METHODIST GIRLS' SCHOOL

Founded in 1887

PRELIMINARY EXAMINATION 2012
PRIMARY 6
SCIENCE

BOOKLET A1

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

INSTRUCTIONS TO CANDIDATES

Do not turn over this page until you are told to do so.
Follow all instructions carefully.
Answer all questions.
Shade your answers in the Optical Answer Sheet (OAS) provided.

Name: _____ ( )

Class: Primary 6._____

Date: 27 August 2012

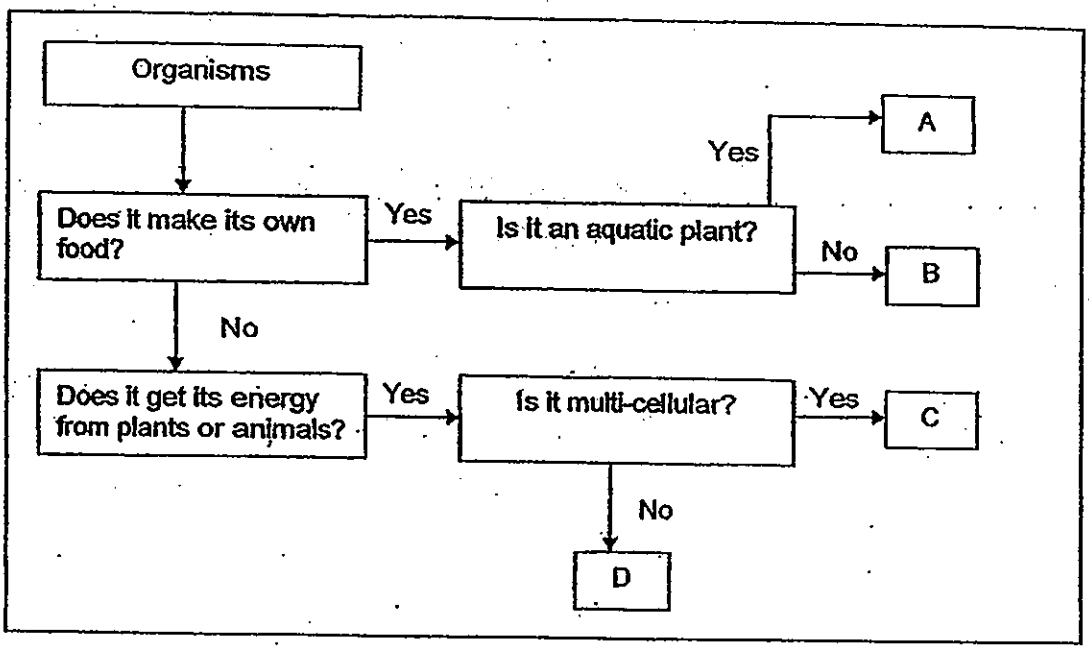
This booklet consists of 14 printed pages including this page.

(Go on to the next page)

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

(60 marks)

1. Study the flow chart below.



Based on the flowchart, which one of the following best represents A, B, C and D?

	A	B	C	D
(1)	Elodea	Fern	Mushroom	Amoeba
(2)	Water Lily	Mimosa	Yeast	Mushroom
(3)	Water Lily	Cattail	Chicken	Paramecium
(4)	Elodea	Mimosa	Yeast	Mushroom

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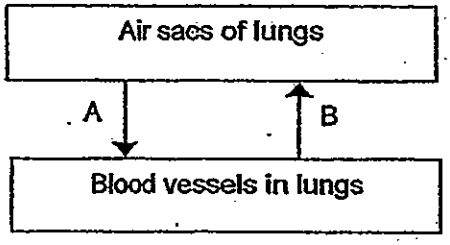
2. The following describes the stages of growth of a seedling.

A: Green leaves appear.
B: The seed coat breaks.
C: The shoot grows upwards
D: The root grows downwards
E: The seed leaves start to shrivel

Which of the following shows the correct sequence for the growth of a seedling?

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

3. The diagram below shows the flow of substances A and B in the human lungs during respiration.



Which one of the following correctly shows substances A and B?

	A	B
(1)	Oxygen	Carbon dioxide + Water vapour
(2)	Oxygen	Glucose + carbon dioxide
(3)	Carbon dioxide	Water vapour + glucose
(4)	Carbon dioxide	Oxygen + water vapour

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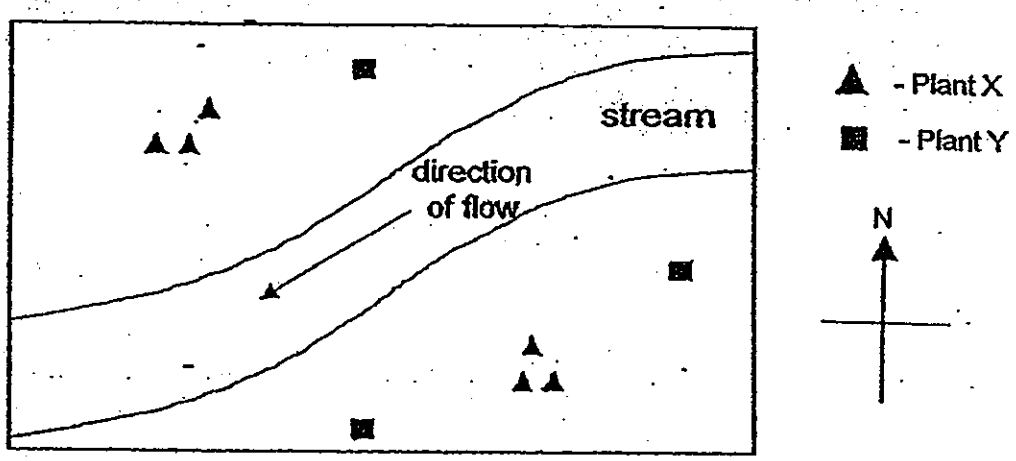
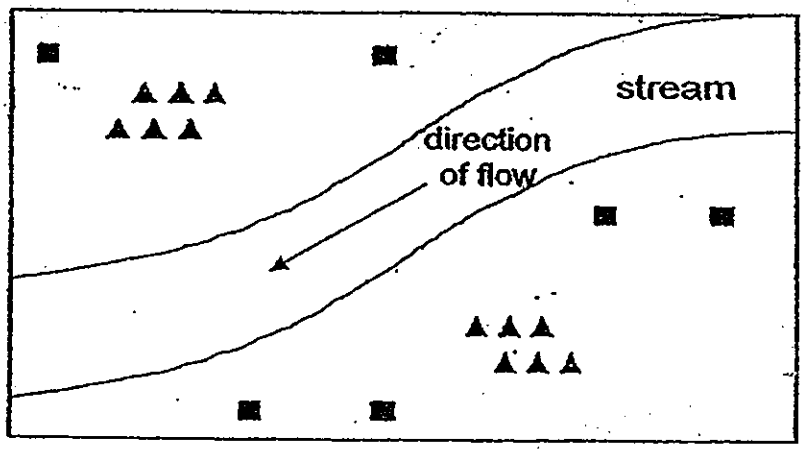
4. The diagram below shows the location of Plant X and Y along the river side. The arrow indicates the direction of water flow in the river. The wind blew from the east for a long period of time.



After 1 year, more plants of the same kind are seen growing on other areas as shown in the diagram below.



Which one of the following sets of plants is most likely to be X and Y?

	Plant X	Plant Y
(1)	Rambutan	Lalang
(2)	Rubber	Angsana
(3)	Love grass	African tulip
(4)	Flame of the forest	Coconut

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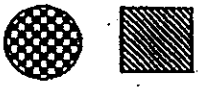
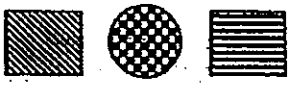
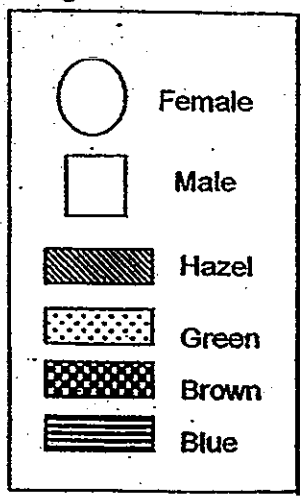
5. The table below shows some children who inherited the eye colour from their parents.

Family	Eye Colour (Parents)	Eye Colour (Children)
P		
Q		
R		
S		

Legend



Based on the information above, which one of the following statements is correct?

(1) If one parent has green eyes, all the sons will have green eyes.

(2) If the mother has green eyes, all her daughters will have green eyes.

(3) If the father has hazel eyes, at least one of the children will have hazel eyes.

(4) If one parent has blue eyes, there is a 50% chance that her children have blue eyes.

