



## **2021 PRIMARY 6 MID-YEAR EXAMINATION**

Name : \_\_\_\_\_ (    )

Date: 11 May 2021

Class : Primary 6 (    )

Time: 9.30 a.m. - 11.15 a.m.

Duration: 1 hour 45 minutes

Parents's Signature: \_\_\_\_\_

## **SCIENCE BOOKLET A**

### **INSTRUCTIONS TO CANDIDATES**

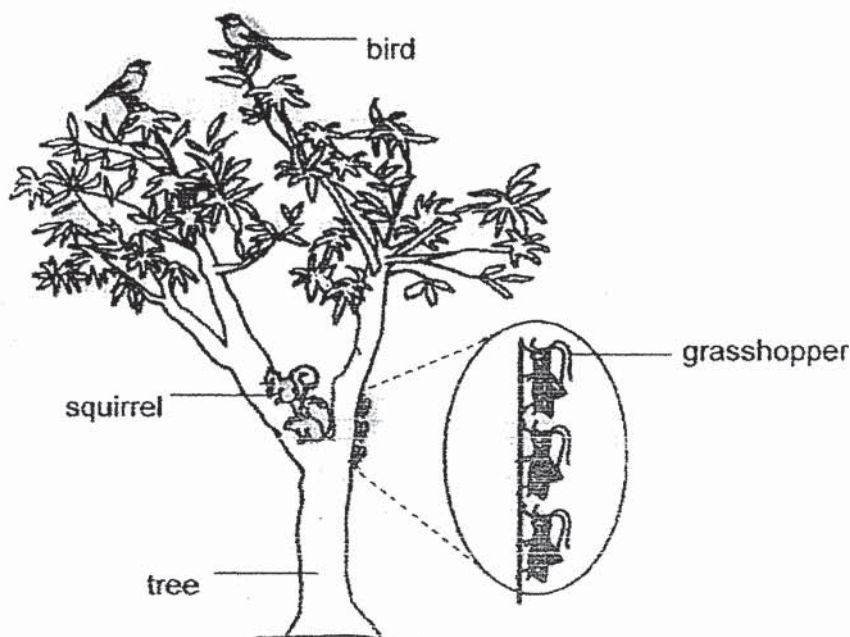
1. Write your name, class and register number.
2. Do not turn over this page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Shade your answers on the Optical Answer Sheet (OAS) provided.

**Booklet A (28 x 2 marks)**

For each question from 1 to 28, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and shade your answer on the Optical Answer Sheet.

(56 marks)

1. The diagram below shows a tree habitat.

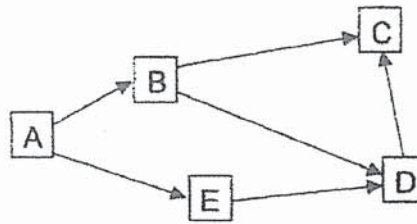


Which of the following shows the correct number of communities and number of populations in this tree habitat?

	Number of communities	Number of populations
(1)	1	3
(2)	1	4
(3)	3	3
(4)	4	4

2. Which of the following statements is true about the food made during photosynthesis?
- Excess food can only be stored in the roots.
  - Excess food made through photosynthesis is stored as starch.
  - Food is absorbed from the soil when the plant carries out photosynthesis.
  - Food made in the leaves is only transported to all parts of the plant above the roots.

Study the food web below and answer Questions 3 and 4.



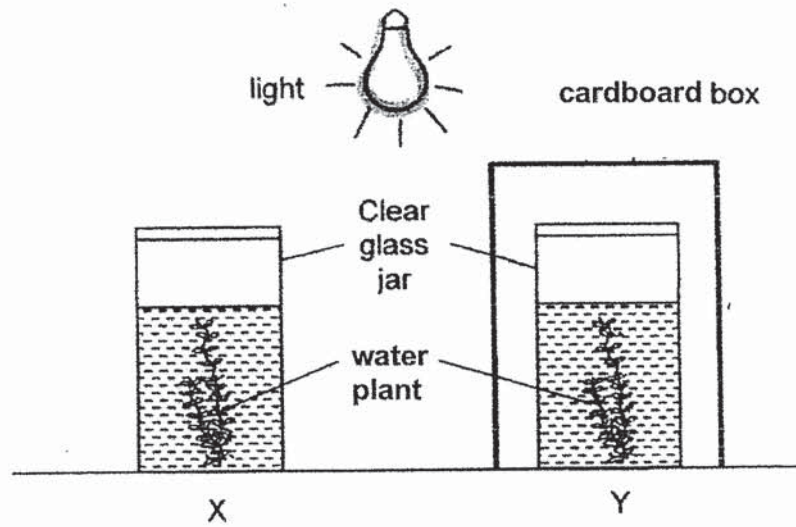
3. Which one of the following is correct?

	Prey only	Predator only	Prey and Predator	Food Producer
(1)	C	B and E	D	A
(2)	B and D	A	E	C
(3)	B and E	C	D	A
(4)	B	C	D and E	A

4. Which of the following can be concluded from the above food web?

- (1) B and D are plant-eaters.
- (2) C is the only animal-eater.
- (3) A is the only food producer.
- (4) D is a plant-and-animal-eater.

Gina carried out an experiment as shown below.

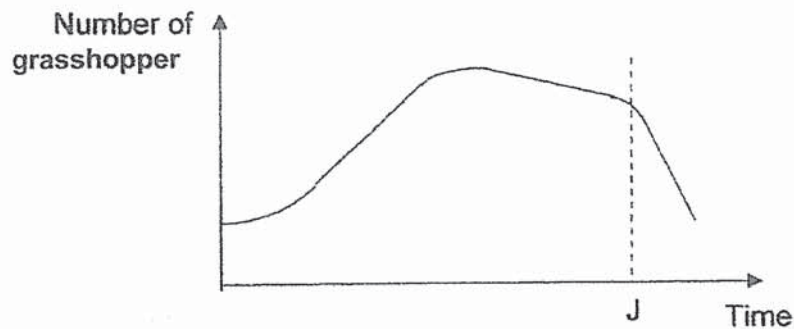


How will the amount of oxygen in the water change after a few hours?

