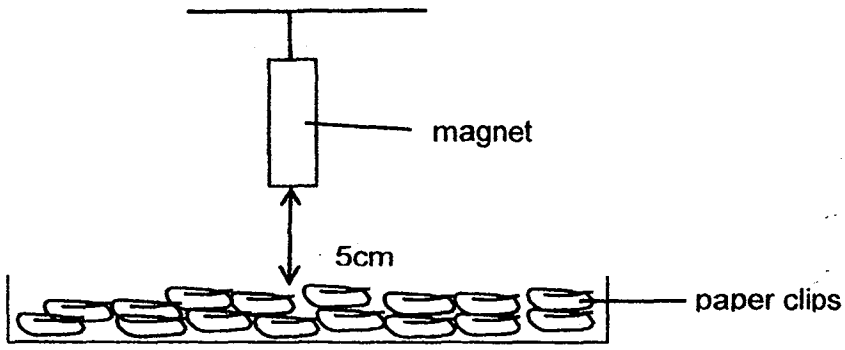
Farah did not carry out a fair test in her investigation.

(a) Explain why her experiment was not a fair one. [2]

(b) What should Farah do to make the investigation a fair one? [1]

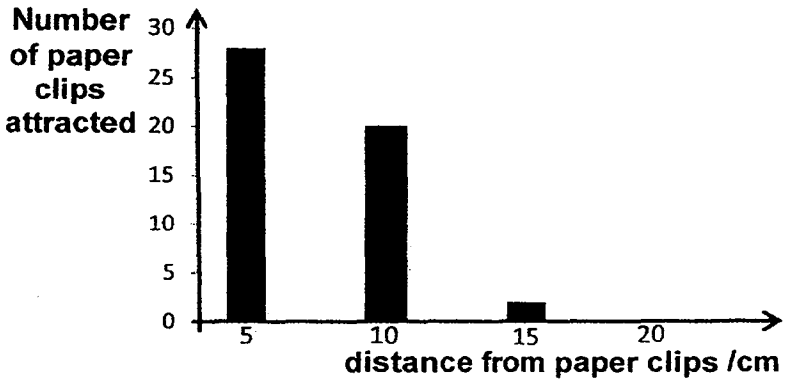
3

43. Daniel carried out an experiment using a magnet and some paper clips.



He hung the magnet 5 cm above the paper clips and counted the number of paper clips attracted to it.

He repeated the experiment with different distances of magnet hung above the paper clips. The results of his experiment are shown in the graph below.



(a) What is the relationship between the distance of magnet from the paper clips and the number of paper clips attracted? [1]

_____

_____

(b) What does the experiment show about the strength of a magnet? [1]

_____

_____

End of Paper

2

Ai Tong School P5 Mid Year Examination Science 2014

Booklet A

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

Booklet B

31 a Difference 1: Organism X has a pair of antennae but organism Y does not.
Difference 2: Organism X has six legs but Organism Y has two legs.

b Y is a mammal. Like all mammals, Y has an outer covering of hair and its young feed on its mother's milk, hence Y is a mammal.

c This is a disadvantage as the young would often have to compete with the adults for food and thus there would not be enough food for the young to eat if the adult eats all the food.

32 a Part B: stigma
Process C: pollination

b Insect pollinated. The petals of the flower are brightly coloured orange to attract insects and there is also nectar to attract insects to feed on the nectar, hence in the process helping to pollinate the flower.

33

Plant Cell	Animal Cell
Like most plant cells (i.e. all leaf cells), the organism contained chloroplasts to make food on its own.	Like all animal cells, the organism has a cell membrane and no cell wall.

34 a

Germination	P
Fertilisation	S

b No. The life cycle above represents that of flowering plants. Non-flowering plants do not bear flowers and hence not all plants will have the same life cycle as above.

35 a To find out how the number of seeds growing in each of the similar pots of soil (A and B) would affect the growth of the plants.

b They had to compete against each other for resources like light, water, carbon dioxide and space for growth, hence overcrowding can occur, forcing the seedlings in A to grow taller to reach more sunlight for instance.

c The wing-like structure will aid in the angsana fruit to stay air borne for longer periods of time and be dispersed to a distance further away from the parent plants, hence reducing the competition for resources for healthy growth as compared to the plants in Pot A that are experiencing competition for resources due to overcrowding.

36 a The netting in A prevents most insect (animal) pollinators from dispersing pollen grains by reaching the flowers on the trees compared to B. In A, likely, only insects that are small enough can pass through the netting to pollinate the flowers / the flowers undergo self-pollination, thus the average number of fruits produced per month is lesser than B.

b By netting their trees, pests that eat the fruits on tree A will not be able to reach the tree, so there would be lesser damaged or eaten fruits that the farmers cannot sell.

37 a When the pond water gained heat from the surroundings and evaporated from Container A, the water vapour lost heat to and condensed on the cooler aluminium dish forming the water droplets, which then dripped into container B to form clean water.

b Place some ice cubes into the aluminium dish to increase the temperature difference between the aluminium dish and the water vapour.

38	a	BC: melting DE: boiling
	b	The temperature sensor eliminates parallax error in reading the thermometer wrongly due to incorrect positioning of the eye and is able to record the continuous temperature change across the duration of the experiment.
	c	CD. There was a larger increase in temperature for CD than AB, showing that it gained more heat.
	d	The water is undergoing boiling, hence temperature remains constant at its boiling point.
39	a	As beaker B has a smaller volume of water, there was a smaller amount of heat to be lost in beaker B than in beaker A to be cooled, hence water in beaker B lost heat to the surroundings faster than water in beaker A.
	b	The metal fork is a better heat conductor than the plastic fork, hence the metal fork was able to conduct heat away from the hand faster than the plastic fork causing the hand to feel cooler.
40	a	(i) Temperature of water in beaker (ii) The type of material
	b	B → D → C → A
	c	Material B. Material B is the poorest conductor of heat and thus would conduct heat away from the hand to the cooler surrounding the slowest and hence be able to keep the child's hands warmer for the longest period of time.
41	a	Beaker A. There was a lesser amount of water left in the beaker due to the fan blowing across the beaker, resulting in a higher rate of evaporation.
	b	When the children fan themselves, the higher rate of evaporation of the perspiration from the skin would allow more heat to the lost from the children to the surroundings, keeping the children cool.
42	a	There were more than one changed variable, including the distance between the light source and the water, instead of having just one changed variable which is the amount of food colouring added. Hence she could not ensure that the difference in the amount of light passing measured during the experiment is due to the amount of food colouring added to the water and not the distance between the light source and the water.
	b	She should place both light sources at an equal distance, for instance, 10 cm from the water to ensure a fair test.
43	a	As the distance of magnet from the paper clips increases, the number of paper clips attracted decreases.
	b	The strength of the magnet decreases as the distance between the magnet and the magnetic material decreases.