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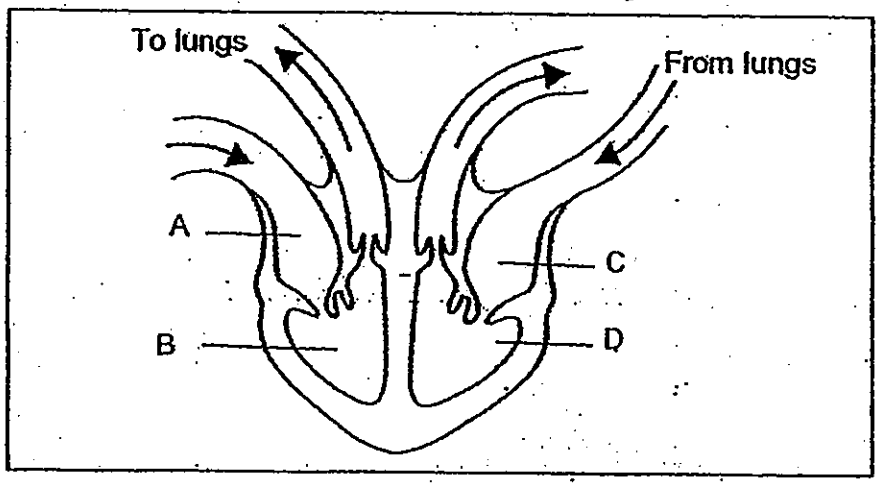
6. The diagram below shows the circulation of blood in a human heart. Blood samples were taken and examined at parts A, B, C and D of the heart.



Based on the diagram above, which one of the following correctly describes the blood found in parts A, B, C and D?

	A	B	C	D
(1)	Rich in oxygen	Rich in oxygen	Poor in oxygen	Poor in oxygen
(2)	Rich in oxygen	Poor in oxygen	Rich in oxygen	Poor in oxygen
(3)	Poor in oxygen	Poor in oxygen	Rich in oxygen	Rich in oxygen
(4)	Poor in oxygen	Rich in oxygen	Poor in oxygen	Rich in oxygen

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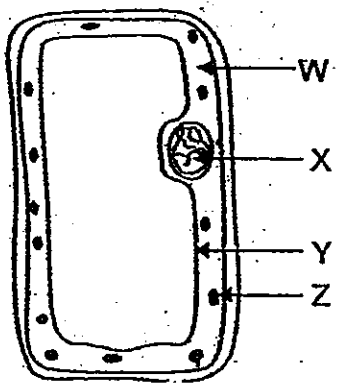
7. A team of bio-engineers wants to use genetic engineering to modify a certain fruit tree so that the fruits will be fleshier and more resistant to pests. The following diagram shows a sample of a cell from the plant.



Which one of the following correctly shows the part (s) of the cell to be modified?

(1) W
(2) X
(3) W, X and Y
(4) All of the above

8. Four students made some statements about reproduction of animals.

Andy: Asexual reproduction only occurs in micro-organisms.
Betty: More than one egg can be released from the ovary at the same time.
Cathy: Fertilisation can take place in the fallopian tube of the female's body.
Dorothy: Identical twins are produced only when two eggs are fertilized.

Which student(s) make the wrong statement(s)?

(1) Andy
(2) Betty and Cathy
(3) Andy and Dorothy
(4) Betty, Cathy and Dorothy

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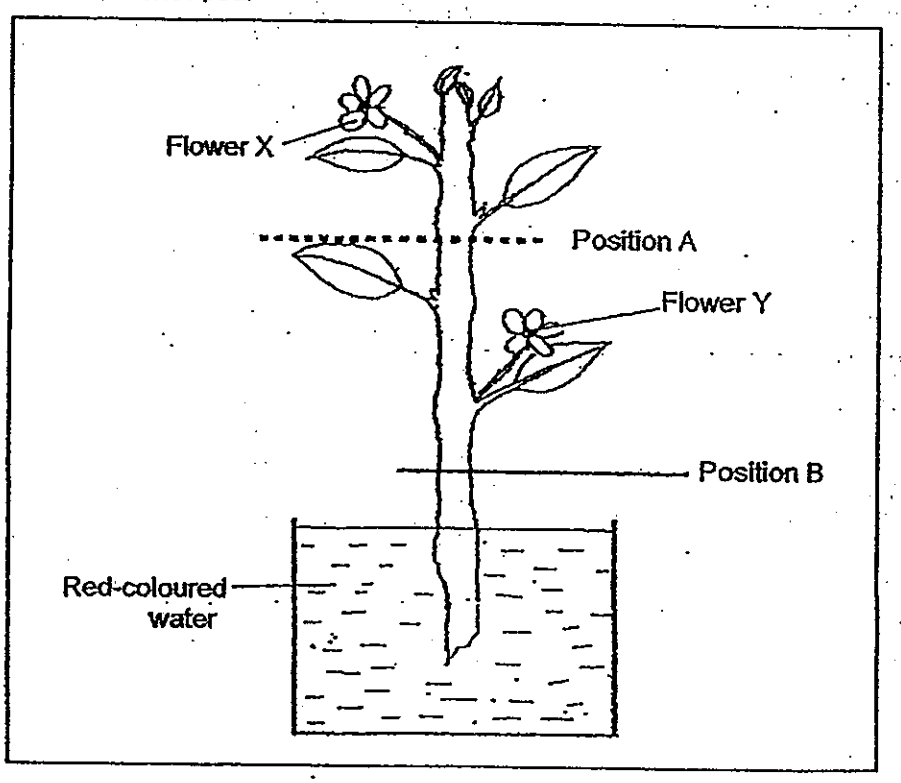
9. Bridgette placed a plant with two white flowers X and Y, into a beaker of red-coloured water. She removed a ring of the stem from position A and B as shown in the diagram below. After a few hours, Flower X remained white while Flower Y turned red.



Based on Bridgette's observation, which tubes were likely to be removed at Position A and B?

	Tube(s) removed at Position A	Tube(s) removed at Position B
(1)	Water-carrying tubes	Water-carrying and food carrying tubes
(2)	Food-carrying tubes	Water-carrying tubes
(3)	Water-carrying and food carrying tubes	Food-carrying tubes
(4)	Food-carrying tubes	Water-carrying and food carrying tubes

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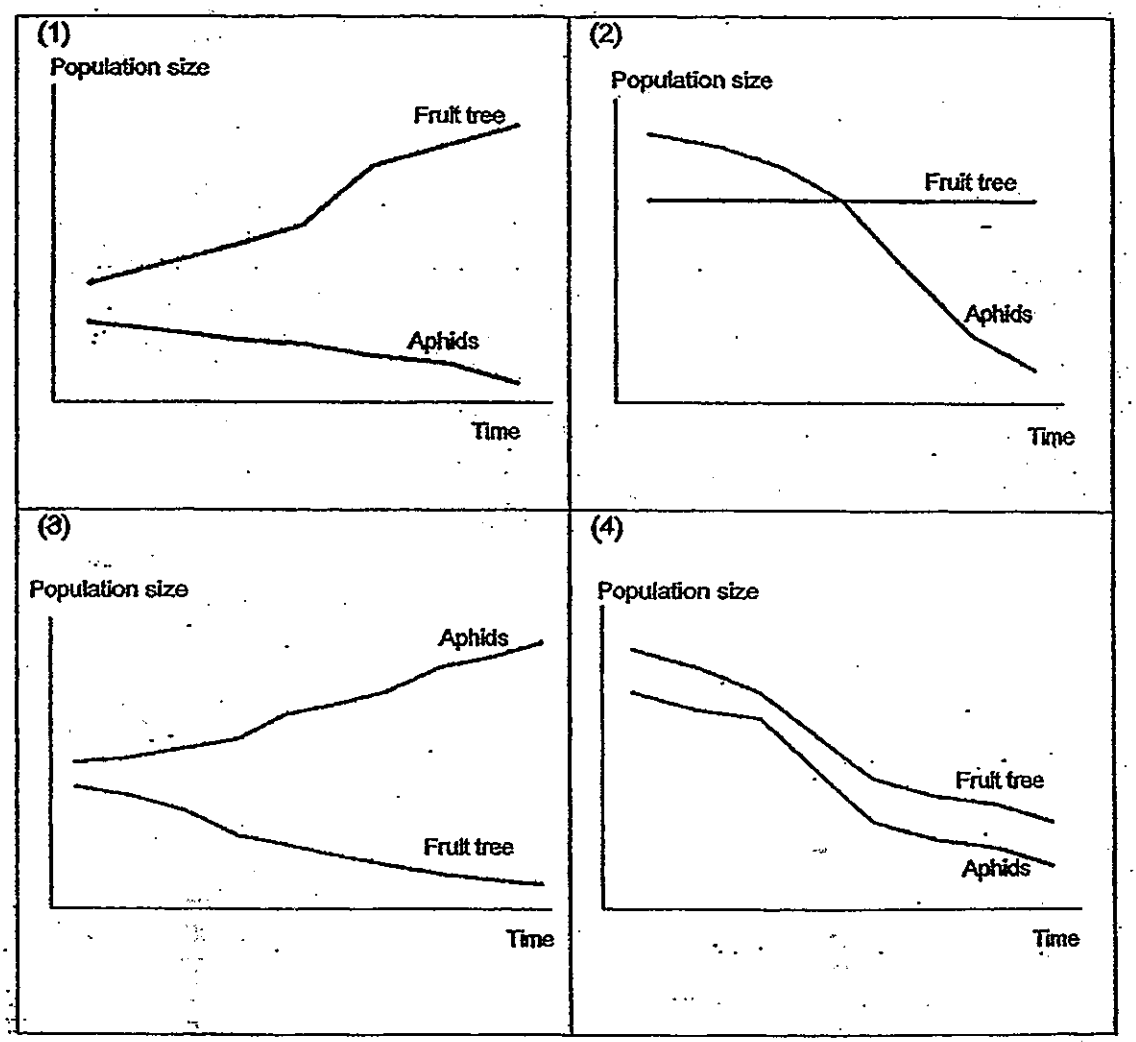
10. Farmer Brown's fruit trees were attacked by aphids. To overcome this problem, he introduced some ladybirds to get rid of the aphids.

