

TAO NAN SCHOOL

PRIMARY SIX SCIENCE MID-YEAR EXAMINATION 2011

Booklet A

NAME : _____ ()

CLASS : Primary 6 ()

DATE : 12 May 2011

TOTAL TIME FOR BOOKLETS A & B: 1h 45min

BOOKLET A	/60
BOOKLET B	/40
TOTAL	/100

Parent's signature: _____

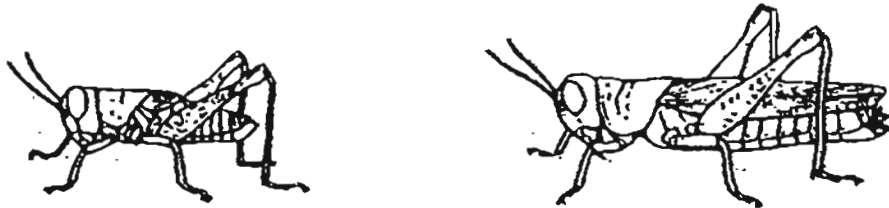
INSTRUCTIONS TO PUPILS

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Section A (30 x 2 marks)

For each question, 1 to 30, four options are given. One of the four options is the correct answer. Select the correct answer and shade its corresponding oval (1, 2, 3 or 4) on the Optical Answer Sheet.

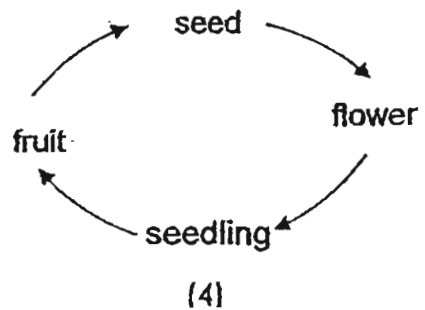
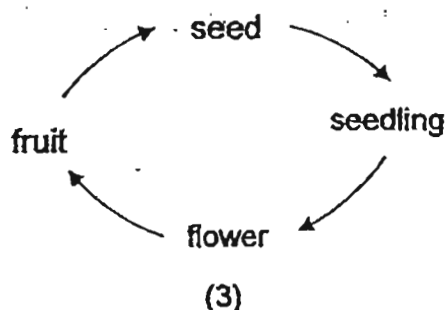
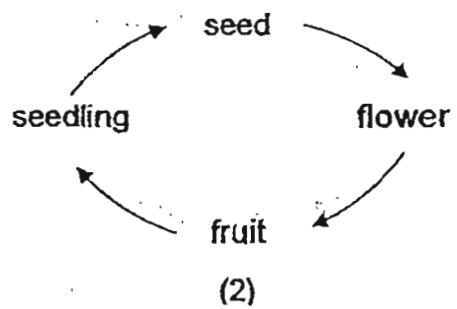
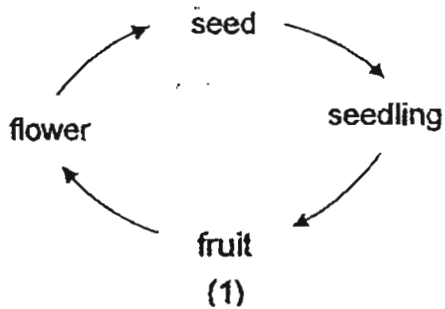
1. The diagrams below shows a grasshopper and its young.



Based on your observations, which of the following is true?

- (1) The young moults to grow bigger.
- (2) The young cannot fly but the adult can.
- (3) The young and the adult both have six legs.
- (4) The young has smaller wings than the adult.

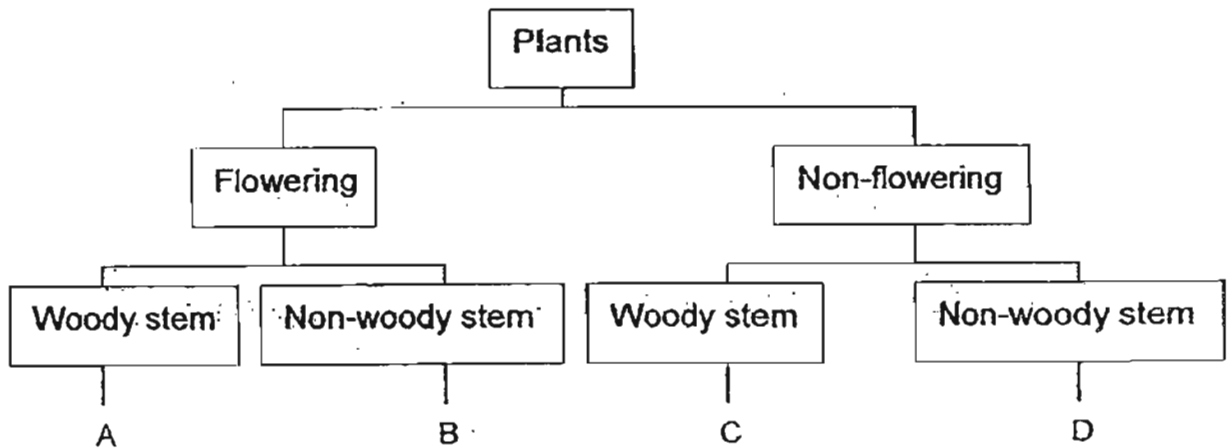
2. Which of the following below shows the life cycle of a papaya plant?



3. The table below presents the characteristics of two plants, Pyke and Rine.

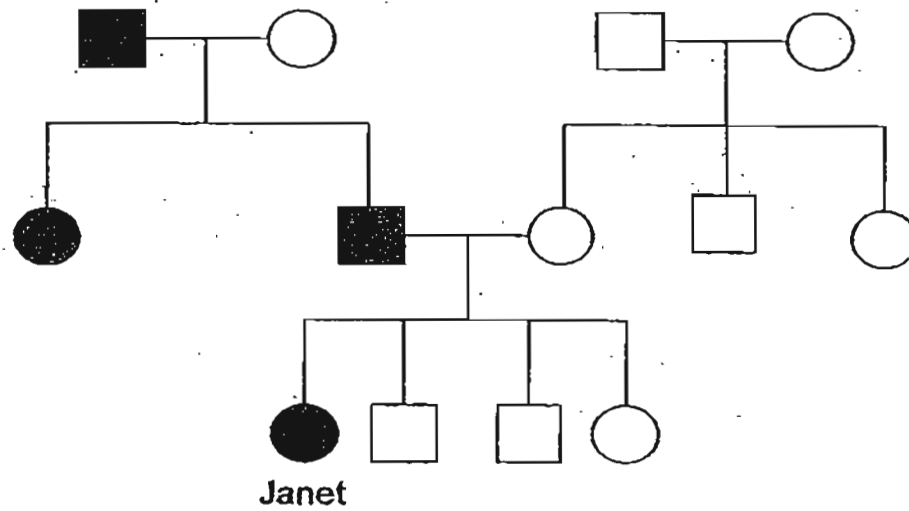
Plants	Pyke	Rine
Characteristics		
Do they bear fruits?	No	Yes
Do they have strong stem?	Yes	No

From the table above, where do Pyke and Rine belong in the classification table below?



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

4. The diagram below shows Janet's family tree.



Key



Male



Female



Male with freckles

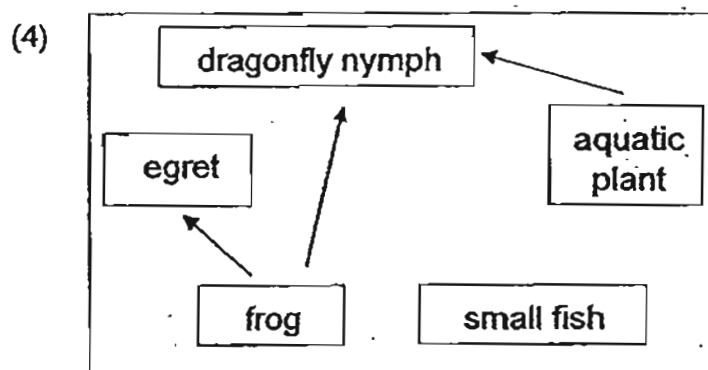
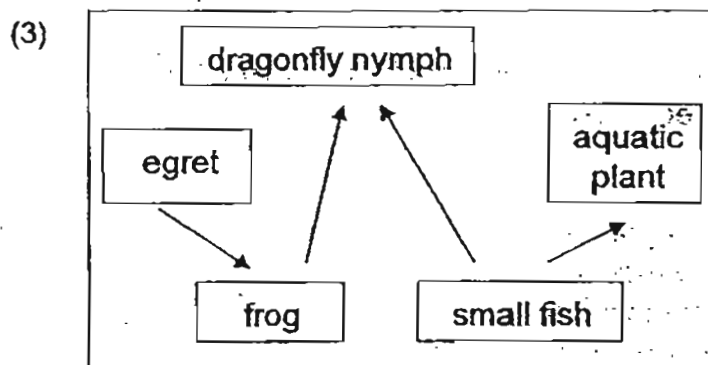
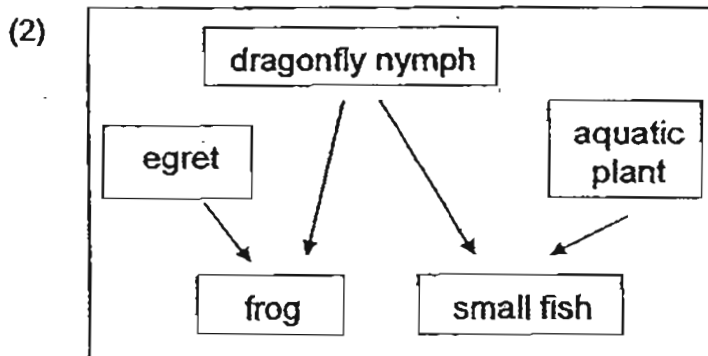
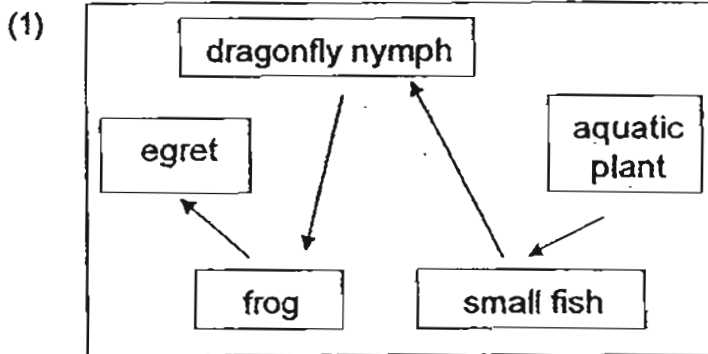


Female with freckles

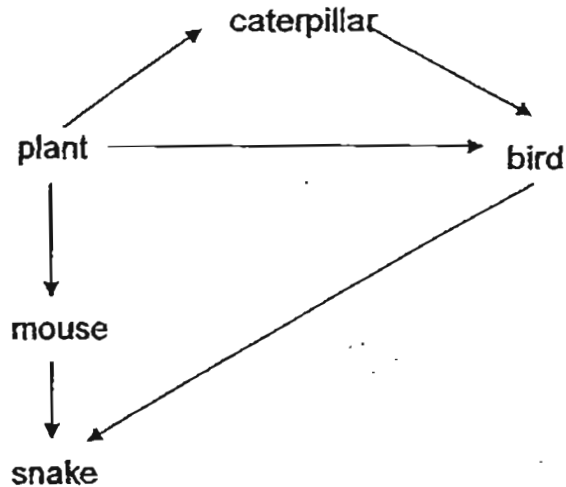
Which of the following about Janet's family is true?