Amount of oxygen		
	X	Y
(1)	increase	no change
(2)	increase	decrease
(3)	decrease	increase
(4)	no change	increase

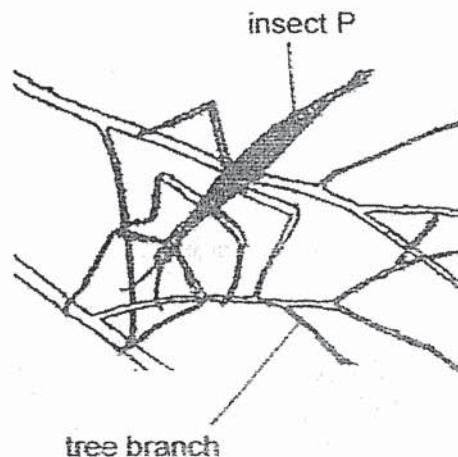


6. The graph below shows the number of grasshoppers in a field community.



What could have happened after point J that had caused the change in the number of grasshoppers?

- (1) Fertilizer was added to the soil.
  - (2) More grass was planted in the field.
  - (3) Grasshoppers reproduce more quickly.
  - (4) More predators of grasshoppers were released into the field.
7. The diagram below shows insect P on a tree branch.

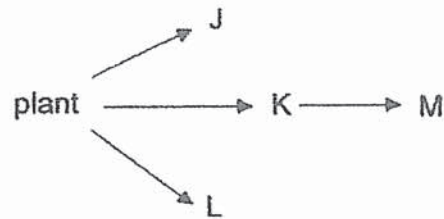


Insect P feeds only on the leaves of tree branches. They are often eaten by birds and reptiles but do not hide from its predators. How does keeping very still on a branch help insect P in its survival?

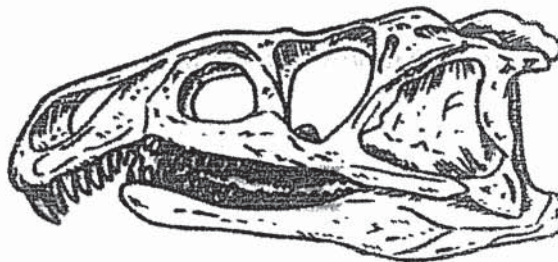
- (1) It helps the insect to find food.
- (2) It helps the insect to attract mates.
- (3) It prevents the insect from falling off a tree branch.
- (4) It prevents the insect from being detected by its predators.

8. Which of the following is an example of behavioural adaptation?
- (1) Wolves hunt together in packs.
  - (2) Moles have claws to dig the soil.
  - (3) Jellyfish have venom to sting its prey.
  - (4) Ducks have webbed feet to paddle in the water.
9. A population of W was introduced into a habitat. As a result, the population of X increased while the population of Y decreased. Which of the following food chains shows the correct food relationship between the organisms?
- (1) Plant  $\rightarrow$  X  $\rightarrow$  Y  $\rightarrow$  W
  - (2) Plant  $\rightarrow$  X  $\rightarrow$  W  $\rightarrow$  Y
  - (3) Plant  $\rightarrow$  W  $\rightarrow$  Y  $\rightarrow$  X
  - (4) Plant  $\rightarrow$  Y  $\rightarrow$  X  $\rightarrow$  W

10. The food web below shows the relationship between organisms J, K, L and M in a community.



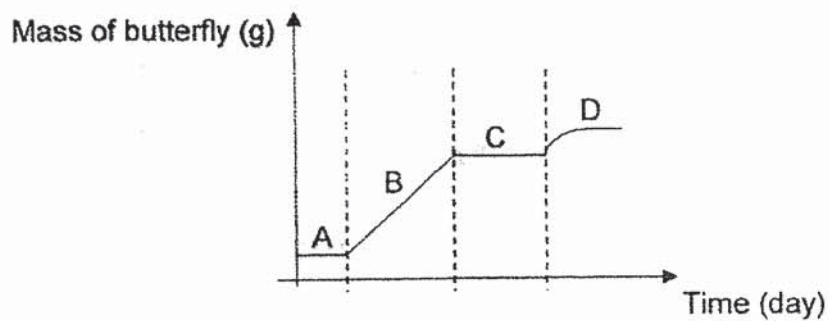
The jawbone of one of the organisms is shown below.



Which organism in the food web above is likely to have such a jawbone?

- (1) J
- (2) K
- (3) L
- (4) M

11. The graph below shows the mass of a butterfly during different stages of its life cycle.



Which of the following best represents the butterfly at its pupal stage?

- (1) A
  - (2) B
  - (3) C
  - (4) D
12. Diagrams 1 and 2 below show the reproductive systems of a flower and a female human respectively.