Which one of the following graphs correctly shows the relationship between the population of fruit trees and aphids when the population of ladybirds increases in Farmer Brown's farm?



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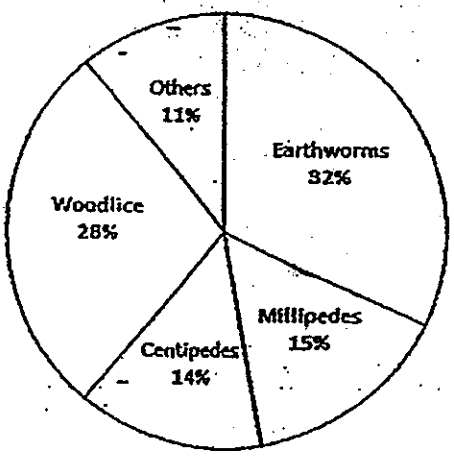
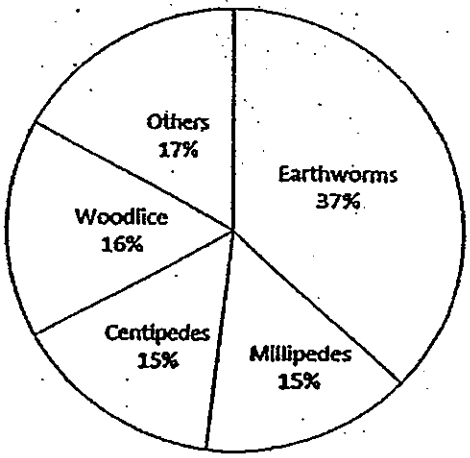
11. The following pie charts show the types and percentages of animals in a rotting log and leaf litter community.



Rotting log community



Leaf litter community

Based on the charts, which of the following statement is/are true?

A: There are more woodlice than centipedes in both communities.

B: There is an equal number of organisms for both communities.

C: The number of centipedes is the lowest for both communities

D: The number of centipedes in the rotting log community is the same as the number of millipedes in the leaf litter community.

(1) A only

(2) A and C

(3) B and D

(4) B, C and D

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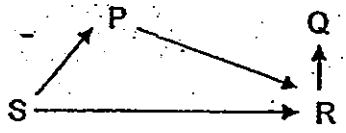
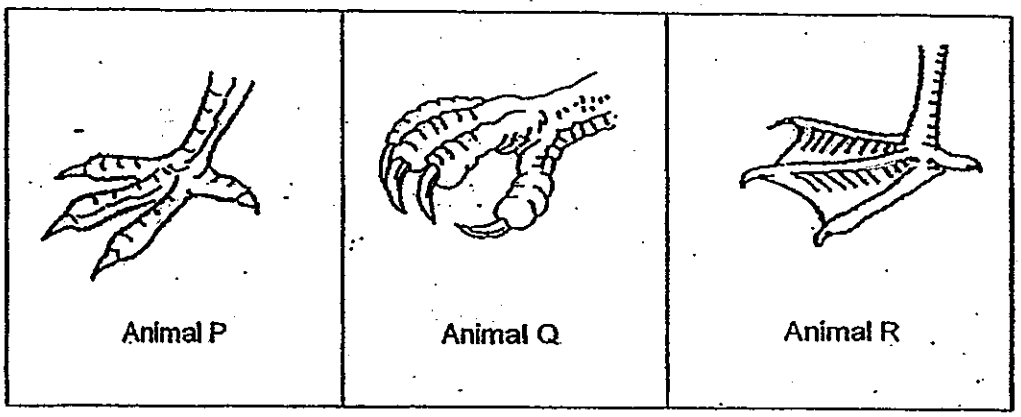
12. Study the following food web and feet structures of Animal P, Q and R.





Which of the following correctly shows the correct classification of Animal P, Q and R?

	Animals					
	Herbivore		Carnivore		Omnivore	
	In water	On land	In water	On land	In water	On land
(1)		P		Q	R	
(2)	P			R		Q
(3)		R		Q		P
(4)		P		R		Q

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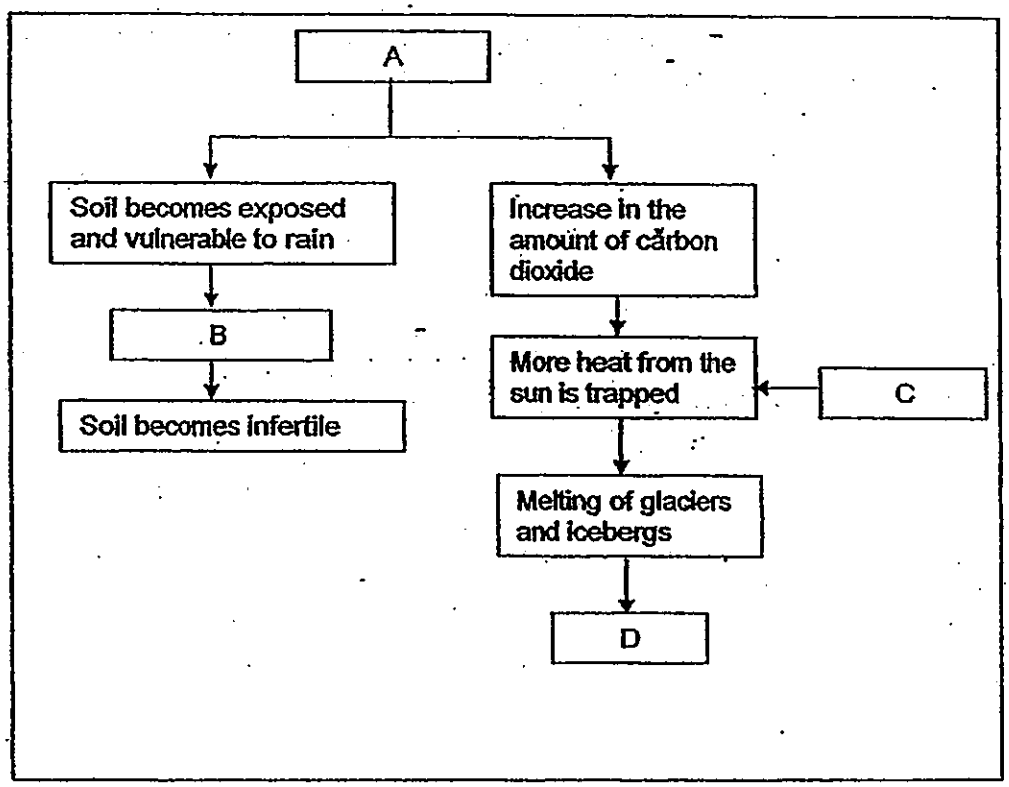
13. The flow chart below shows some human activities and their undesirable effects on Earth.



Which one of the following could represent A, B, C and D correctly?

	A	B	C	D
(1)	Deforestation	Soil erosion	Global warming	Increase in sea level
(2)	Burning of fossil fuels	Soil erosion	Greenhouse effect	Increase in sea level
(3)	Deforestation	Acid rain	Greenhouse effect	Flooding
(4)	Burning of fossil fuels	Acid rain	Global warming	Flooding

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14. Jane observed the breathing methods of some organisms in a pond and recorded them in the following table.

	Gills	Gill Chamber	Moist skin	Air bubbles	Breathing Tube
Tadpole	√				
Mudskipper		√	√		
Backswimmer					√
Water scorpion					√
Dragonfly nymph	√				
Great diving beetle				√	

Which of the following group of organisms is <u>incorrectly</u> matched to their breathing method?

(1) Mudskipper and water scorpion

(2) Mudskipper, backswimmer and water scorpion

(3) Mudskipper, dragonfly nymph and great diving beetle

(4) Water scorpion, dragonfly nymph and great diving beetle

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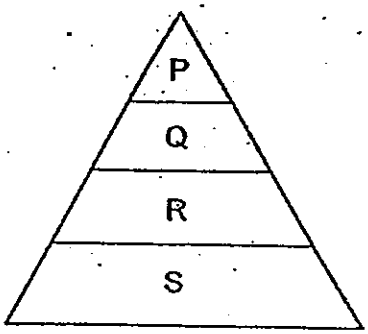
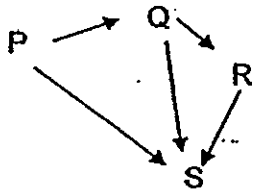
15. The following ecological pyramid shows organisms P, Q, R and S living in the same community.

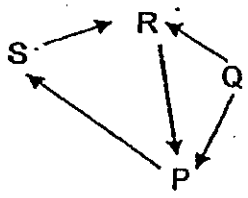


Which one of the following food webs shows the correct relationship, in terms of energy transfer between the organisms?

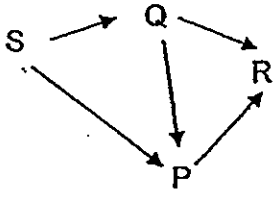
(1)



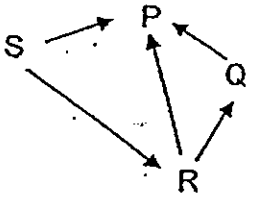
(2)



(3)



(4)



End of Booklet A1

Go on to Booklet A2

METHODIST GIRLS' SCHOOL
Founded in 1887

PRELIMINARY EXAMINATION 2012
PRIMARY 6
SCIENCE

BOOKLET A2

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

INSTRUCTIONS TO CANDIDATES

Do not turn over this page until you are told to do so.
Follow all instructions carefully.
Answer all questions.
Shade your answers in the Optical Answer Sheet (OAS) provided.