- (1) Janet has two uncles altogether.
- (2) Janet's freckles trait came from her father.
- (3) Janet's maternal grandmother has freckles.
- (4) Janet is the only one in her family with freckles.

5. Egrets are birds found in shady areas of ponds. They feed on frogs. Which of the following shows the most likely food relationships in the ponds?



6. In the food web below, which population will **first** increase in number if there is an increase in the bird population?



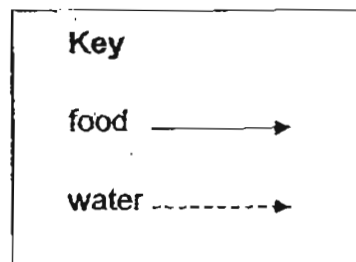
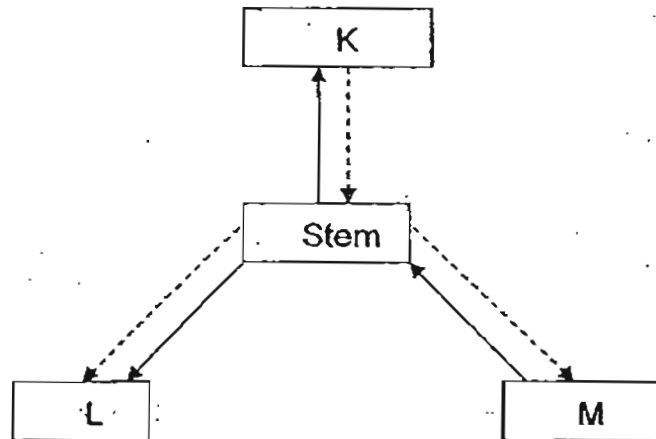
- (1) plant
- (2) snake
- (3) mouse
- (4) caterpillar

7. The following describe how sexual reproduction in plants takes place. Arrange them in the correct order.

- A Seed develops
- B Anther releases pollen grains
- C Pollen tube grows towards ovule
- D Male cell fuses with female cell
- E Pollen grains are transferred to stigma

- (1) B → E → D → C → A
- (2) B → E → C → D → A
- (3) E → B → D → C → A
- (4) E → B → C → A → D

8. The diagram below shows the direction of movement of water and food in a plant. The different plant parts are represented by K, L and M.



What are K, L and M?

	K	L	M
(1)	fruit	root	leaves
(2)	root	leaves	fruit
(3)	leaves	fruit	root
(4)	root	fruit	leaves

9. Jiaqing conducted an experiment to find out how overcrowding affects the growth of plants. Four pots of plants were placed at the same part of the garden. The pots and plants were of the same type.

Variables	Pot A	Pot B	Pot C	Pot D
Amount of soil (g)	500	500	750	500
Amount of water (ml)	500	250	250	250
Size of pot (cm ³)	1500	1000	1000	1000
Number of plants	4	12	12	4

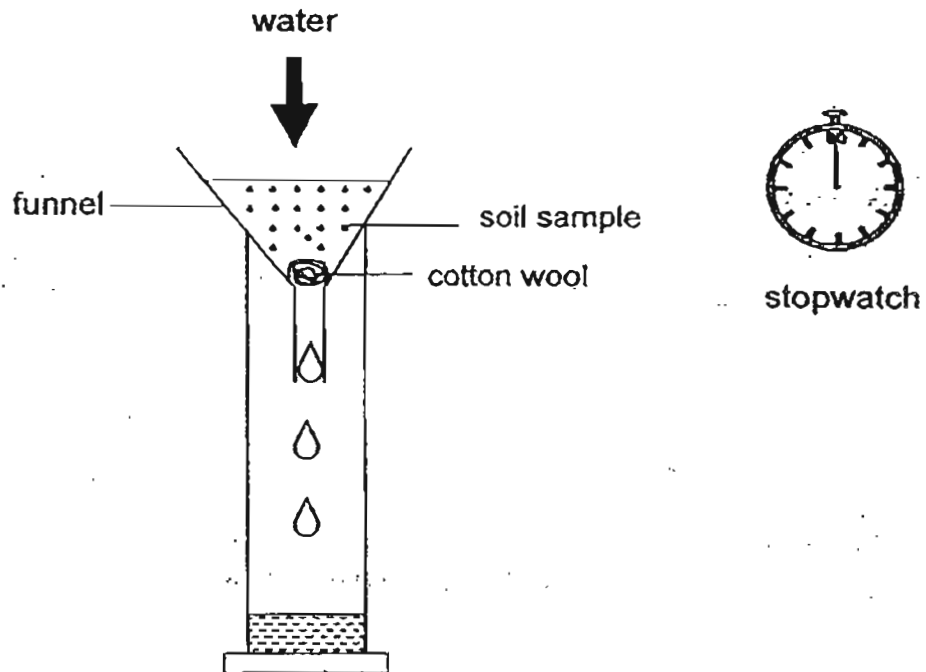
Which two pots must she use for the experiment to be a fair one?

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

10. Pauline is given three dishes of white substances, A, B and C. These substances are rice flour, salt and dry ice. Which of the following can she use to identify the rice flour?

- (1) Add a few drops of water to each of the dishes.
- (2) Add a few drops of iodine to each of the dishes.
- (3) Add a few drops of alcohol to each of the dishes.
- (4) Add a few drops of limewater to each of the dishes.

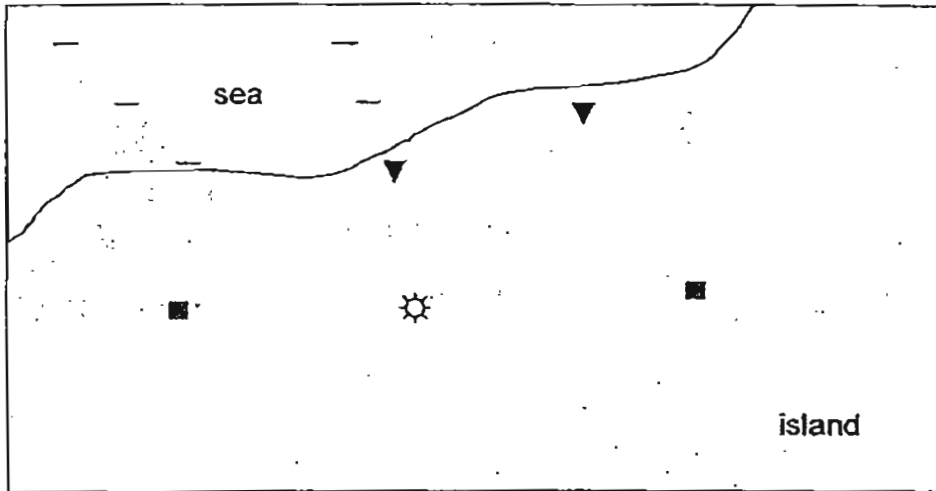
11. Jing Yang wants to find out how fast water can pass through four different types of soil. He sets up the experiment as shown in the diagram below. He measures the time taken for 100cm³ of the water to pass through each type of soil.



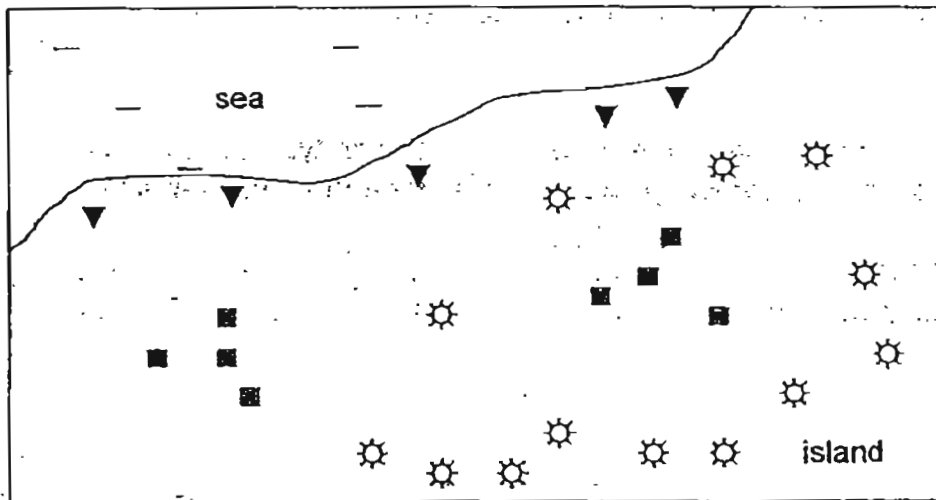
He records the results in the table below. Which type of soil is most suitable for a plant which grows well in a dry and sandy habitat?

Type of soil	(1)	(2)	(3)	(4)
Time taken (seconds)	62	43	55	26

12. The diagram shows part of an island where three types of plants (▼, ■, ☼) are growing.



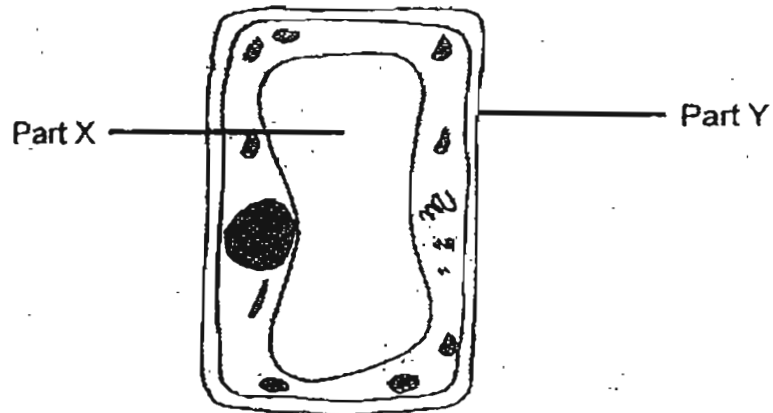
The wind direction was southwards. After 3 years, the number of each type of plant has increased, as shown below.



How are the fruits or seeds of each type of plant dispersed?

	▼	■	☼
(1)	splitting action	wind	animals
(2)	animals	wind	water
(3)	water	splitting action	wind
(4)	water	splitting action	animals

13. Study the diagram of a plant cell shown below.



Which of the following about the functions of Part X and Part Y is true?

	Part X	Part Y
(1)	Most of the cellular activities take place here.	Supports and gives the cell its shape
(2)	Stores nutrients and waste products	Supports and gives the cell its shape
(3)	Most of the cellular activities take place here.	Controls the movement of substances entering or leaving the cell
(4)	Stores nutrients and waste products	Controls the movement of substances entering or leaving the cell

14. The table below shows the number of organisms in a habitat.

Organism	Number of organisms
Lotus	5
Tadpole of a toad	13
Pondskater	8
Toad	4
Water hyacinth	7
Guppy	10

How many populations of organisms are there in this habitat?