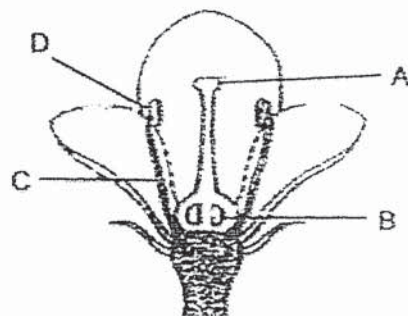


Diagram 1

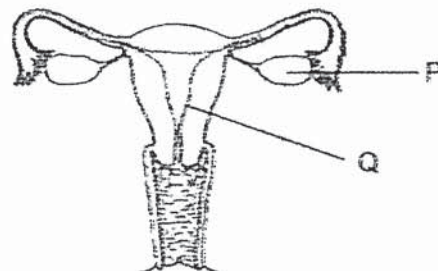


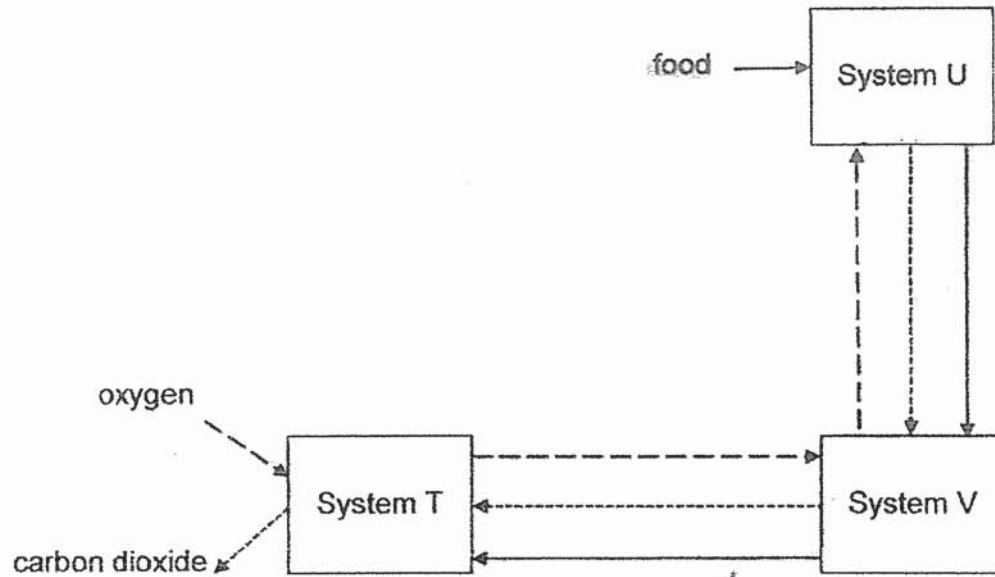
Diagram 2

Which two reproductive parts have a similar function?

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



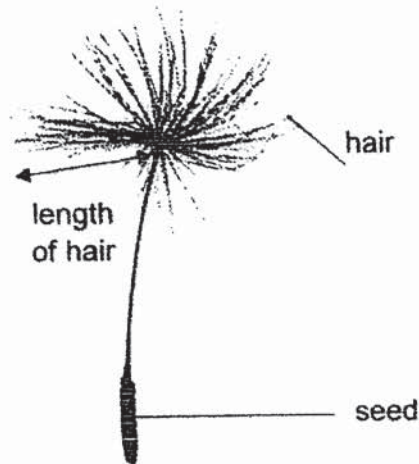
13. The diagram below shows how some of the systems in the human body work together.



Which of the following systems are correctly identified?

	<b>System T</b>	<b>System U</b>	<b>System V</b>
(1)	digestive	respiratory	circulatory
(2)	respiratory	circulatory	digestive
(3)	circulatory	digestive	respiratory
(4)	respiratory	digestive	circulatory

14. The diagram below shows a seed of a plant.



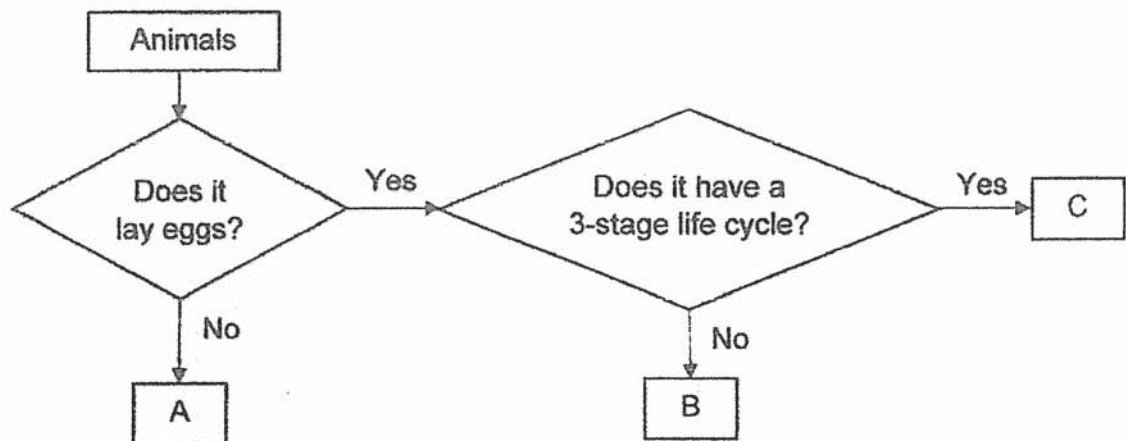
Siti investigated how the length of hairs of a seed affects the time taken for the seed to reach the ground. The experiment was conducted in a room and the seeds were dropped from the same height. The results were shown below.

Seed	Average length of hairs (cm)	Time taken for the seed to reach the ground (s)
A	1.5	4.8
B	1.0	4.0
C	0.5	2.6

What can be concluded from the results above?

- (1) The seeds are dispersed by water.
- (2) Seed B took a longer time to reach the ground than seed A.
- (3) The seeds can be dispersed further if the average length of hair is decreased.
- (4) As the average length of hairs increases, the time taken for the seed to reach the ground increases.

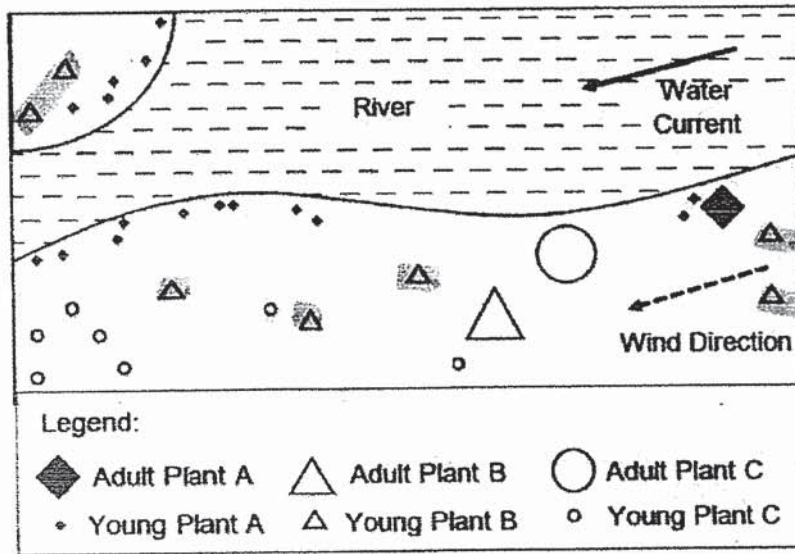
15. Study the flow chart below.



Based on the information above, which of the following correctly represents animals A, B and C?