Name: _____ ( )

Class: Primary 6._____

Date: 27 August 2012

This booklet consists of 10 printed pages including this page.

Make your choice and shade the oval (1, 2, 3 or 4) on the Optical Answer Sheet.

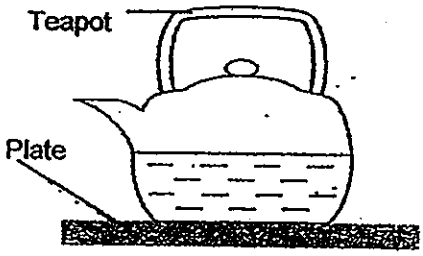
16. The table below shows the freezing points and boiling points of four unknown substances, S, T, U and V.

Substance	Freezing Point (°C)	Boiling Point (°C)
S	20	67
T	0	100
U	80	150
V	67	108

Which of the substances, S, T, U and V, is/are solid(s) at 67°C?

(1) S only
(2) T only
(3) S and V only
(4) U and V only

17. Rim's grandfather loves tea. He notices that his grandfather would brew his tea by putting in some tea leaves and pouring hot water into a teapot. The teapot is then placed on a plate while he takes his time to sip and enjoy his tea.



Which of the following would be the best materials to make the teapot and plate so that the tea was kept the warmest for the longest period of time?

	Teapot	Plate
(1)	Metal	Ceramic
(2)	Glass	Metal
(3)	Ceramic	Glass
(4)	Rubber	Plastic

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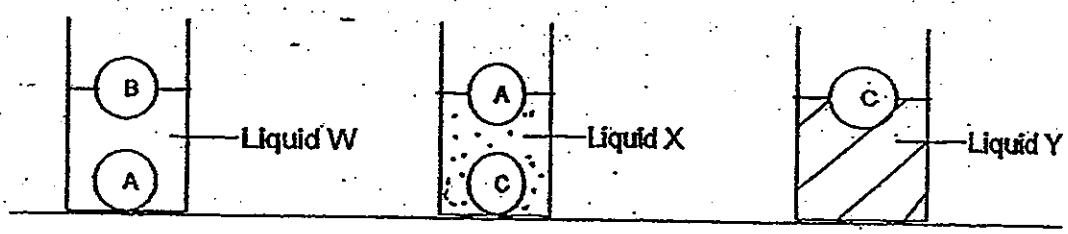
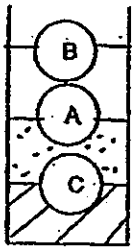
18. Similar balls of different materials A, B and C, were placed in liquids W, X and Y. The balls stayed at the position as shown below.

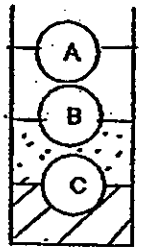


The 3 liquids do not mix together but float on each other. Which one of the following correctly shows the position of the balls?

(1)



(2)



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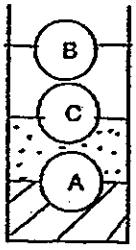

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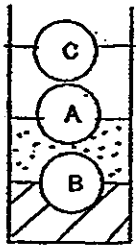

19. The water cycle undergoes a few processes that involve heat gain or heat loss. Which one of the following is true about the water cycle?

	Stages of water cycle	Process	Heat Transfer
(1)	Water ⟶ water vapour	Evaporation	Heat loss
(2)	Water vapour ⟶ cloud	Condensation	Heat loss
(3)	Cloud ⟶ rain	Evaporation	Heat gain
(4)	Cloud ⟶ rain	Condensation	Heat gain

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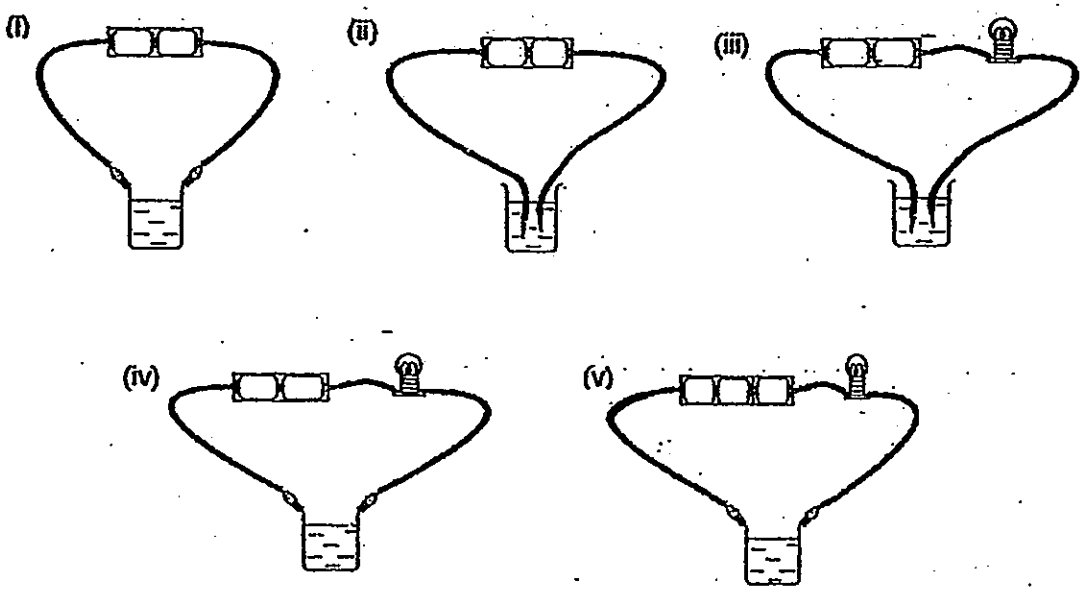
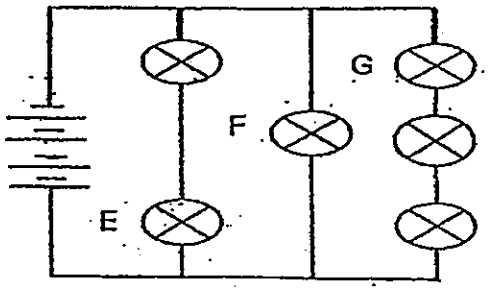
20. Jia Jia wanted to find out whether the container or the liquid in the container is a conductor of electricity. She prepared a few set-ups as shown below.



Which two set-ups are necessary to carry out the experiment?

(1) (i) and (ii)
(2) (ii) and (iii)
(3) (iii) and (iv)
(4) (iv) and (v)

21. A circuit is set up as shown below.



Assuming that none of the bulbs fused, which of the following bulb(s) will be the brightest?

(1) E
(2) F
(3) G
(4) All have equal brightness

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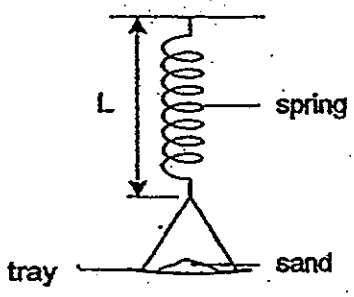
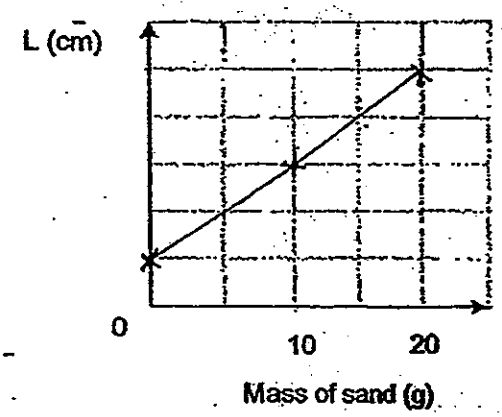
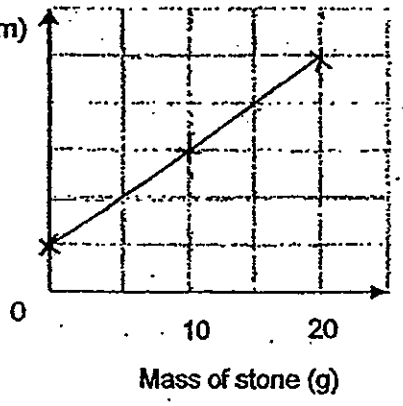
22. Yinghao conducted an experiment to measure the various masses of sand and obtained the results shown in the graph below.



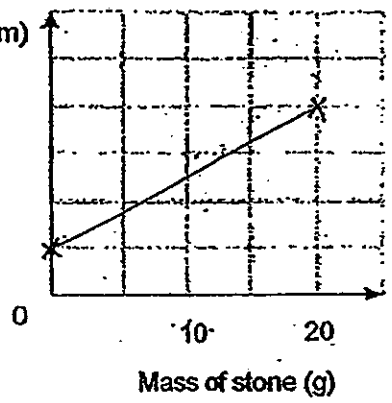


Yinghao repeated the experiment with the same apparatus but replaced the sand with stones. He placed a stone at a time on the tray. Which of the following graphs shows the most likely results obtained?