- (1) 5
- (2) 6
- (3) 17
- (4) 47

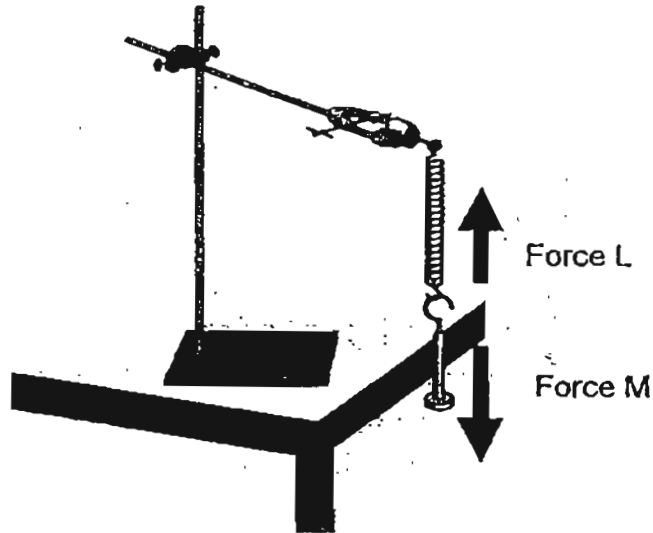
15. The table below shows how organisms are classified according to different communities.

Community X	Community Y	Community Z
Horseshoe crab	Aphid	Wood louse
Mudskipper	Butterfly	Centipede
Mangrove plant	Balsam plant	Mushroom

Which of the following are correctly classified?

	Community X	Community Y	Community Z
(1)	Heron	Bee	Slug
(2)	Guppy	Ant	Snail
(3)	Seahorse	Frog	Dragonfly
(4)	Tree crab	Tadpole	Millipede

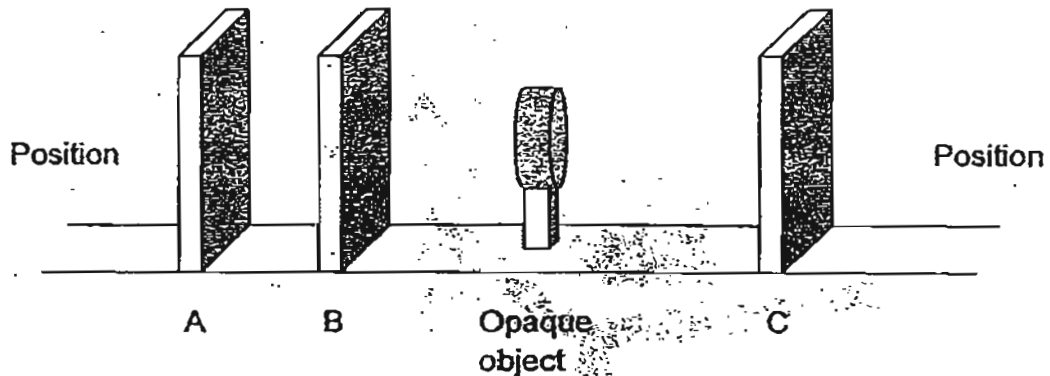
16. Study the set-up below.



The load hanger is hung from a spring on a retort stand. Identify the two forces, L and M, acting on the load hanger.

	Force L	Force M
(1)	Elastic spring force	Weight
(2)	Weight	Elastic spring force
(3)	Friction	Gravity
(4)	Weight	Friction

17. Siow Ming carried out an investigation. He placed 3 similar screens of different materials, A, B and C, and an opaque object on a table as shown in the diagram below.

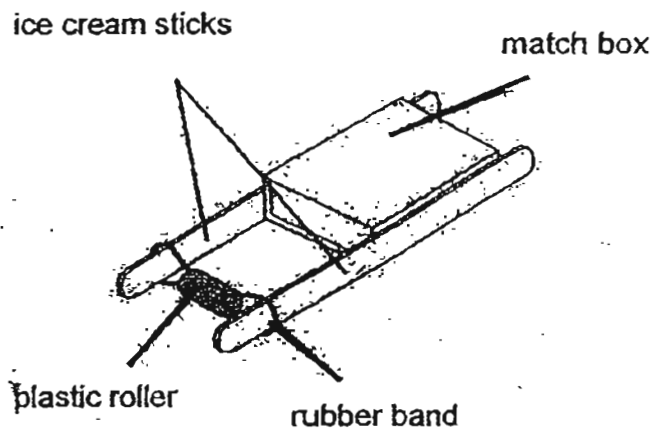


When viewed from position X, the opaque object was seen clearly.
When viewed from position Y, the opaque object was seen as a blurred image.

Which of the following are the materials of the screens, A, B and C?

	A	B	C
(1)	frosted paper	clear glass	plastic sheet
(2)	clear glass	cardboard	plastic sheet
(3)	plastic sheet	cardboard	clear glass
(4)	plastic sheet	clear glass	frosted paper

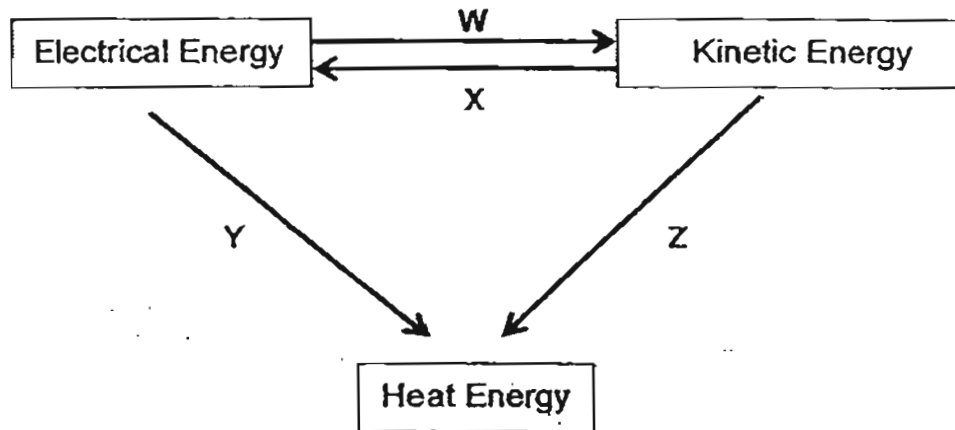
18. Khairul made a toy as shown in the diagram below. When he turned the plastic roller and then released the toy on a table, the toy moved a distance before coming to a stop.



Describe the energy changes from the time Khairul released the toy until it stopped.

- (1) potential energy \longrightarrow heat energy + sound energy
- (2) kinetic energy \longrightarrow heat energy + sound energy
- (3) potential energy \longrightarrow kinetic energy \longrightarrow heat energy + sound energy
- (4) kinetic energy \longrightarrow potential energy \longrightarrow heat energy + sound energy

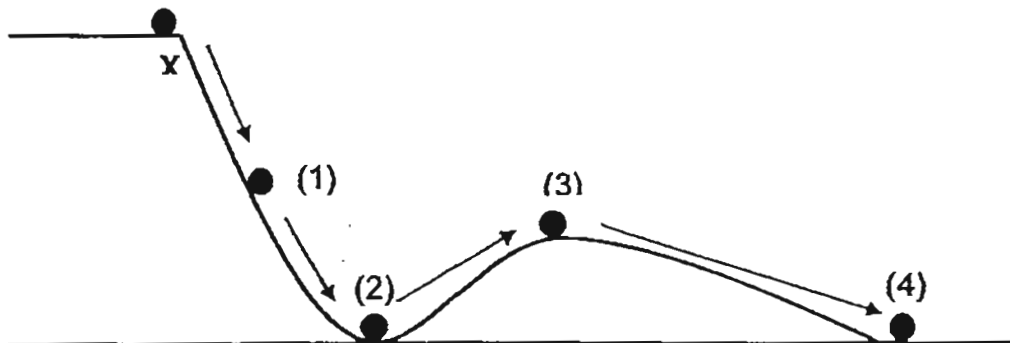
19. In the diagram below, different energy changes are represented by the arrows, W, X, Y and Z. Only the useful forms of energy are considered.



Which of the following will bring about the energy changes represented by the arrows?

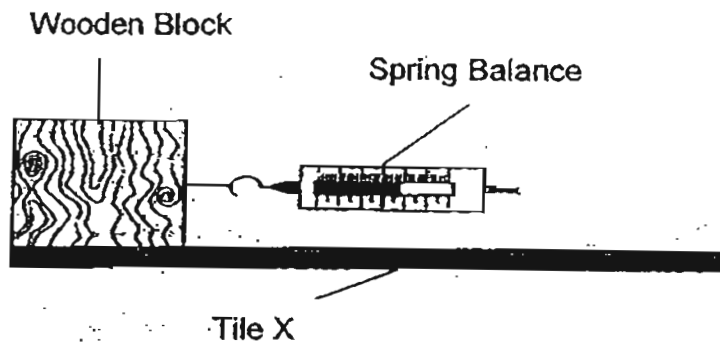
	W	X	Y	Z
(1)	Running an electric motor	Operating a turbine	Switching on an oven toaster	Rubbing your hands together
(2)	Turning on an air-conditioner	Pressing a doorbell	Switching on an oven toaster	Striking a matchstick
(3)	Turning on an air-conditioner	Operating a turbine	Turning on a lamp	Striking a matchstick
(4)	Running an electric motor	Pressing a doorbell	Turning on a lamp	Rubbing your hands together

20. A ball, starting at point X, rolls down the hill as shown in the diagram below.

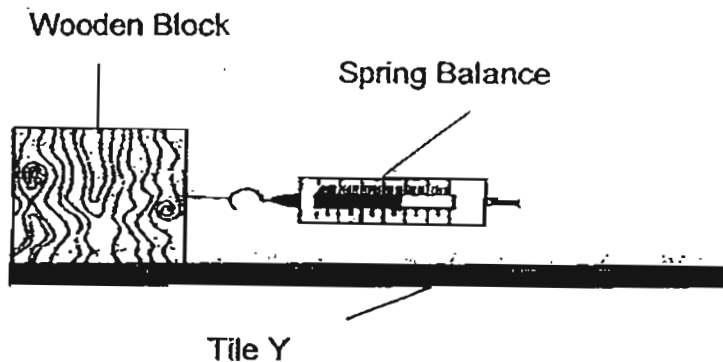


At which point, does the ball have maximum kinetic energy?
(Ignore friction)

21. Alec pulled a wooden block horizontally along tile X using a spring balance. He recorded the amount of force needed to move the wooden block over 100cm.