	A	B	C
(1)	tiger	butterfly	grasshopper
(2)	tiger	grasshopper	butterfly
(3)	eagle	butterfly	grasshopper
(4)	eagle	grasshopper	butterfly

16. The map below shows the location of the adult plants, A, B and C, and the distribution of their young plants.

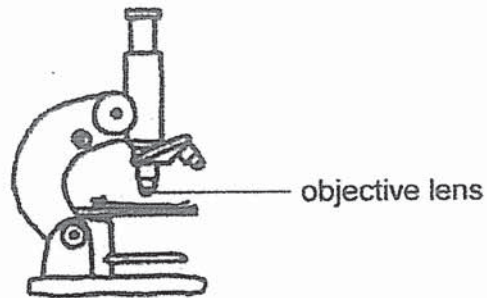


Which of the following shows the correct methods of seed dispersal for plants A, B and C?

	By Water	By Animal	By Wind
(1)	Adult Plant A	Adult Plant B	Adult Plant C
(2)	Adult Plant B	Adult Plant C	Adult Plant A
(3)	Adult Plant B	Adult Plant A	Adult Plant C
(4)	Adult Plant A	Adult Plant C	Adult Plant B



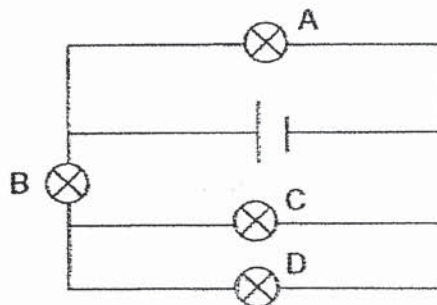
17. A microscope is used to view cell specimens.



Which of the following materials is most suitable to make the objective lens that allows the specimens to be seen most clearly?

	Material	Amount of light that passes through the material (units)
(1)	E	0
(2)	F	500
(3)	G	2000
(4)	H	4500

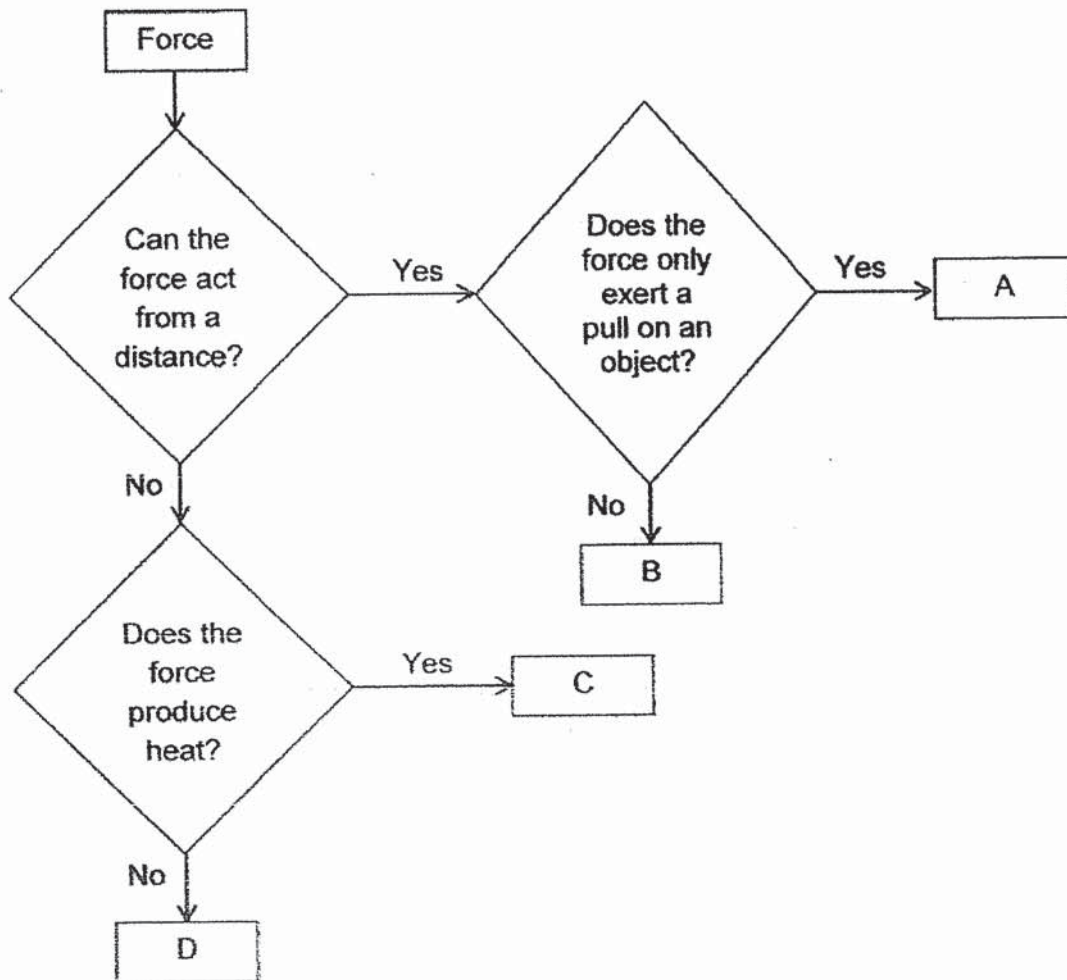
18. Study the circuit diagram below.



Which of the bulbs, if fused, would allow only one bulb to light up?

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

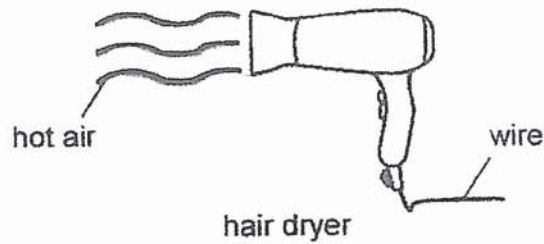
Study the flow chart below and answer Questions 19 and 20.



19. Which of the forces, A, B, C or D, best represents frictional force?

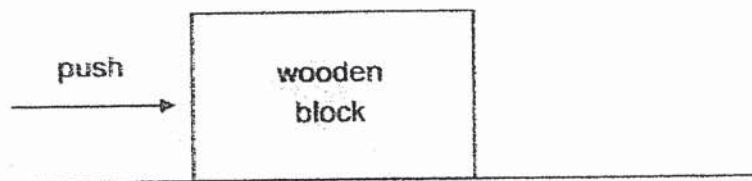
- (1) A
- (2) B
- (3) C
- (4) D

22. The diagram below shows a hair dryer that is switched on with hot air blowing out.



Which of the following best shows the type(s) of energy that is present when the hair dryer is switched on?