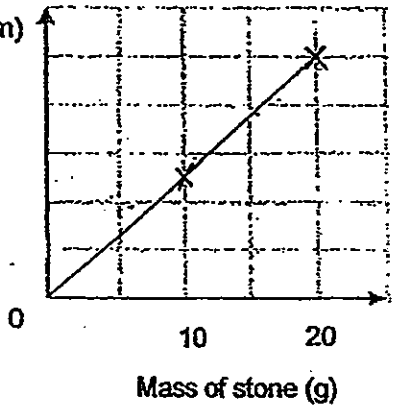
(1)



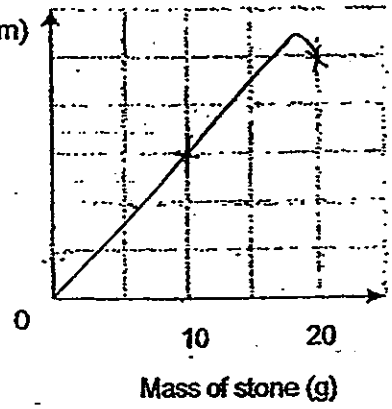
(2)



(3)



(4)



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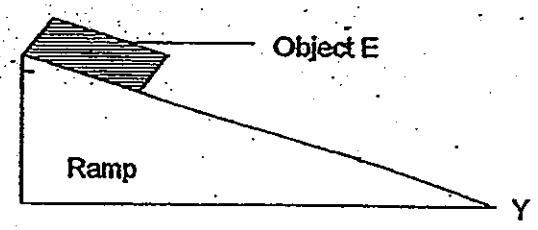
23. An object E was released from the top of the ramp. The time taken for the object to reach Y was recorded.



The experiment was repeated with another 3 objects, F, G and H of different masses. The results obtained are shown in the table below.

Object	Time Taken to reach Y (s)
E	10
F	7
G	15
H	9

Which one of the following statements is true about the objects?

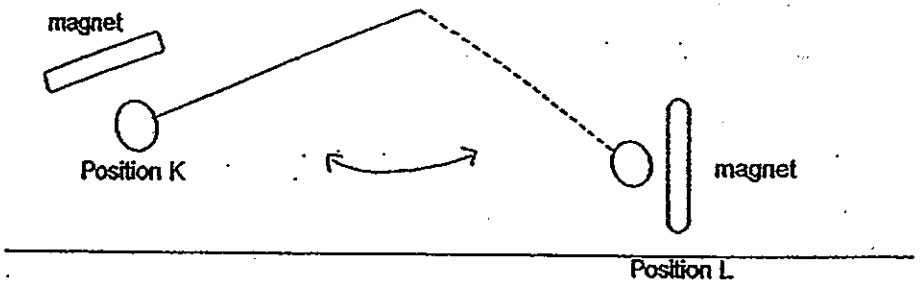
(1) Object F is lighter than object H

(2) Object E is heavier than object G

(3) Object G experienced less friction than object F

(4) Object H experienced more friction than object G

24. A magnetic ball was released at a height and was found swinging back and forth between the positions K and L as shown.



What types of forces were likely acting on the ball at positions K and L that caused the ball to swing back and forth?

	Force(s) at position K	Force(s) at position L
(1)	Repulsion	Repulsion
(2)	Attraction	Repulsion
(3)	Repulsion and gravitational	Repulsion and gravitational
(4)	Attraction and gravitational	Repulsion and gravitational

(Go on to the next page)

25. Which one of the following activities <u>does not</u> cause global warming?

(1) Farmers burning away their old crops
(2) Dumping of factory wastes into the sea
(3) Clearing forest to build new residence areas
(4) High usage of transport vehicles on land and in air

26. Renewable energy is used in the Gardens by the Bay by recycling and burning the rubbish collected. This rubbish will then be converted into useful energy. Some students began to make some statements about this process.

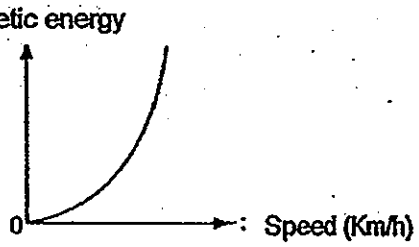
D: Renewable energy reduces global warming
E: Renewable energy is cheaper than using fossil fuel
F: Burning the rubbish can emit poisonous gases if not treated
G: This energy is renewable because it takes a shorter time to produce

Which of the following statements are true about using this renewable energy?

(1) D and E only
(2) E and F only
(3) D, E and F only
(4) All the above statements

(Go on to the next page)

27. The graph below shows the relationship between the speed of a car and the kinetic energy it has.



Based on the graph, what conclusion can you make?

A The car has no kinetic energy when it is at rest.
B The car stops at the maximum amount of kinetic energy.
C The faster the car moves, the more kinetic energy it has.
D The mass of the car does not affect the amount of kinetic energy it has.

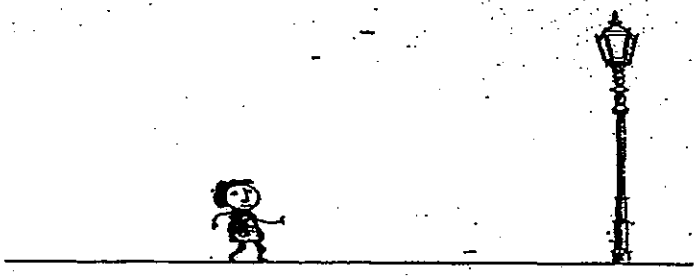
(1) A & C
(2) B & C
(3) C & D
(4) All of the above

28. Many electrical appliances produce heat and light energy but not all are useful. Which of the following options is true about the energy produced by the electrical appliance?

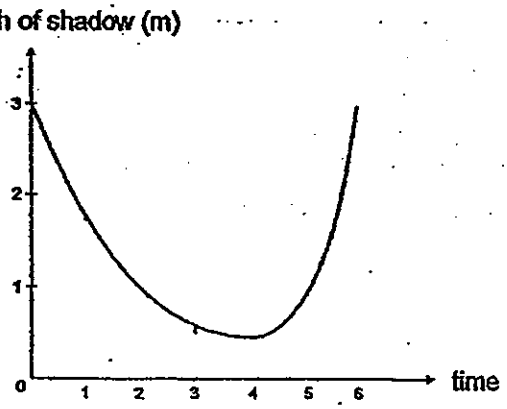
	Electrical appliance	Light energy	Heat energy
(1)	Iron	useful	useful
(2)	Hair dryer	useful	not useful
(3)	Computer	useful	useful
(4)	Television	not useful	not useful

(Go on to the next page)

29. One night, Vamkitat carried out an experiment to find out how the length of her shadow would change as she walked along the street near a street lamp.



She then plotted the graph as shown below.

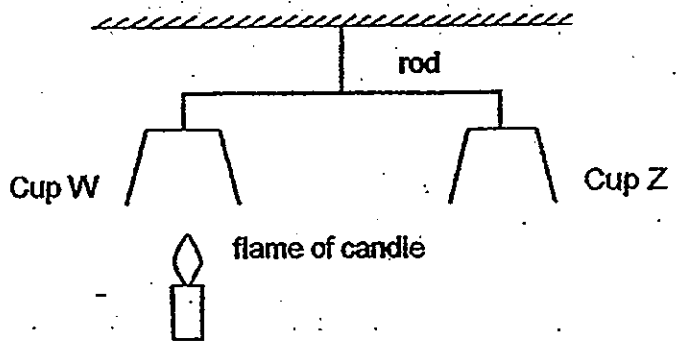


Based on the graph, which one of the following statements is true?
Vamkitat is walking _____.

(1) towards the street lamp
(2) away from the street lamp
(3) away then towards the street lamp
(4) towards then away from the street lamp

(Go on to the next page)

30. Ahmad set up an experiment as shown.



After 5 minutes, he made some observations. What do you think he observed?

(1) Nothing happened to both cups.
(2) Cup W and cup Z moved up and down.
(3) Cup W moved down a little while cup Z moved up.
(4) Cup W moved up a little while cup Z moved down.

End of Booklet A2

METHODIST GIRLS' SCHOOL

Founded in 1887

PRELIMINARY EXAMINATION 2012
PRIMARY 6
SCIENCE

BOOKLET B1

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

INSTRUCTIONS TO CANDIDATES

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

Name: _____ ( )

Class: Primary 6._____

Date: 27 August 2012

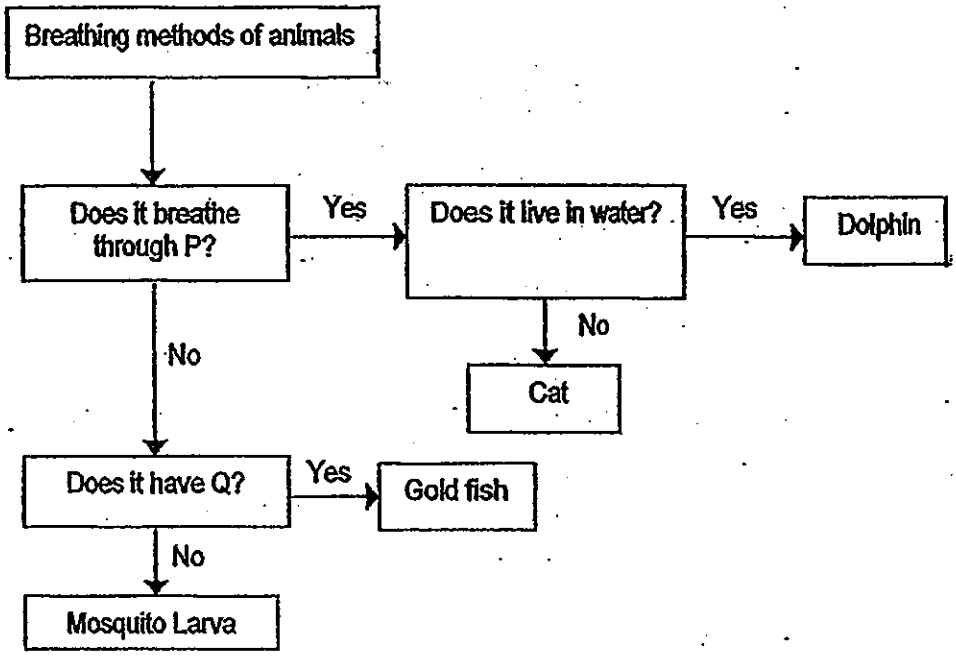
Booklet A	**/ 60**
Booklet B1	**/ 20**
Booklet B2	**/ 20**
TOTAL	**/ 100**

This booklet consists of 8 printed pages including this page.