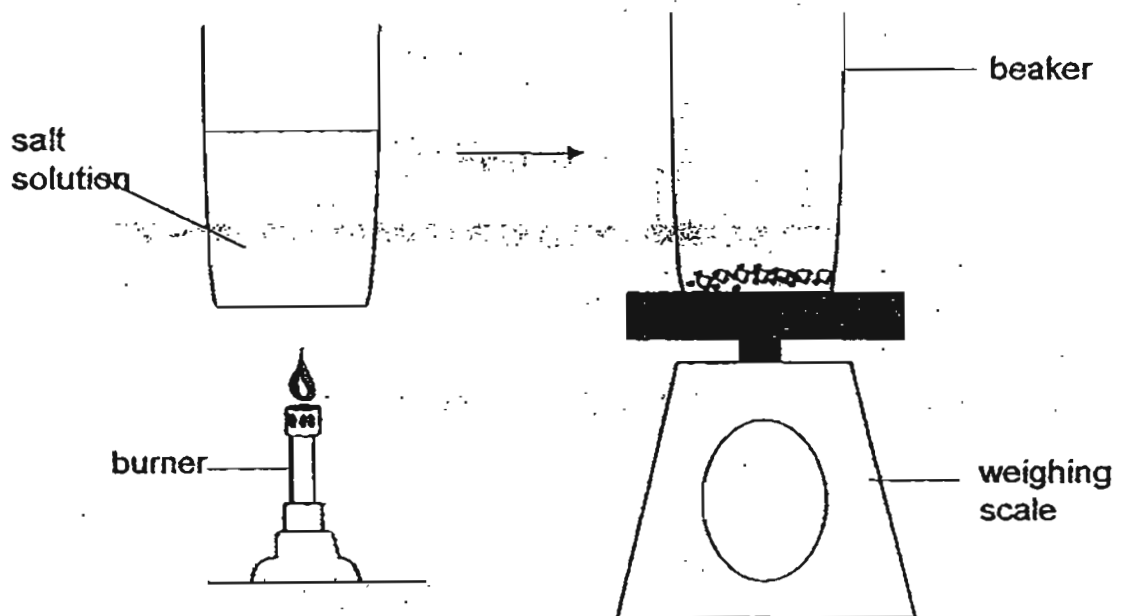
Alec repeated the activity with the same wooden block on tile Y.



What is the aim of his experiment?

- (1) To find out how the texture of the tile affects the pulling force.
- (2) To find out how the mass of the wooden block affects the pulling force.
- (3) To find out how the texture of the tile affects the distance moved by the wooden block.
- (4) To find out how the mass of the wooden block affects the distance moved by the wooden block.

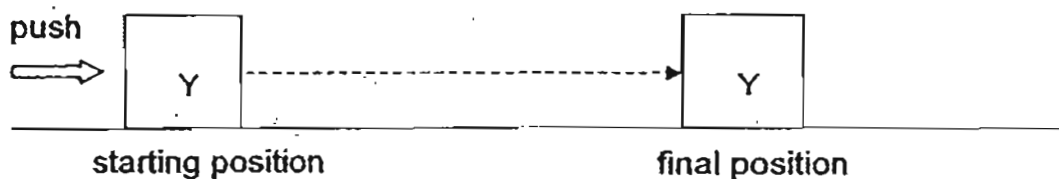
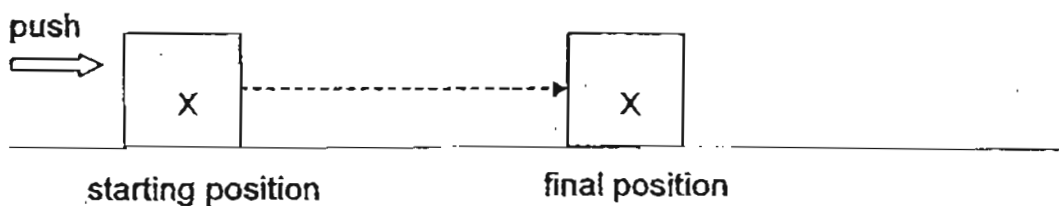
22. Joseph stirred 80g of salt into a beaker containing 200g of water until all the salt had dissolved. The beaker weighs 300g when empty. Next, he placed the beaker of salt solution on a burner to evaporate all the water in the beaker. Then he placed the beaker on a weighing scale.



What is the reading on the weighing scale?

- (1) 80g
- (2) 280g
- (3) 380g
- (4) 580g

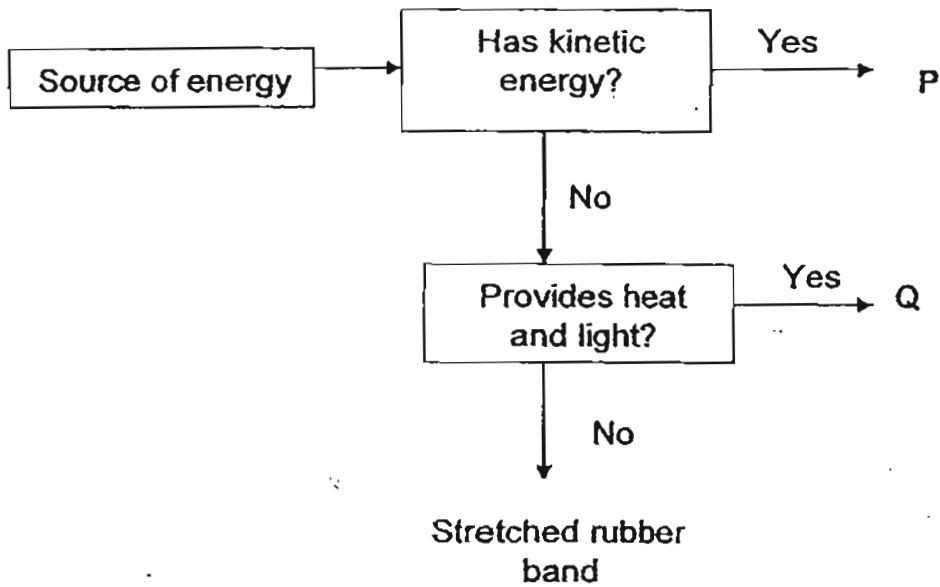
23. Two objects, X and Y, of the same size, were pushed with an equal amount of force on the same surface. The starting positions and final positions are shown below.



What can you infer from the activity?

- (1) Object X has a greater mass than object Y.
- (2) Object X has a greater volume than object Y.
- (3) The gravity acting on object X is greater than the gravity acting on object Y.
- (4) The surface on which object X was pushed is rougher than the surface on which object Y was pushed.

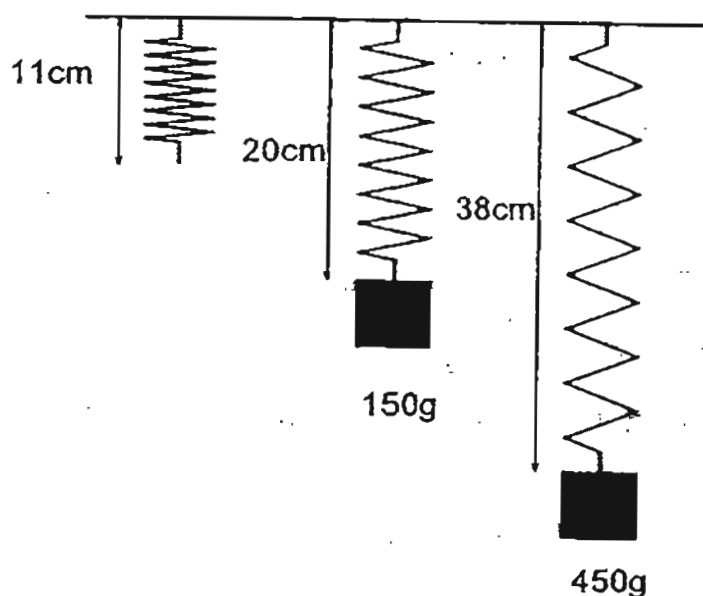
24. Study the flowchart below. P and Q are sources of energy.



What can P and Q be?

	P	Q
(1)	Sun	Burning of fuel
(2)	Wind	Running water
(3)	Running water	Sun
(4)	Burning of fuel	Wind

25. A 150g load was hung from a spring. The length of the spring was measured and recorded in the table below. The activity was repeated with a 450g load.

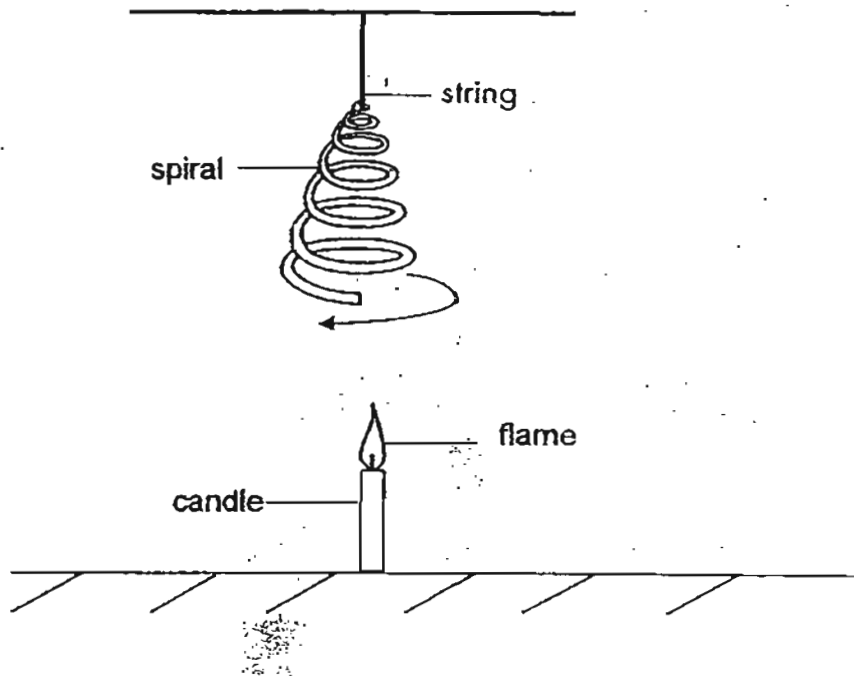


Load hung on the spring (g)	Length of spring (cm)
0	11
150	20
450	38

What is the length of the spring when a 600g load was hung from it?

- (1) 9 cm
- (2) 18 cm
- (3) 47 cm
- (4) 58 cm

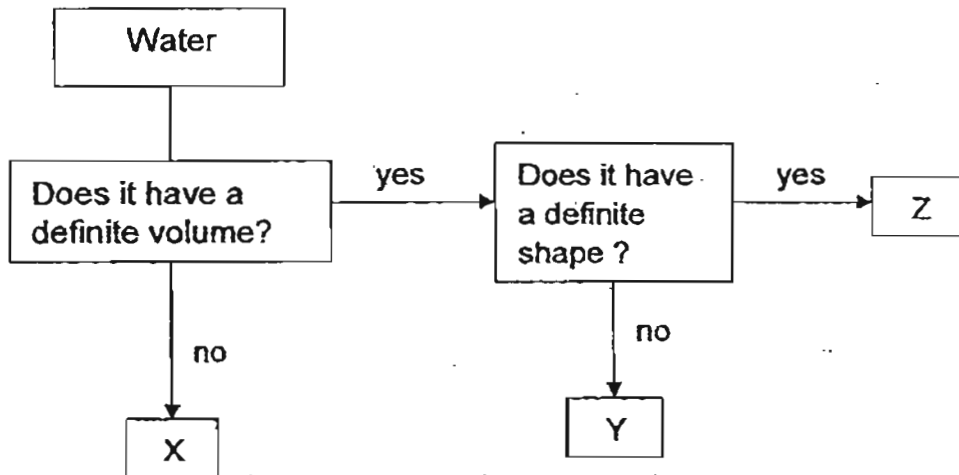
26. Muthu hung a paper spiral above a candle. The spiral began to spin.



Which of the following shows the correct energy conversion and energy transfer?