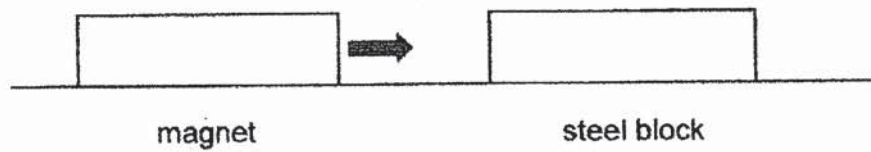
- (1) Heat energy only
  - (2) Heat energy and sound energy only
  - (3) Kinetic energy and sound energy only
  - (4) Heat energy, kinetic energy and sound energy
23. A push was applied to move a wooden block as shown below.



Which of the following correctly shows the directions of gravity and friction exerted on the wooden block when it is pushed?

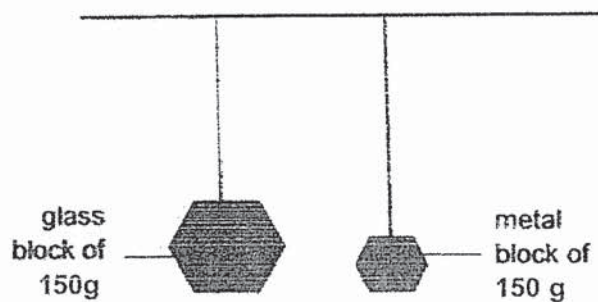
	Gravity	Friction
(1)	→	→
(2)	↓	↑
(3)	↓	←
(4)	←	↓

24. The diagram below shows a magnet brought near a steel block.



What will happen to the steel block?

- (1) It will move up.
  - (2) It will not move.
  - (3) It will move towards the magnet.
  - (4) It will move away from the magnet.
25. The diagram below shows two blocks being hung at the same height from the ground.

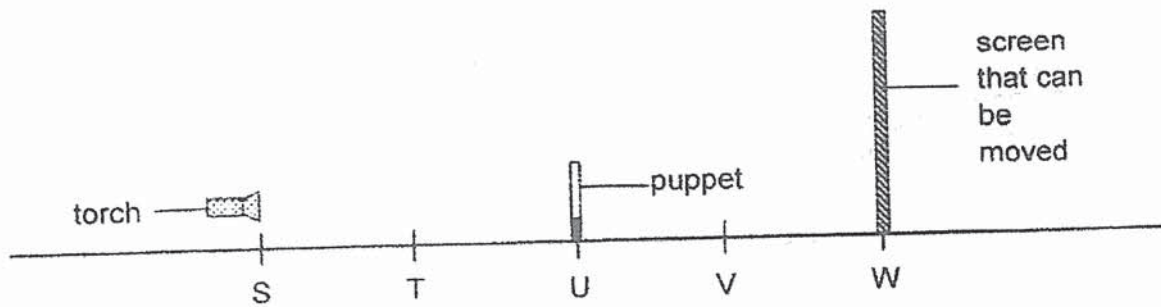


Which of the following correctly shows the energy possessed by both blocks and its amount in comparison with the other block?

	Type of energy in both blocks	Amount of energy of the glass block when compared to the metal block
(1)	potential	more
(2)	potential	same
(3)	kinetic	more
(4)	kinetic	less



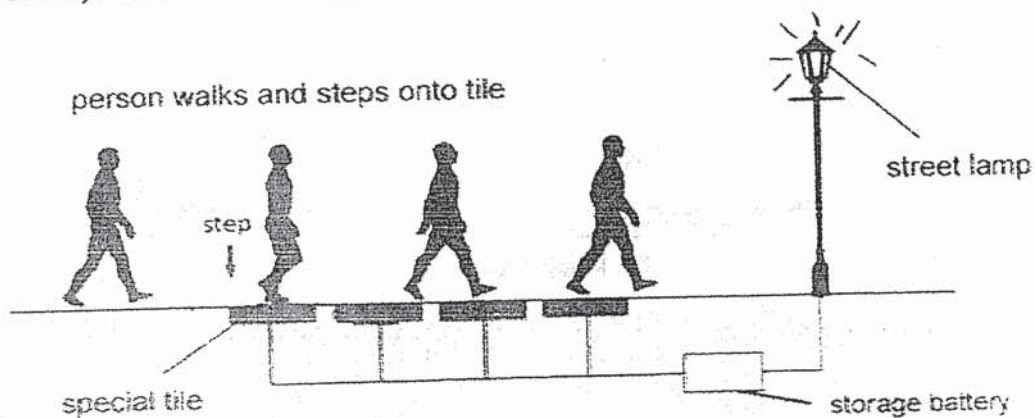
26. Jack creates a shadow using the set-up as shown below.



Which positions, S, T, U, V and W, should Jack place the torch, puppet and screen at to create the biggest shadow?

	torch	puppet	screen
(1)	S	T	U
(2)	S	T	W
(3)	T	V	W
(4)	U	V	W

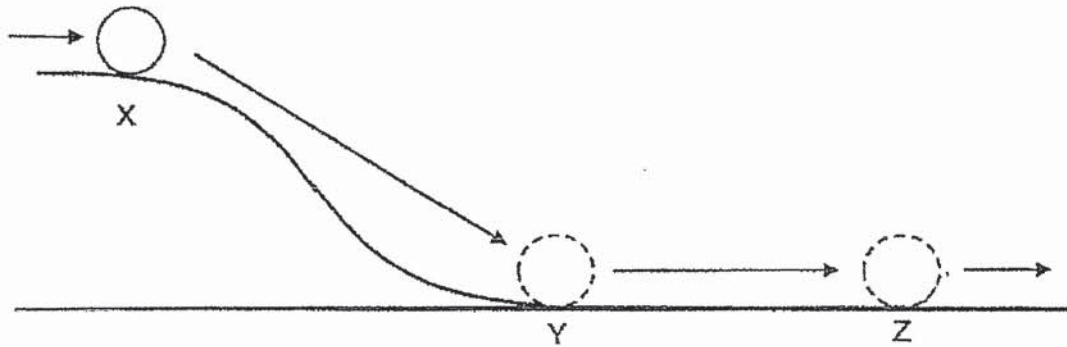
27. The diagram below shows a man walking along a path lined with special tiles. When the man steps on these tiles, electricity is generated and stored in a battery. This stored energy is used to light up street lamps at night.