For questions 31 to 44, write your answers in the space provided.

(40 marks)

31 Study the flowchart below.



(a) What can features P and Q be? (1m)

	P	Q
Features		

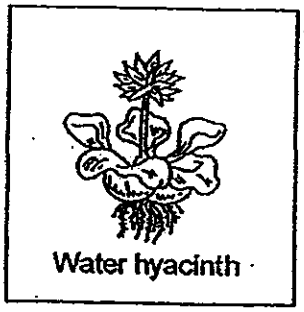
(b) Explain why a dolphin cannot stay underwater for a long period of time. (2m)

_____

_____

32 Hashim wanted to carry out an experiment to find out if affect the submerged plants. He was given the following materials and plants.

- 2 transparent troughs
- Pond water
- Soil
- Some hydrillas and water hyacinths

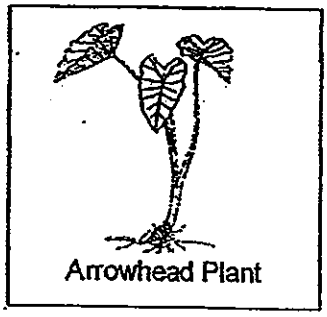

Water hyacinth


Hydrilla

(a) Design an experiment using the above materials to achieve his aim. [2m]

Steps	Description of steps
1	
2	
3	
4	
5	

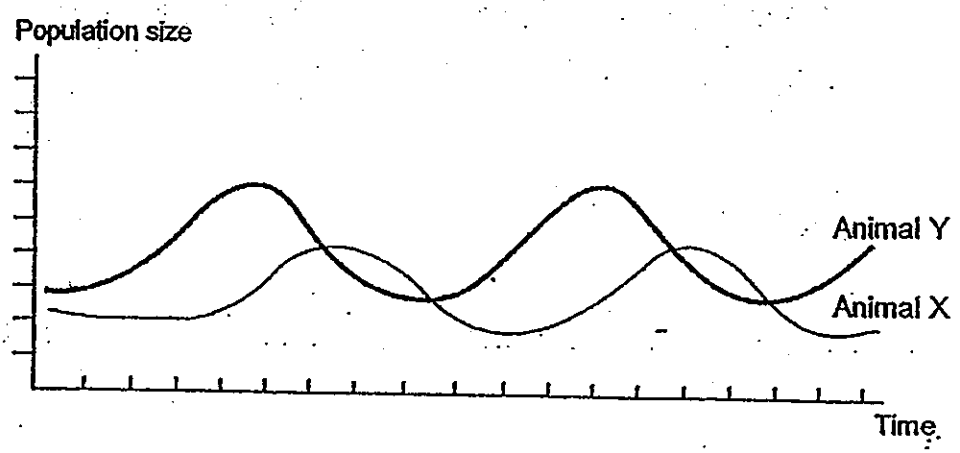
(b) Hashim's friend, Nadia, suggested that he can replace water hyacinths with arrow heads plants using the same experimental procedure. His teacher however disagreed with her suggestion and said that the experiment will not be effective. Explain why. [2m]


Arrowhead Plant

_____

_____

33. The graph below shows the population size of Animal X and Animal Y in the same community.



(a) Fill in the table below with "X" or "Y". (1m)

	Prey	Predator
Animal		

(b) Explain your answer for the animal stated as "Prey" and "Predator" in (a) (1m)

_____

_____

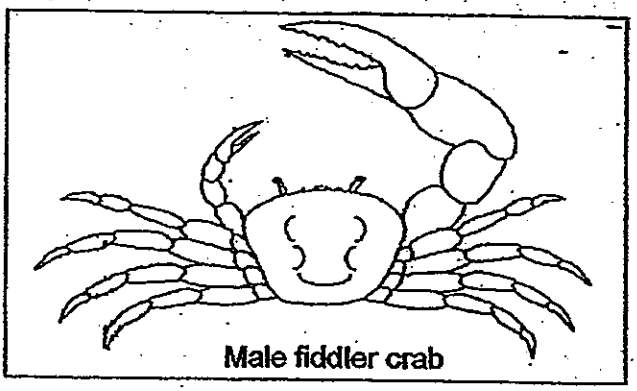
_____

(c) The presence of predator population affects the size of the prey population. State two other factors that would affect the size of prey population. (1m)

_____

_____

34a Wendy went on a learning journey and found many fiddler crabs on the shore. She observed that the female fiddler crabs have a pair of pincers of equal size while the male fiddler crab has one pincer which is larger than the other as shown below



Male fiddler crab

(i) What could be the function of the larger pincer found in the male fiddler crab? (1m)

_____

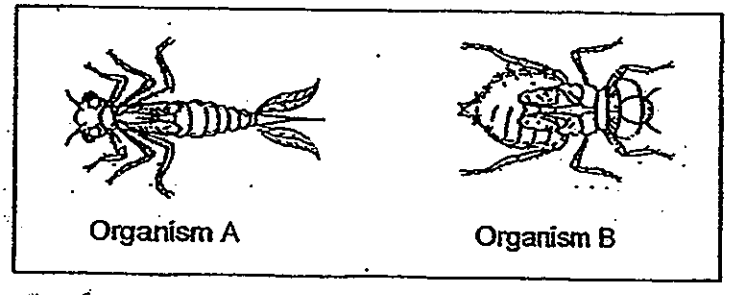
_____

(ii) It is also observed that the fiddler crab has eyes that protrude from the front part of its shell. Why is this adaptation important? (1m)

_____

_____

(b) She returned to school and caught two organisms from her eco-garden pond. These two organisms are shown below.



Organism A Organism B

(i) Which organism will be able to move through water easier? (1/2m)

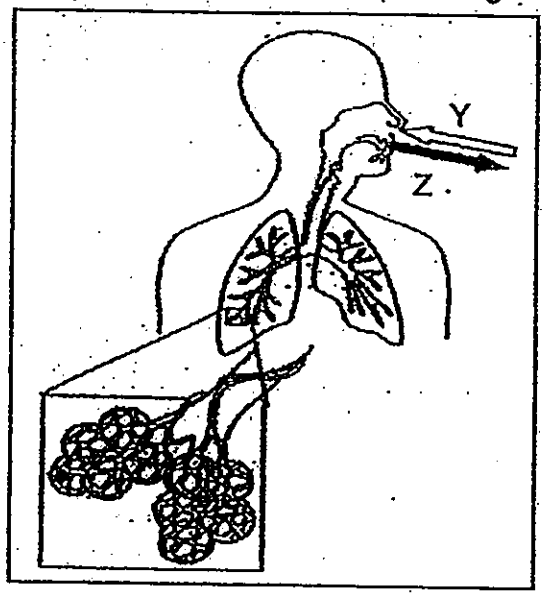
_____

(ii) Explain your answer. (1/2m)

_____

_____

35 The diagram below shows the exchange of gases in the human respiratory system. Arrows Y and Z represent the direction of flow of the gases.