(1)	potential energy (of flame)	→	heat energy (of hot air)	→	potential energy (of spiral)
(2)	heat energy (of flame)	→	kinetic energy (of hot air)	→	kinetic energy (of spiral)
(3)	light energy (of flame)	→	heat energy (of hot air)	→	potential energy (of spiral)
(4)	chemical energy (of flame)	→	kinetic energy (of hot air)	→	kinetic energy (of spiral)

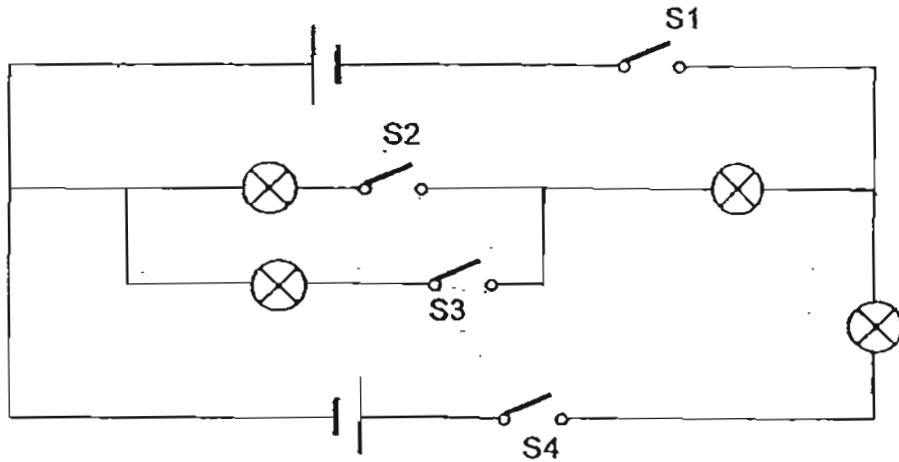
27. Study the flow chart below.



X, Y and Z are the different states of water. Identify X, Y and Z.

	X	Y	Z
(1)	Gas	Liquid	Solid
(2)	Liquid	Solid	Gas
(3)	Solid	Gas	Liquid
(4)	Solid	Liquid	Gas

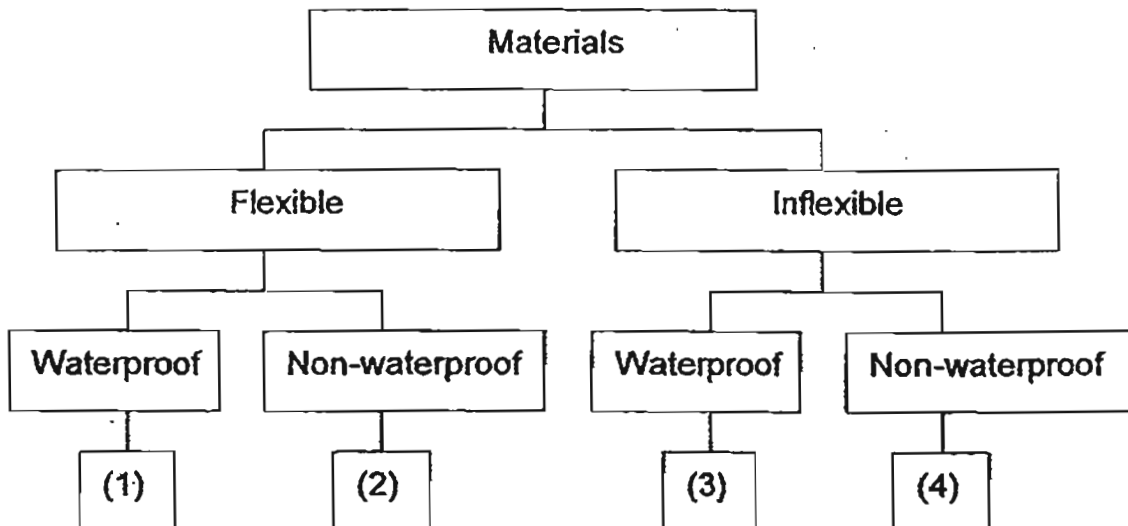
28. In the circuit below, the bulbs and batteries are in good working condition.



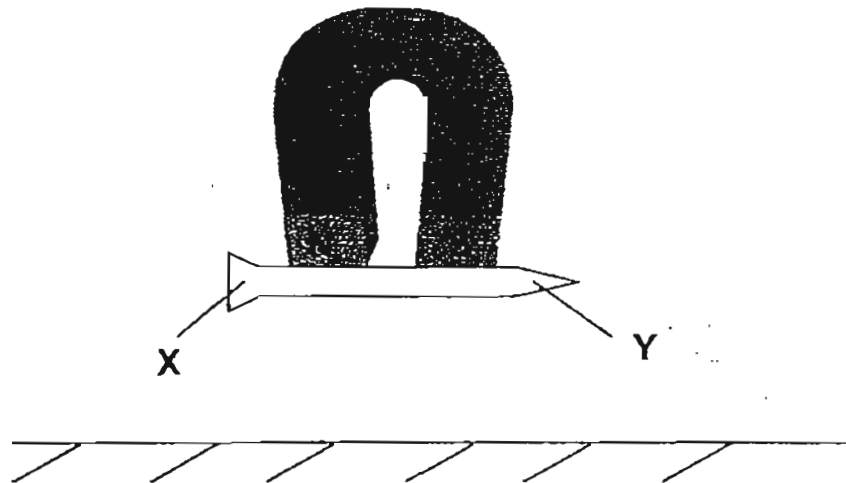
Which switches should be left open and which switches should be closed so that only one bulb will light up?

	S1	S2	S3	S4
(1)	open	closed	closed	open
(2)	closed	open	closed	open
(3)	open	closed	open	closed
(4)	closed	open	open	closed

29. The classification chart below shows the properties of four different materials. Which material is most suitable for making raincoat?



30. The diagram below shows a nail attracted by a U-shaped magnet.



Based only on the above, which of the following is **definitely** true?

- (1) Magnets can attract iron.
- (2) Magnetic force can act from a distance.
- (3) The N-pole repels Y and the S-pole repels X.
- (4) The N-pole attracts X and the S-pole attracts Y.

TAO NAN SCHOOL

PRIMARY SIX SCIENCE MID-YEAR EXAMINATION 2011

Booklet B

NAME : _____ ()

CLASS : Primary 6 ()

DATE : 12 May 2011

TOTAL TIME FOR BOOKLETS A & B: 1h 45min

BOOKLET B	/40
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Parent's signature: _____

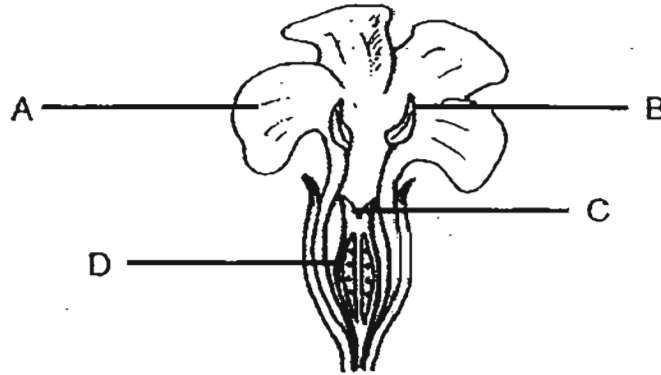
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Section B (40 marks)

Write your answers for the questions, 31 to 44, in the spaces provided.

31. The diagram below shows a flower of an animal-pollinated plant.

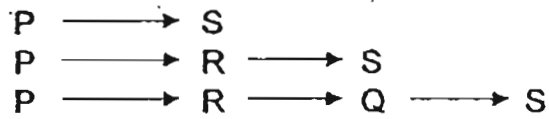


(a) Which part, A, B, C or D, produces pollen grains? [1]

(b) It was observed that part C was coated with a sticky substance. Identify part C and explain the function of the sticky substance. [2]

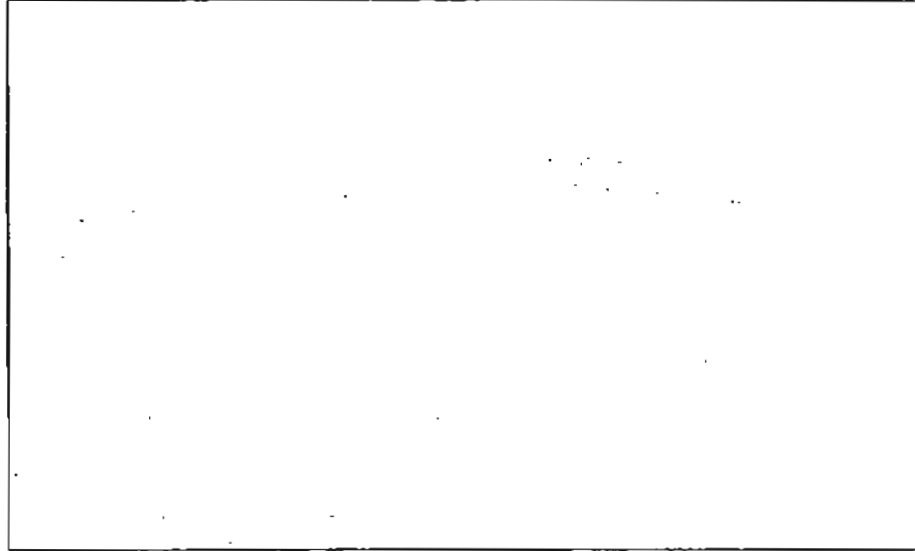
(c) What will happen to Part D after fertilisation? [1]

32. P, Q, R and S represent different types of organisms in a community. Three food chains showing their food relationships are given below.



- (a) Draw a food web based on the three food chains.

[1]



- (b) Which of the four types of organisms is an omnivore (plant and animal eater)?

[1]

- (c) Which of the four types of organisms is both a predator and a prey?

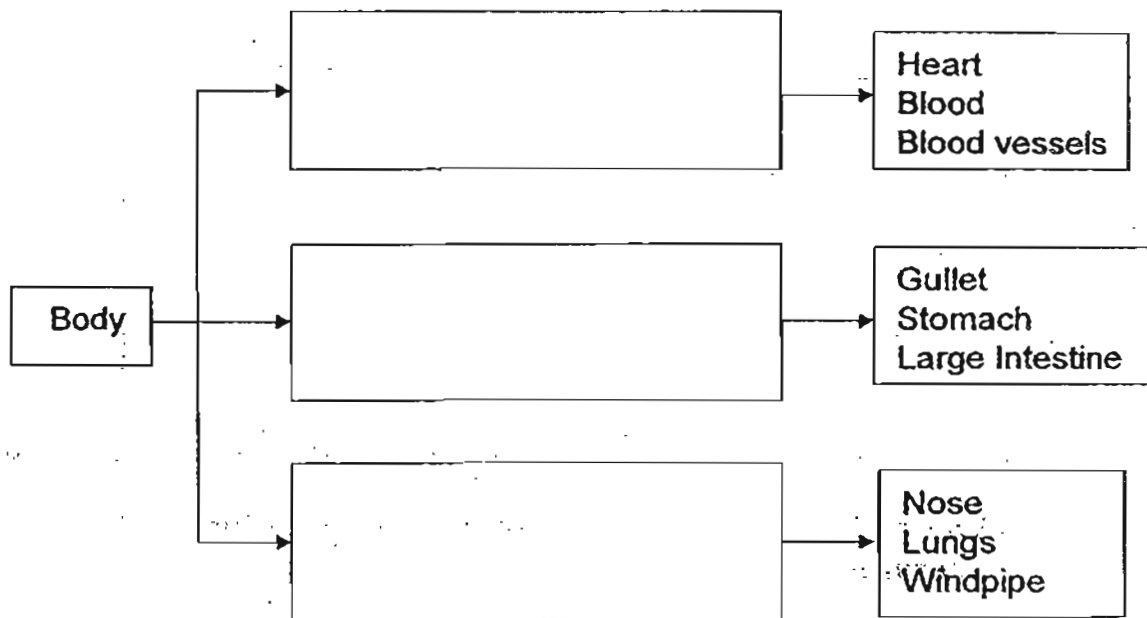
[1]