Which of the following best shows the correct conversion of energy?

- (1) kinetic energy  $\rightarrow$  light energy
- (2) kinetic energy  $\rightarrow$  potential energy  $\rightarrow$  light energy
- (3) potential energy  $\rightarrow$  electrical energy  $\rightarrow$  kinetic energy  $\rightarrow$  light energy + heat energy
- (4) kinetic energy  $\rightarrow$  electrical energy  $\rightarrow$  potential energy  $\rightarrow$  electrical energy  $\rightarrow$  light energy

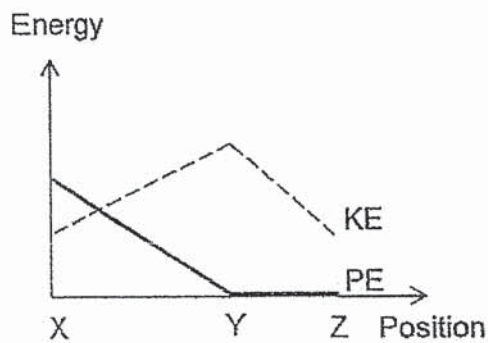
28. The diagram below shows a ball moving along the top of a hill towards X and then it rolled down from X to Y then to Z. The ball continued moving after Z.



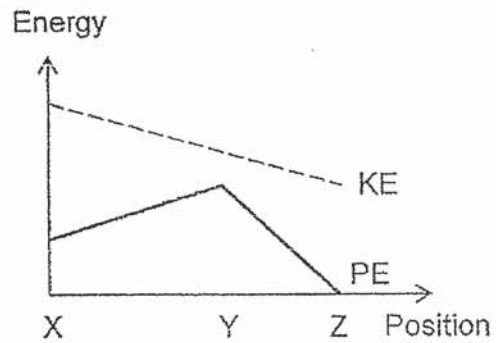
Which of the following graphs best represents the energy changes of the ball from position X to Z?

Key	
-----	KE: Kinetic Energy
————	PE: Potential Energy

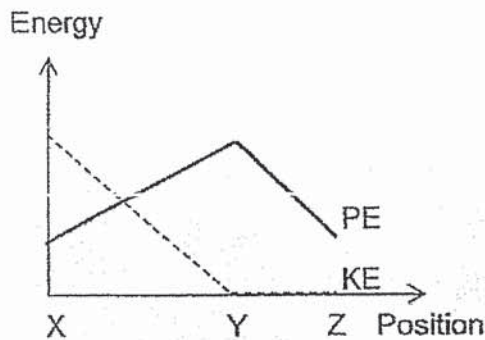
(1)



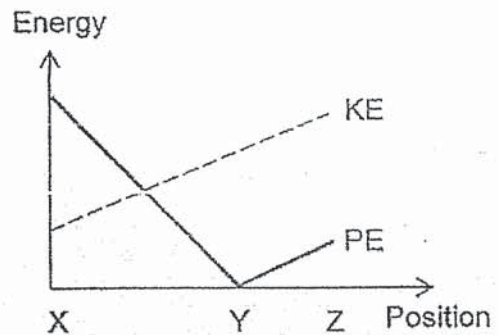
(2)



(3)



(4)





## 2021 PRIMARY 6 MID-YEAR EXAMINATION

Name : \_\_\_\_\_ (   )

Date: 11 May 2021

Class : Primary 6 (   )

Time: 9.30 a.m. – 11.15 a.m.

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

Duration: 1 hour 45 minutes

# SCIENCE

## BOOKLET B

### INSTRUCTIONS TO CANDIDATES

1. Write your name, class and register number.
2. Do not turn over this page until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Write your answers in the booklet.

Booklet A	56
Booklet B	44
Total	100



**Booklet B**

For questions 29 to 40, write your answers clearly in this booklet.

The number of marks available is shown in brackets [ ] at the end of each question or part question.

(44 marks)

29. The diagrams below show different parts of a plant.



Diagram 1

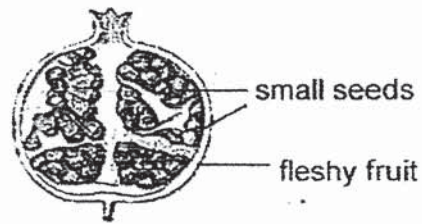


Diagram 2

- (a) Based on Diagram 1, explain how pollination can be carried out for this plant. [1]

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- (b) Based on Diagram 2, describe how the seeds of the plant above can be dispersed over a wide area. [1]

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- (c) How does being further away from the parent plant help the young plants to grow better? [1]

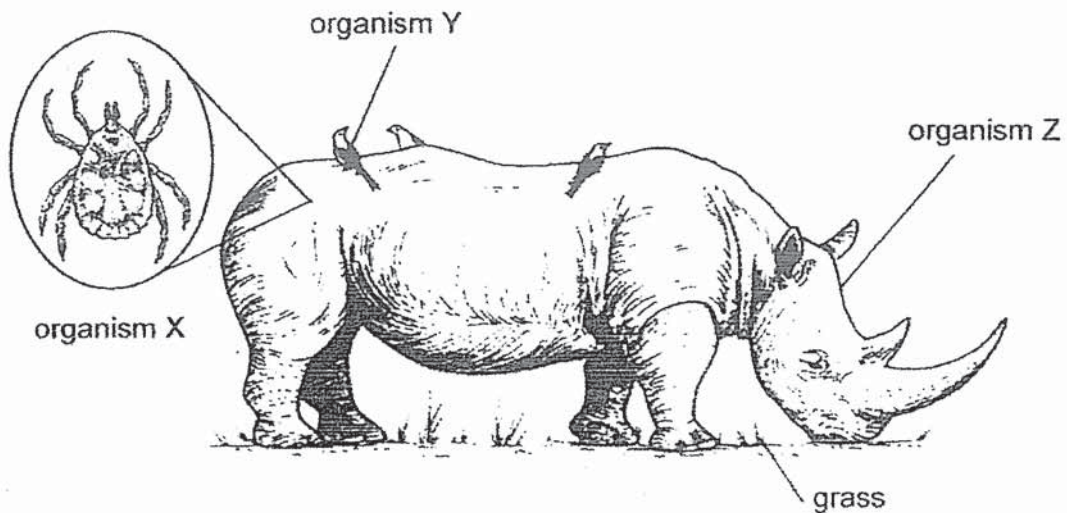
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30. Organism X feeds on the blood of animals and can spread diseases. Organism Y feeds on organism X. Organism Y is often found riding on the back of organism Z.