(a) State two differences between the air that flows in the direction of Y compared to Z (2m)

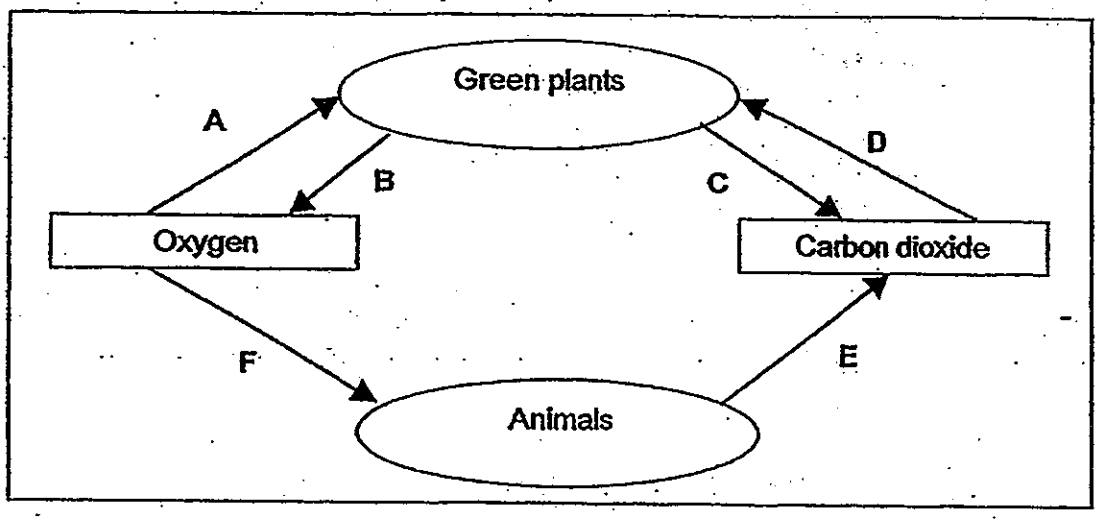
Difference 1	
Difference 2	

(b) The lungs are made up of many air sacs that increase the surface area of the organ. Why do you think a large surface area is necessary? (1m)

_____

_____

36 The arrows in the following diagram show the exchange of gases between living things and their surroundings.



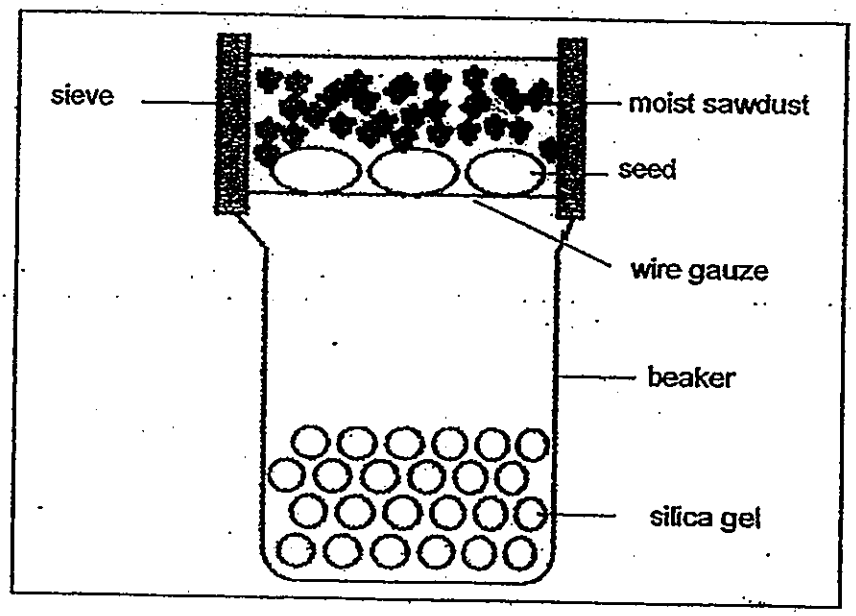
(a) Write the letters of the arrows which show the following processes. (1m)

	Photosynthesis	Respiration	
		Plants	Animals
Arrows			

(b) Name 2 conditions <u>not</u> shown in the diagram that are necessary for photosynthesis. (1m)

_____

37 Janice set up the experiment as shown below. Some green bean seeds were placed on a wire gauze at the base of a sieve. The sieve was then placed on top of a beaker containing a little silica gel which was used to remove moisture in the air. The seeds were then covered with a thick layer of moist sawdust and left in a dark cupboard for a few days.



(a) Janice observed that the green bean seeds germinated after a few days. Give a reason to explain her observation. (1m)

_____

_____

(b) What could be observed about the direction of the growth of the root of the seedling? Explain why. (1m)

_____

_____

Go to Booklet B2

METHODIST GIRLS' SCHOOL

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PRELIMINARY EXAMINATION 2012
PRIMARY 6
SCIENCE

BOOKLET B2

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

INSTRUCTIONS TO CANDIDATES

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

Name: _____ ( )

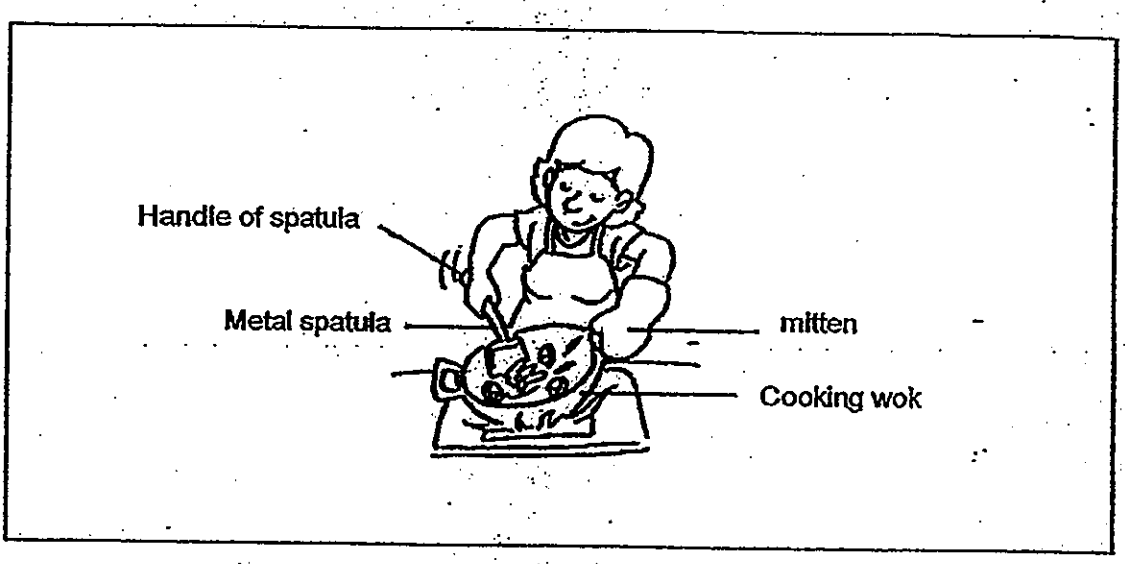
Class: Primary 6._____

Date: 27 August 2012

Booklet B2	/ 20

This booklet consists of 8 printed pages including this page.

38. **Mrs Sitoe usually cooks dinner for her family. There are four kitchen items/parts shown in the picture below.**

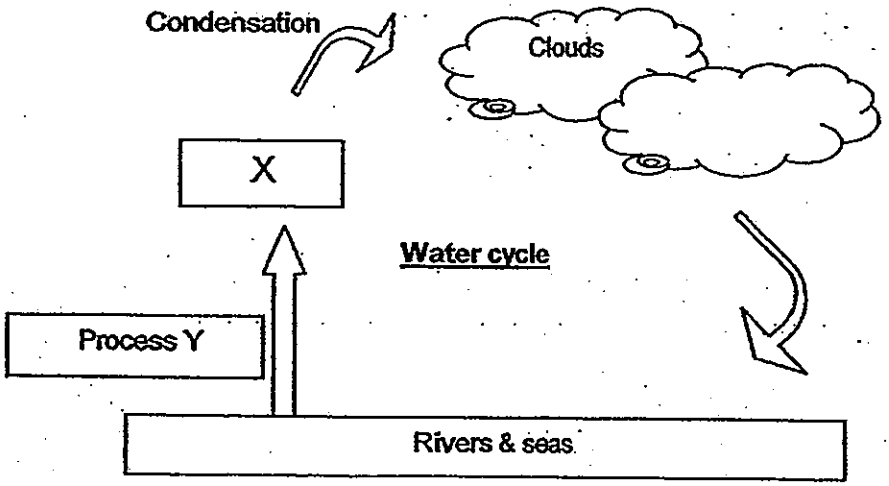


Classify the above four kitchen items/parts in the chart below. (2 m)

Kitchen items/parts	
Good conductor of heat	Poor conductor of heat

Study the water cycle below and answer questions 39 and 40.

39. Fill in the blanks with the correct answers.

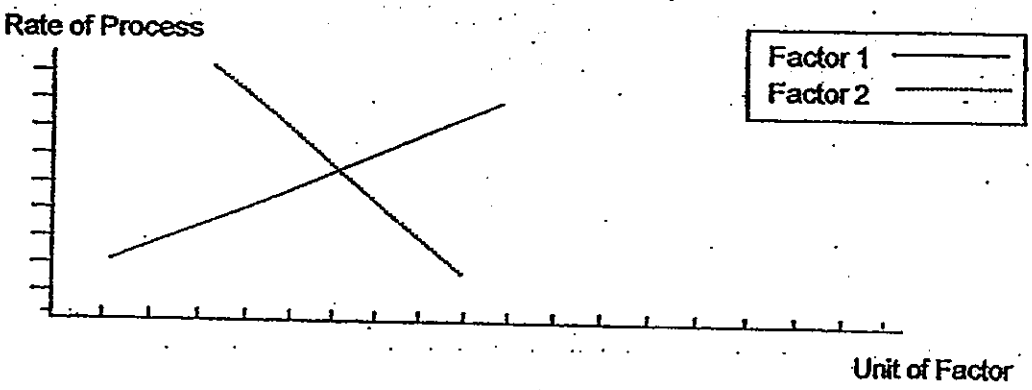


(a) Name Process Y?_____ (1 m)

(b) What is X?_____ (1 m)

(c) What is the state of X?_____ (1 m)