33. The parts of the body in the chart below are grouped according to the different body systems.

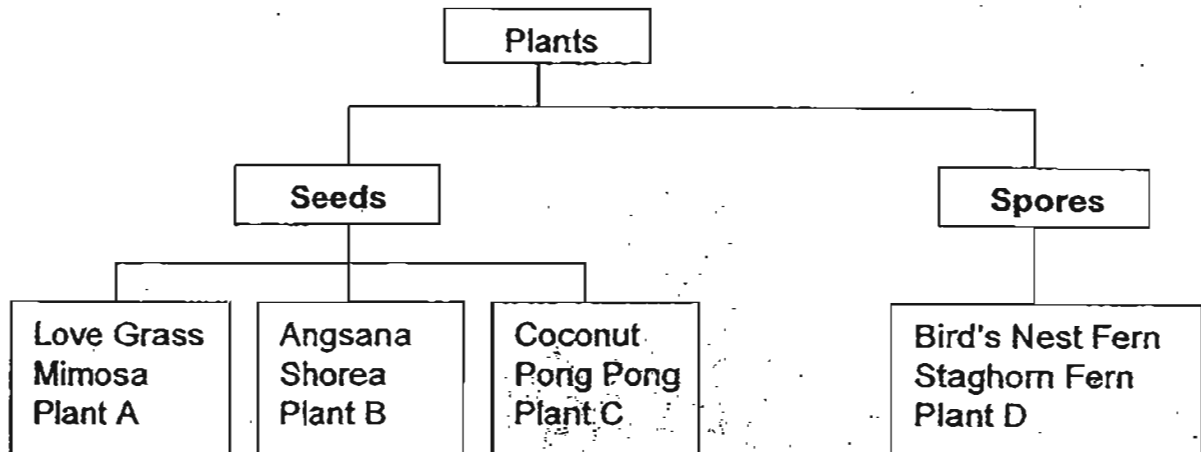
Complete the chart with the body systems given.

[3]

Digestive system, Respiratory System, Circulatory System



34. Study the classification chart below. The plants are grouped according to their method of reproduction and then by their method of dispersal.

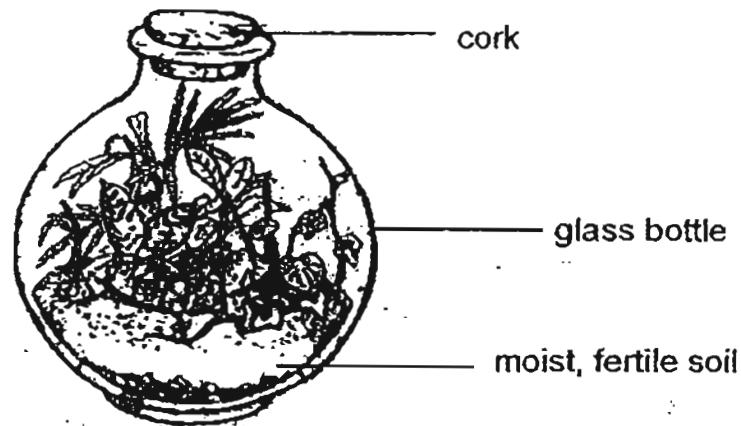


Put a tick (✓) in the correct box for each of the following.

[2]

		True	False	Not possible to tell
(a)	Plant A is pollinated by animals.			
(b)	Plant B has fruits which are attached to a feathery-like structure.			
(c)	Plant C is dispersed by water.			
(d)	Plant D reproduces by pollen.			

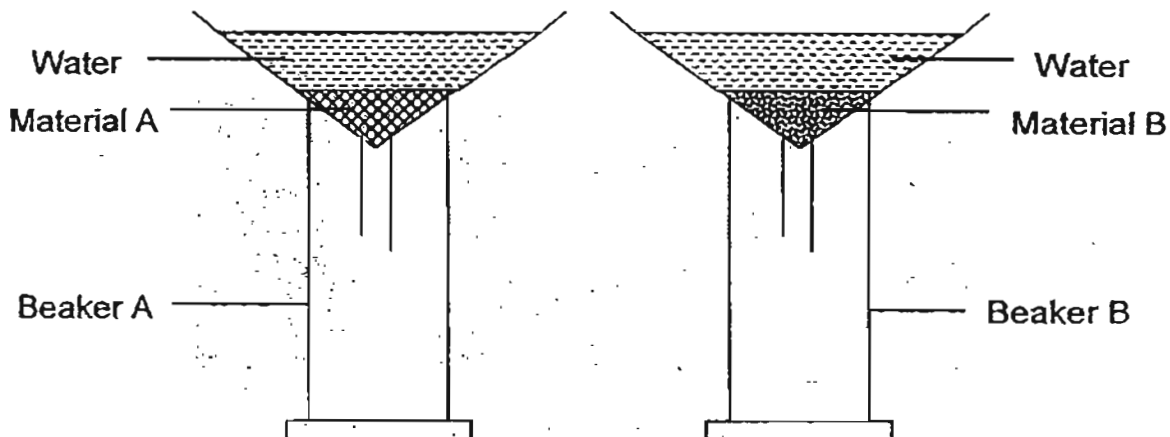
35. Amina set up a bottled garden and placed it outside the classroom near the windows where there is sufficient light. Three garden snails and five earthworms were placed in the bottle. The bottle was sealed with a tightly fitted cork.



(a) Besides getting food from the plants, how else do the snails depend on the plants to survive? [1]

(b) Although Amina did not water the plants after fitting the cork, the organisms were still able to obtain a continuous supply of water. Explain why. [2]

36. Two funnels containing equal volumes of Material A and Material B and an equal volume of water were left at room temperature as shown below.



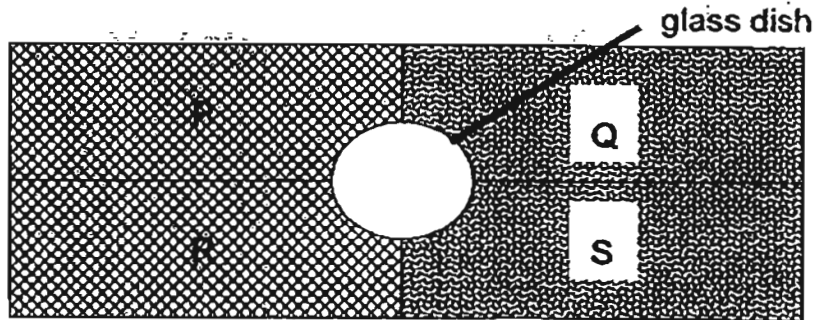
After 30 minutes, the volume of water in Beaker A and Beaker B were measured and the results were recorded in the table below.

	Volume of water before the activity (cm^3)	Volume of water after the activity (cm^3)
Beaker A	0	477
Beaker B	0	412

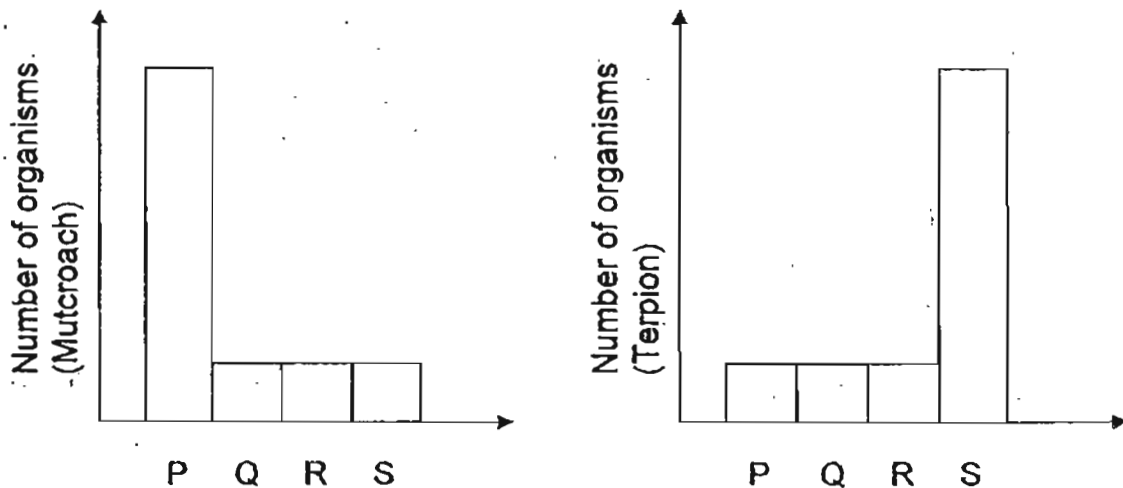
- (a) What was the aim of the experiment? [1]

- (b) Which was better at retaining more water, Material A or Material B? [1]

A tray with tiny holes at the bottom was divided into 4 equal sections, P, Q, R and S. A shallow glass dish was placed in the middle of the tray. Material A filled the sections, P and R, and Material B filled the sections, Q and S, as shown below.



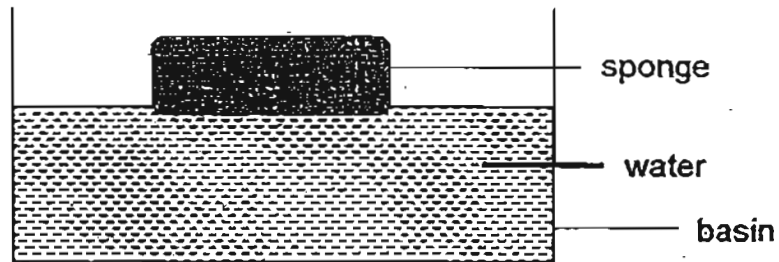
400ml of water was poured evenly on each section, P, Q, R and S. Next, a black cloth was used to cover the sections, R and S, and the set-up was placed under the sun. The same number of organisms, Mutcroach and Terpion were placed in the dish at the beginning of the experiment. After 8 hours, the total number of organisms in each section was counted and presented in the bar charts below.



(c) Describe the conditions Mutcroach prefers. [1]

(d) Describe the conditions Terpion prefers. [1]

37. A sponge was placed in a basin of water as shown below.



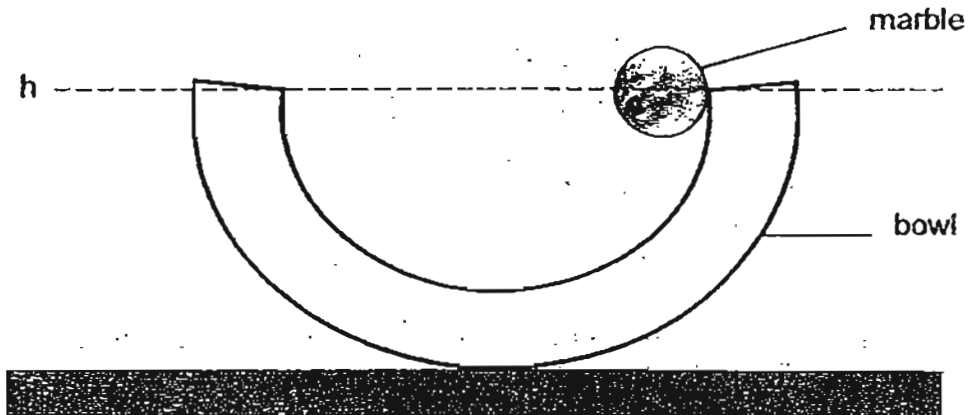
(a) When the sponge was pushed down into the water, bubbles escaped from the sponge. Explain why bubbles were observed in the above demonstration. [2]

(b) Water hyacinth plants are commonly found in ponds as shown below.