- (a) Based on the information above, how does organism Z benefit from its interaction with organism Y? [1]

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- (b) How does organism Y benefit from its interaction with organism Z? [1]

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- (c) Is organism X an insect? Explain your answer. [1]

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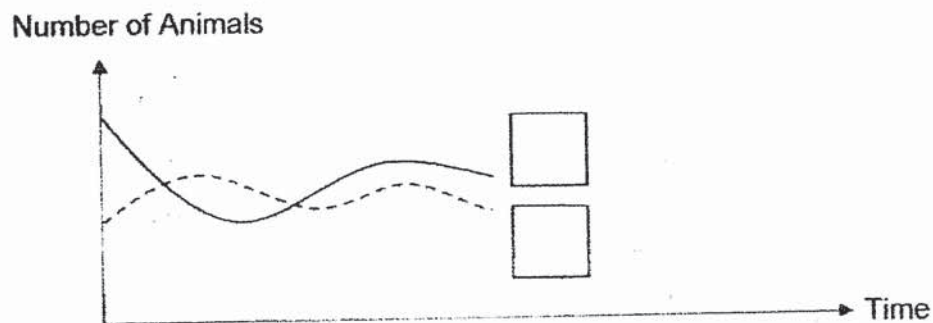


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31. Study the food chain of a habitat shown below.

Plant  $\longrightarrow$  Organism J  $\longrightarrow$  Organism K

The population of organism J contracted a disease which affected its numbers. The graph below showed how the population of organisms J and K changed over a period of time.



(a) Fill in the appropriate boxes above with the letters 'J' and 'K'. [1]

(b) How would the population of organism K change when the number of plants in the habitat decreases. Explain why. [2]

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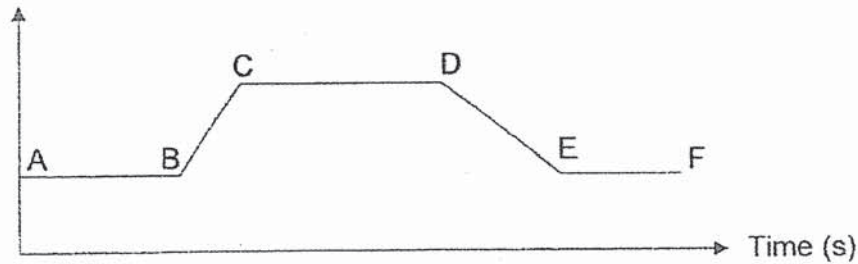
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32. Justin drank an energy drink before his swimming competition. The graph below shows his heart rate when he was at the pool.

Heartbeats per minute

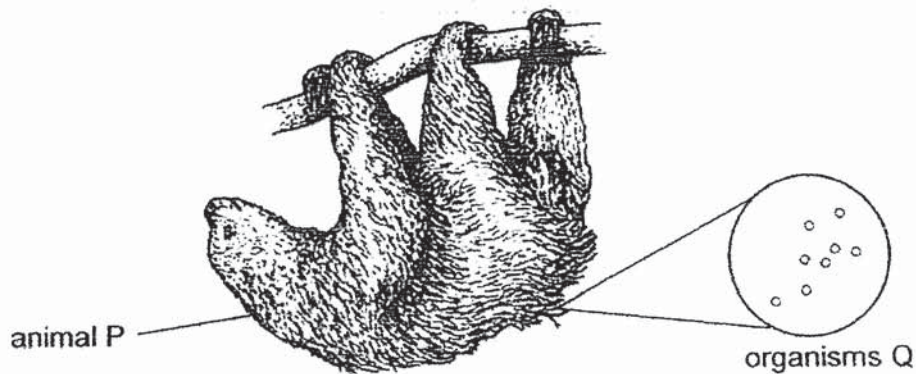


- (a) Based on the graph, fill in the blanks below with A, B, C, D, E or F.
- (i) Justin started swimming at \_\_\_\_\_ [1/2]
- (ii) Justin stopped swimming at \_\_\_\_\_ [1/2]
- (b) Explain why Justin's heart rate was higher when he swam faster? [2]
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- (c) Which of the following body systems worked together to enable him to lift his head above the water surface during swimming? Put a tick (✓) in the correct boxes. [1]

System	Used to lift his head
Skeletal	
Muscular	
Digestive	
Circulatory	
Respiratory	



33. The diagram below shows Animal P on a tree.



Animal P is a plant-eater which has long limbs and sharp claws. It moves slowly and its fur is often green due to organisms Q growing on it. Once a week, animal P will climb down and pass out its droppings at the bottom of the tree. It also has a flexible neck and spine and can rotate its head almost all the way around.

- (a) How does having organism Q growing on the fur benefit animal P in its survival? [1]

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- (b) Explain one way how the trees benefit from animal P living on them. [1]

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- (c) Animal P cannot move fast enough to run away from its predators. Besides the benefit mentioned in (a), from the information given, explain how the two other adaptations help animal P in its defence. [2]

Adaptation 1: \_\_\_\_\_

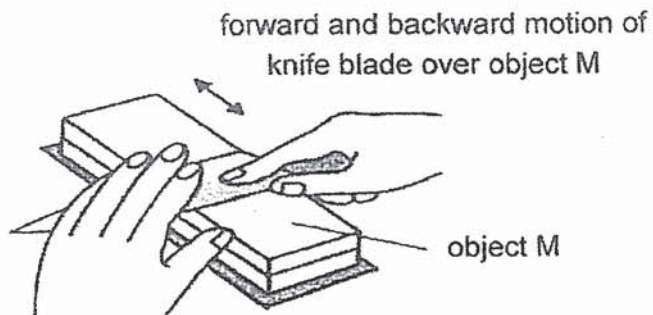
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Adaptation 2: \_\_\_\_\_

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34. Melissa used object M to sharpen her knife as shown below.