40. The graph below shows the relationships between the process mentioned in 39(a) and two factors that affect its rate.

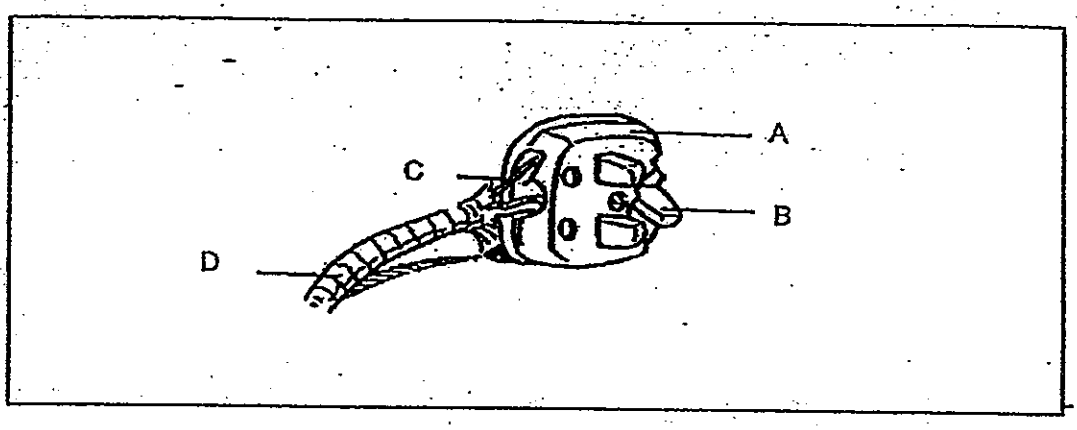


Name the two possible factors. (2 m)

Factor 1: _____

Factor 2: _____

41. The diagram shows a plug and some electrical wires.



(a) Write the letter 'A', 'B', 'C' and 'D' in the correct boxes below. (2 m)

Conductor of electricity	Insulator of electricity

(b) At night, Sam will switch on the lights in his room. He realizes that both lamps in his room light up at the same time. His father told him the lamps are actually connected in parallel arrangement. What is a disadvantage of such an arrangement? (1 m)

Disadvantage: _____

_____

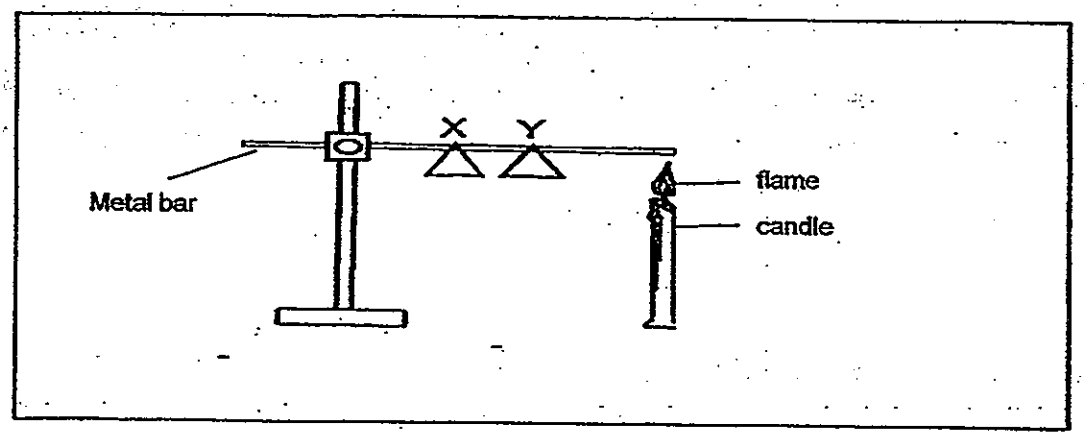
_____

42. The development in science and technology has brought about some negative impacts on the environment, such as, global warming and air pollution.

(a) How does deforestation lead to global warming? (1 m)

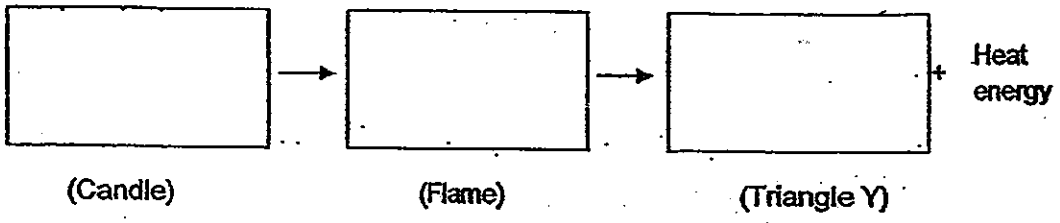
(b) How does air pollution cause acid rain? Name one effect of acid rain. (1 m)

43. Sunesh attached two identical triangles X and Y on a metal bar with wax. When the bar was heated at one end for five minutes, triangle Y dropped first followed by triangle X.

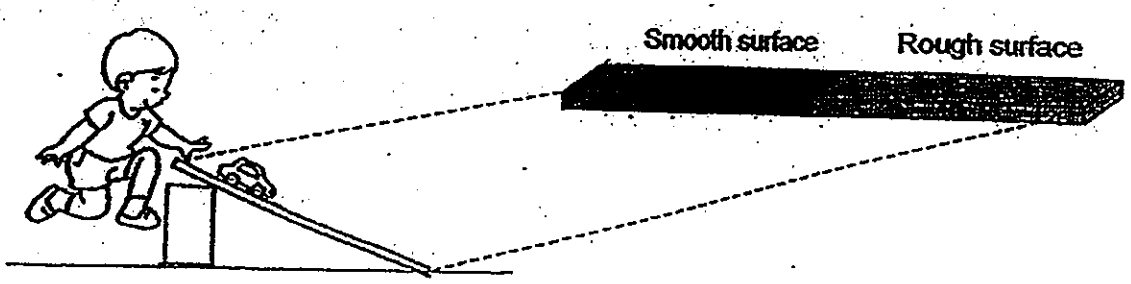


(a) Explain why the triangles dropped at different times. (2 m)

(b) Complete the energy conversion of the above activity by filling in the appropriate energy in the boxes given. (2 m)



44. Aru released a toy car from the top of a ramp which was made of two different surfaces as shown below.



(a) What would Aru observe when he releases the toy car? (1 m)

_____

_____

(b) In a multi-storey car park, the surface of the slope is rougher than the level surface where the cars are being parked. Explain why. (2 m)

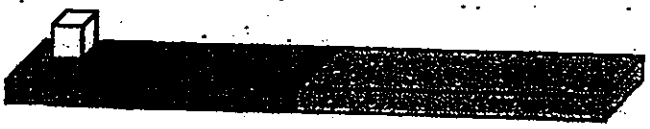
_____

_____

_____

_____

(c) The same ramp in (a) is then placed on a table. A box is placed on the ramp at the smooth end as shown.



Name the force(s) that act(s) on the box when it is pushed forward on the ramp's surface. (1 m)

_____

End of Booklet B2

Answer Ke

EXAM PAPER 2012

SCHOOL : MGS
SUBJECT : PRIMARY 6 SCIENCE

TERM : SA2

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17
1	3	1	2	2	3	2	3	3	1	1	1	1	2	4	4	3

Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
1	2	3	2	1	2	3	2	4	1	1	4	4

31)a)P: Lungs Q: Gills
b)A dolphin has lungs and does not take in dissolved oxygen, therefore, the dolphin has to come out to the surface of the water for oxygen.

32)a)1)Fill both troughs with an equal amount of pond water.
2)Add an equal amount soil to the bottom of both troughs.
3)Add some hydrillas to both troughs.
4)Add a few water hyacinth to one of the troughs.
5)See if the hydrillas in any of the troughs die.
b)The leaves of the arrowhead plants are located above the water surface and sunlight can still reach the bottom of the trough, making the experiment ineffective.

33)a)Y, X
b)When the number of Y decreases X, decreases X relies on Y for food and the number of predators win always be lower than the preys.
c)The amount of producers, and presence of other population.

34)a)i)To fight with other male fiddler crab for mate or food.
ii)The eyes stalks can stick out to enable the crab to see the complete view of its surrounding.

34)b)i)Organism.
ii)It has a more streamline body than B.

35)a)1)Y contains more oxygen than Z.
2)Z contains more water vapour than Y.
b)A large surface area enables exchange to take place more efficiently. More oxygen can be absorbed into the blood stream and more carbon dioxide can be released out of the body faster.

36)a)D,B A,C F,E
b)Sunlight and water.

37)a)There was warth, water from the moist sawdust and air from the surroundings.
b)The root will grow towards the moist saw dust in order to absorb water.

38)<u>Good conductor of heat</u> <u>Poor conductor of heat</u>
Metal spatula cooking wok Handle of spatula mitten

39)a)Evaporation b)Water vapour c)Gas

40)1)Exposed surface area. 2)humidtity

41)a)C,B D,A
b)Use more electricity than the series arrangement.

42)a)Without trees, there would be too much carbon dioxide the air that traps heat leading to global warming.
b)The poisoness gases in the air dissolves in the rain, resulting in acid rain which will erode buildings and external structures.

43)a)The heat of the flame was conducted to the metal bar and it melted the wax nearest to the flame causing triangle Y to drop and then followed by X.
b)Chemical Potential Energy→Heat Energy→Kinetic Energy

44)a)The toy car would move fast on the smooth surface and will slow down on the rough surface.
b)A rougher surface has more friction than the smoother surface thus, it slows down the car when it travels down the slope.
c)Frictional and pushing force.