Explain how the water hyacinth plants are able to float on water. [1]

38. Javier released a marble from the side of a bowl as shown below.



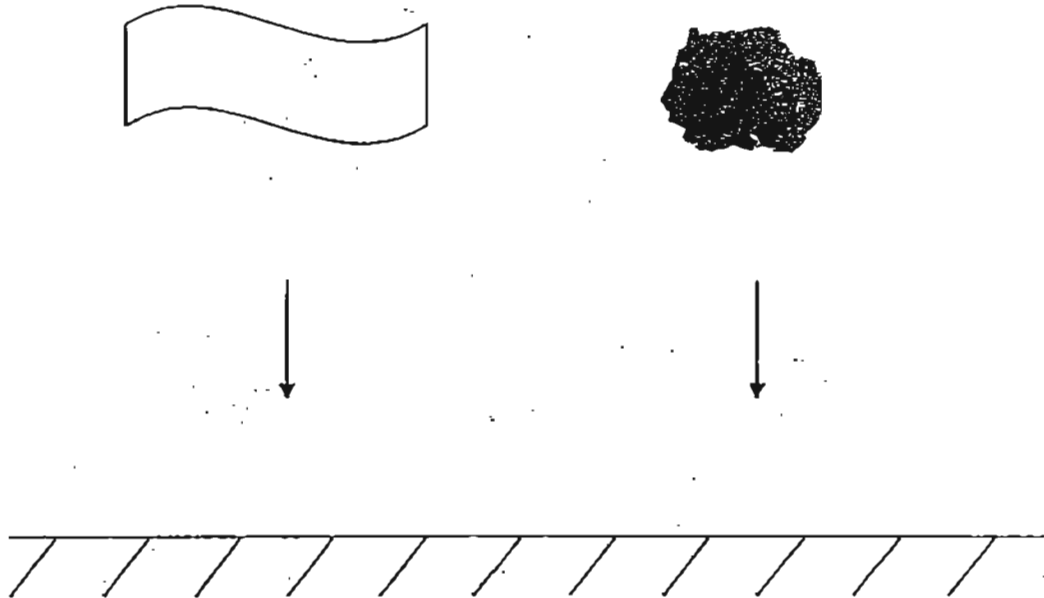
- (a) After the marble was released, Javier observed that it did not reach the original height, h . Explain why. [1]

- (b) Javier allowed a 100g marble to roll to and fro in the bowl for 10 seconds. He counted the number of oscillations (marble rolls from one end to another and back). He repeated the activity with a 200g marble and then a 300g marble. He recorded the results in the table below.

Mass of marble (g)	Number of oscillations
100	22
200	22
300	22

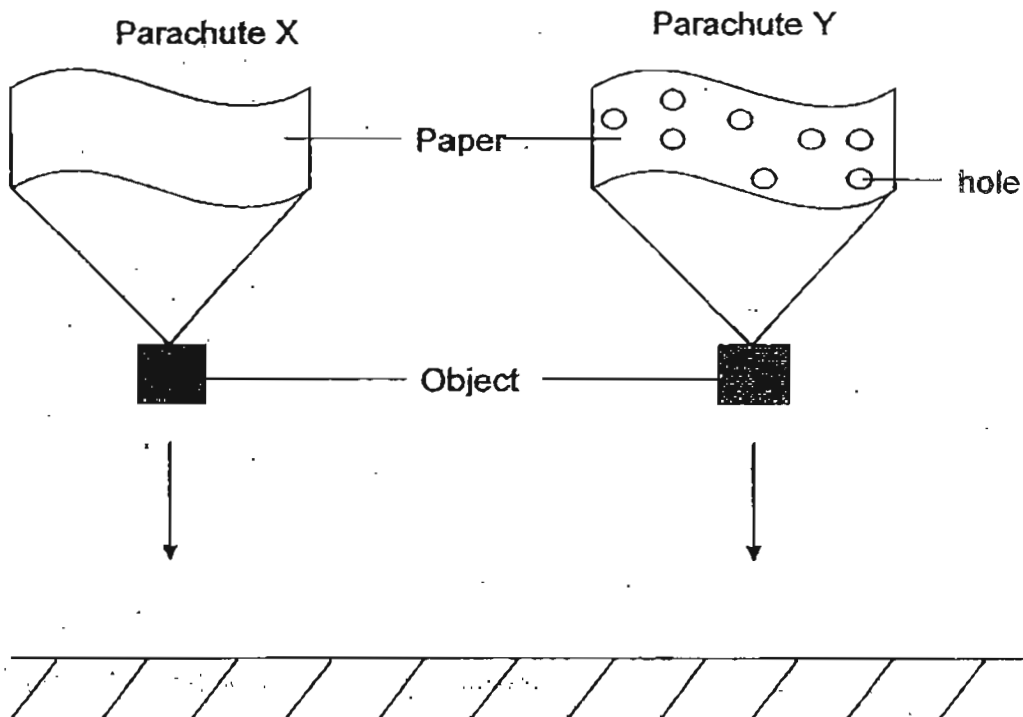
What is the relationship between the mass of the marble and the number of oscillations? [1]

39. Gavin used two identical pieces of paper for an investigation. He crushed one of the pieces of paper into a ball. Then he dropped both of the pieces of paper from the same height as shown below.



- (a) Gavin observed that the crumpled piece of paper reached the ground first. Explain why. [1]

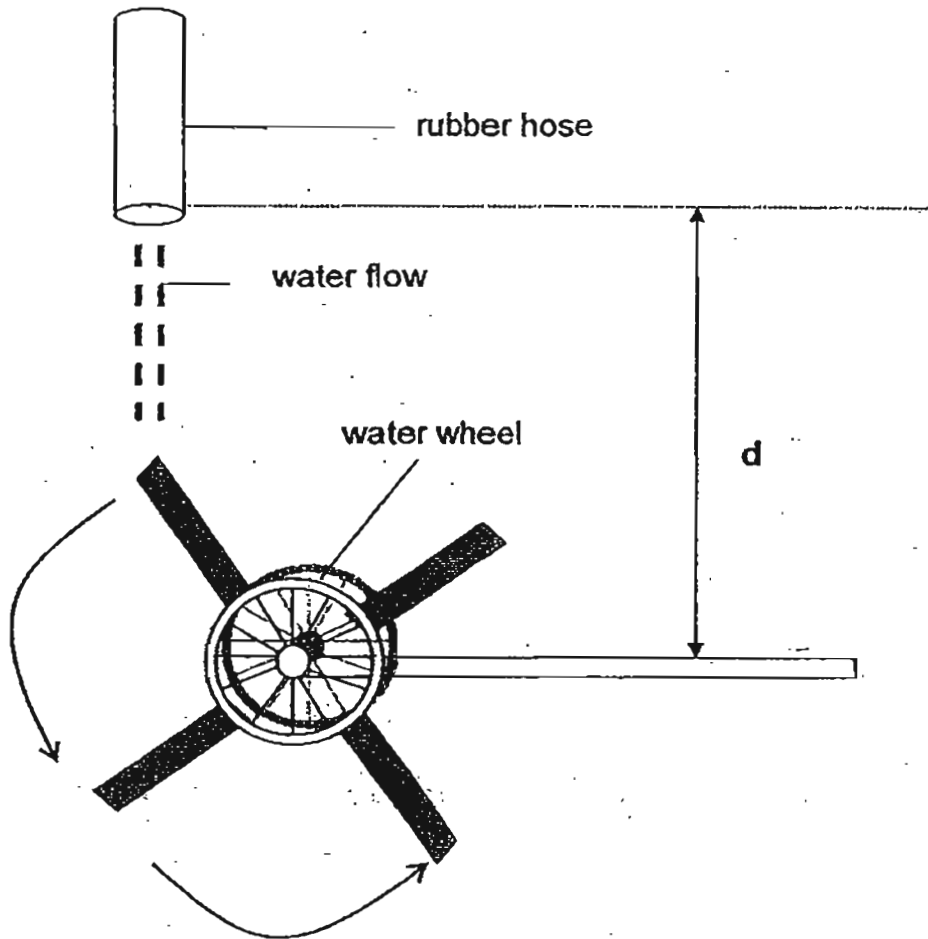
Gavin conducted another investigation using two identical pieces of paper. He made holes in one of the pieces of paper. He tied an object to each of these pieces of paper. He labelled the home made parachutes, X and Y. Then he dropped both parachutes from the same height as shown below.



(b) Predict whether Parachute X or Parachute Y would reach the ground first. [1]

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

40. Water flowed from a rubber hose onto a water wheel as shown in the diagram below.

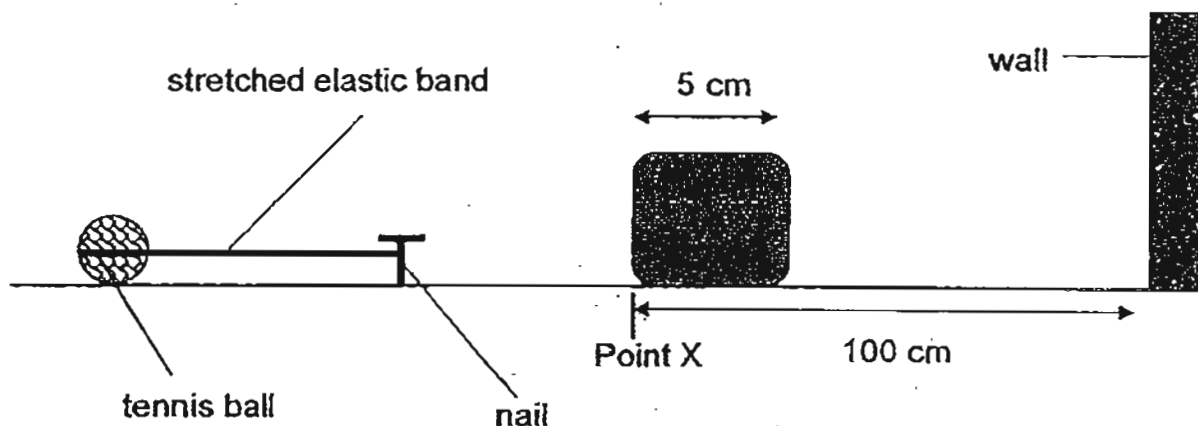


(a) Describe the energy changes as the water wheel rotates. [1]

_____ → _____ →
 (of the water) (of the flowing water)
 _____ + _____
 (of the spinning wheel)

(b) The water wheel rotated more slowly when distance d was reduced. Explain why. [2]

41. A group of students wanted to find out the effect of a stretched elastic band on the distance travelled by Object W. The set-up (not drawn to scale) was prepared as shown below. They measured the distance Object W moved from Point X after being hit by the tennis ball.



The results were recorded in the table below.

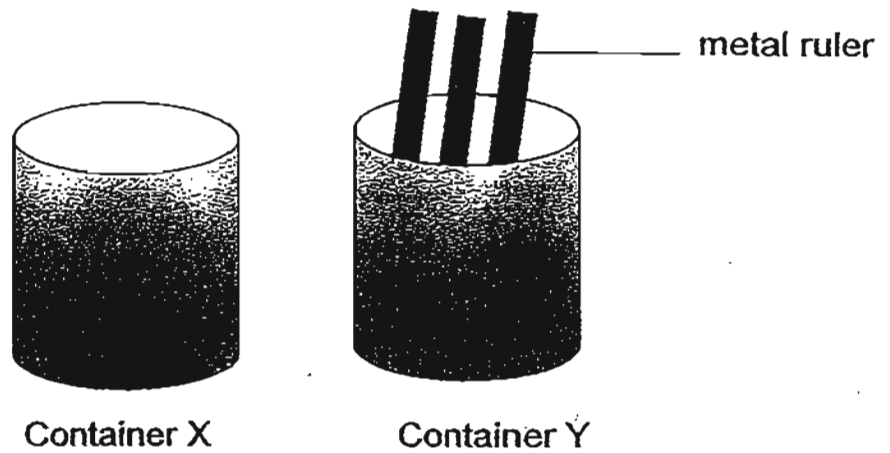
Length of the stretched elastic band (cm)	Distance moved by Object W (cm)		
	First try	Second try	Average distance
12	6.7	7.1	6.9
16	8.0	8.2	8.1
20	10.7	10.5	10.6

(a) What is the reason for performing two tries before calculating the average distance? [1]

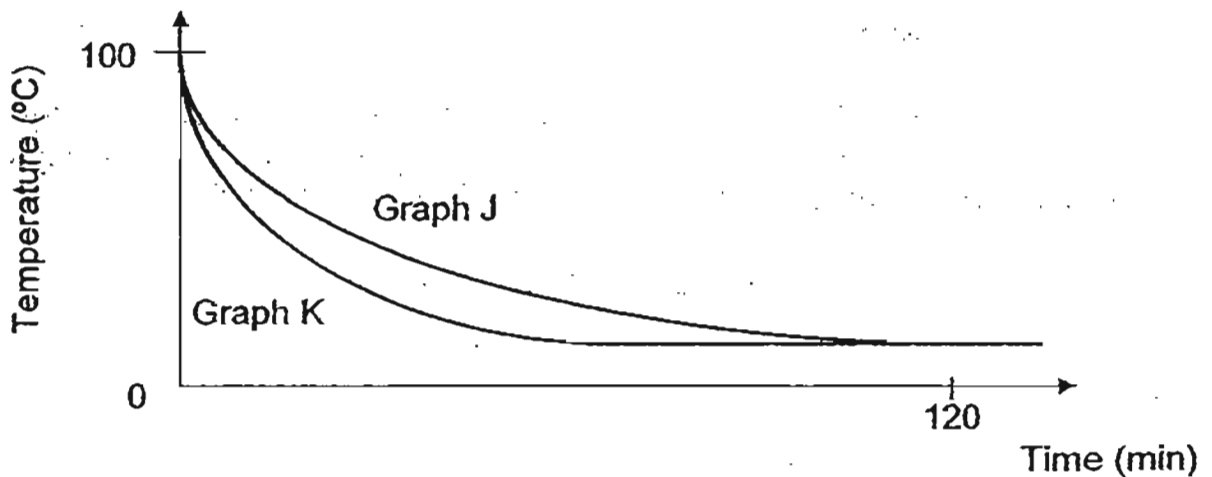
(b) What is the relationship between the length of the stretched elastic band and the distance moved by Object W? [1]

(c) When the length of the stretched elastic band was 20cm, predict the distance moved by Object W if it was fitted with 4 wheels at the base. [1]

42. The same amount of boiling water was poured into two identical containers, X and Y, and placed in a room.



The graph below shows the temperature of water in each container recorded over 120 minutes.



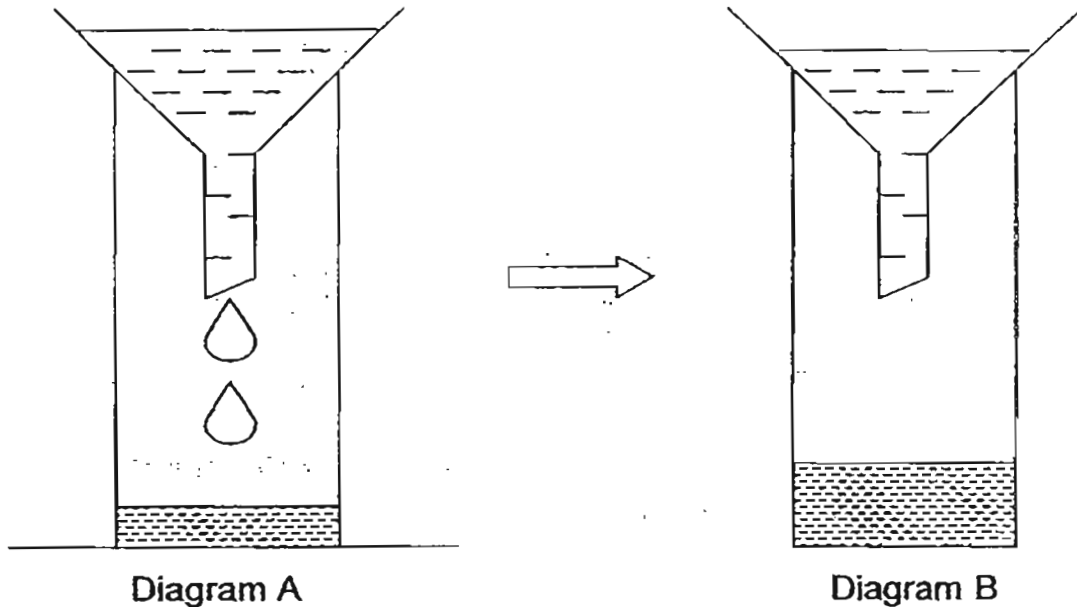
(a) Match the graphs, J and K, to the temperature of water as the water cool, in the containers, X and Y. [1]

Graph J – Container _____.

Graph K – Container _____.

(b) Explain your answer in (a). [1]

43. Sheng Siong poured 200ml of water into a funnel as shown below.



He noticed that some water flowed into the container as shown in Diagram A. However, after some time, he noticed that the water stopped flowing into the container as shown in Diagram B.

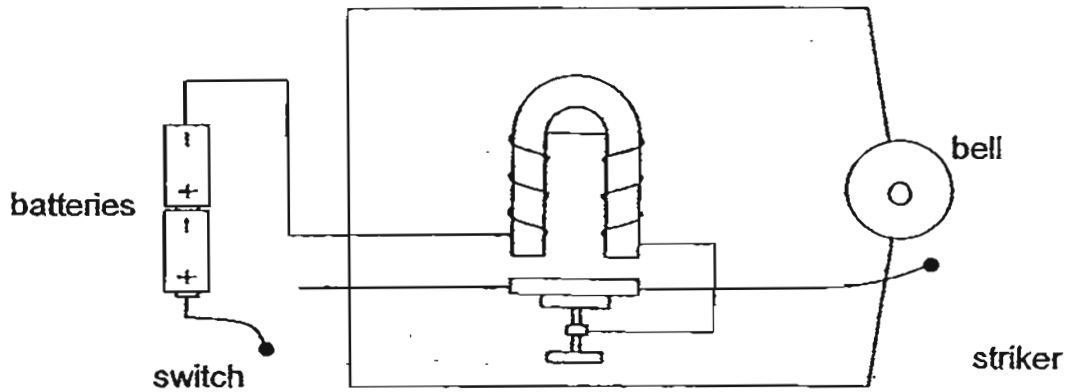
(a) Explain why some water entered the container.

[1]

(b) Explain why water stopped flowing into the container after some time.

[1]

44. The diagram below shows a simple door bell.



In the boxes below, write the energy changes that take place when the switch is closed. [2]

in batteries



in circuit



of striker



from bell

END OF PAPER

2011 SA1 Science
Answer key (Section A)

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

No	Suggested Answers	Remarks
31(a)	Part B	
31(b)	Part C is the stigma. [1] Pollen can be attached to / stick on part C [1]	Pollination can take place [1/2]
31(c)	Part D swells [1] (to become a fruit)	
32(a)	<pre> graph LR P --> S P --> R R --> S R --> Q </pre>	
32(b)	S	
32(c)	Q	
33	Circulatory system Digestive system Respiratory system	1m each
34(a)	Not possible to tell	½ m each
34(b)	Not possible to tell	
34(c)	True	
34(d)	False	
35(a)	The snails take in oxygen given out by plants when plants undergo photosynthesis.	
35(b)	Water in the soil evaporated into water vapour. [1] Water vapour condensed into water droplets when it met the cooler surface. [1]	
36(a)	To find out if material A or material B retains water better. [1]	Clue to pupils found in part (b)
36(b)	To find out if material A or material B retains more water. [1]	
36(c)	To find out if material A or material B allows more water to pass through it. [1] Material B	
36(d)	Dry and warm / brighter (place)	
		Should we accept

	Moist and dark	cooler? e.g. moist and cooler
37(a)	Sponge contains air space.[1] When squeezed, the air which occupied the space in the sponge escapes as bubbles. [1]	
37(b)	The plant contains air space [1/2] which makes it lighter than water.[1/2]	
38(a)	The potential energy possessed by the marble has been converted into (lost as) kinetic energy, sound energy and heat energy.[1]	
38(b)	The greater the mass of the marble, the number of oscillations remain the same. .[1]	
39(a)	Crushed ball has less surface area.[1/2] It would experience less air resistance [1/2]	Pupils must mention about the crushed ball and not the paper. The uncrushed paper has a greater surface area and experienced more air resistance. [1/2]
39(b)	Parachute Y would reach the ground first.	
39(c)	[1] OR The parachute with holes reach the ground first. Parachute Y has less surface area [1] It experienced less air resistance [1]	
40(a)	Gravitational potential energy (of the water) Kinetic energy (of the flowing water) Kinetic energy + sound energy (of the spinning wheel)	Pupils must make a comparison.
40(b)	Water has less potential energy so the flowing water has less kinetic energy [1] OR Less potential energy is converted into less kinetic energy in the water[1]	
41(a)	To ensure a reliable result / consistent reading. [1]	
41(b)	The longer the length of the rubber band,	

41(c)	<p>the greater the distance moved by object Y.[1]</p> <p>Any distance greater than 10.5 cm but less than 95 cm.</p>	
42(a)	Graph J - Container X Graph K - Container Y	
42(b)	<p>The metal rulers conducted more heat away from the water in container Y. [1/2] Hence the water (in Y) lost heat faster. [1/2]</p>	
43(a)	<p>Water occupied the space in the beaker as air can be compressed easily. [1] OR Water occupied the space in the beaker as air can has no definite volume..</p>	
43(b)	<p>There was no more space for the water to occupy inside the beaker. [1]</p>	
44(a)	<p>Chemical potential energy (battery) Electrical energy (circuit) Kinetic energy (striker) Sound energy (bell)</p>	