- (a) Identify the force that sharpened the knife. [1]

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- (b) The knife blade felt warm after it was moved over object M several times. Give a reason for this observation. [1]

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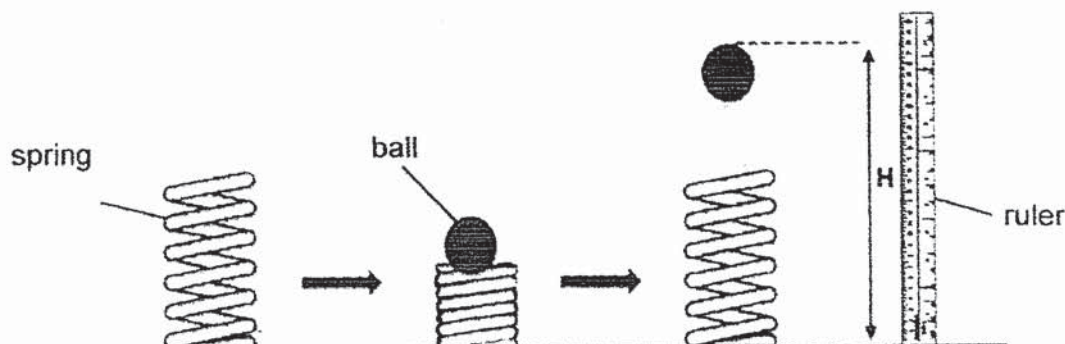


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- (c) The knife blade is made of an inflexible material. Suggest another property that the material must have in order to cut an apple. Give a reason for your answer. [1]

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5. Farah wanted to find out the relationship between the mass of a ball and the greatest height reached by the ball. The ball was placed on a spring which was then compressed fully before being released. The ball jumped up to a maximum height of  $H$  cm as shown below.



She repeated the procedure with balls of different masses. The table below shows her results.

Mass of ball (g)	Greatest height reached by ball, $H$ (cm)			
	Trial 1	Trial 2	Trial 3	Average
20	20	22	21	21
40	19	17	18	18
60	16	15	14	15
80	12	11	10	11

- (a) What is the relationship between the mass of the ball and height  $H$ ? [1]

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- (b) Why did Farah repeat her experiment? [1]

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- (c) Suggest one change to Farah's set-up to make the ball of 20g bounce to a greater height. [1]

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- (d) Explain your answer in (c) [2]

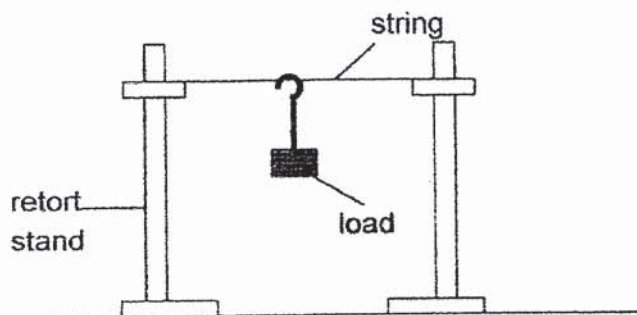
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36. Ray used the set-up as shown below.



He used strings made of different materials, X, Y and Z. He increased the mass of the load that was hung onto the string until the string broke. His results are shown below.

Material	Smallest mass of the load that caused the material to break (kg)
X	0.5
Y	5.0
Z	3.0

(a) State the property of the strings that Ray is testing.

[1]

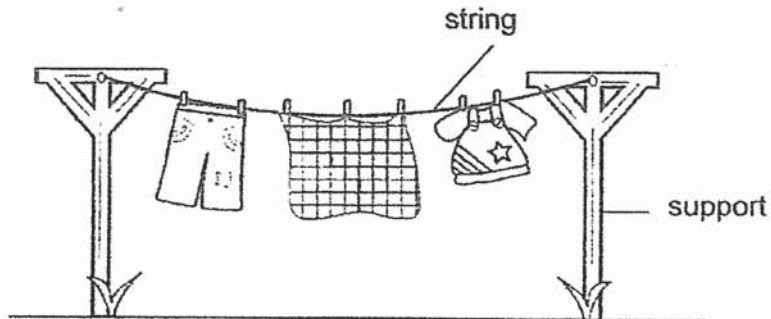
(b) Which of the following variables should Ray keep constant in order to ensure a fair test? Put a tick (✓) in the correct box(es).

[1]

	Variables	To be kept constant
i.	Material of string	
ii.	Number of string(s)	
iii.	Mass of load hung onto each string until it breaks	
iv.	Distance between the two retort stands	



The diagram below shows a set-up for drying wet clothes.



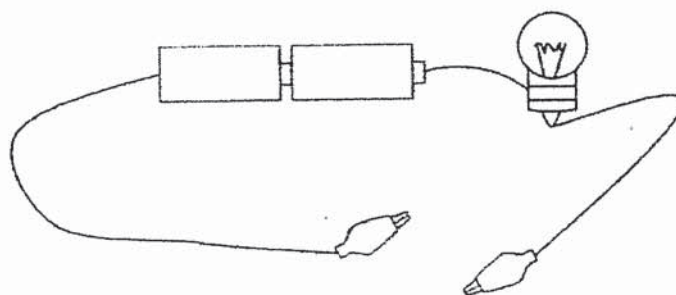
- (c) Based on his results, which material, X, Y and Z, is most suitable to make the string for the wet clothes to be hung? Explain your answer. [1]

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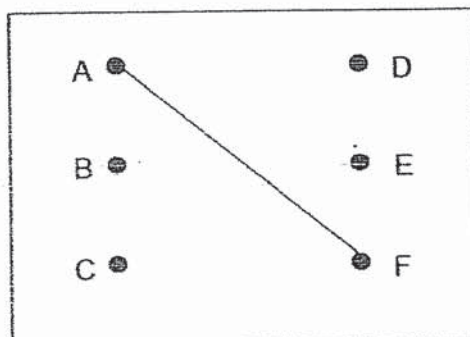


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37. Jerry set up a circuit tester as shown.



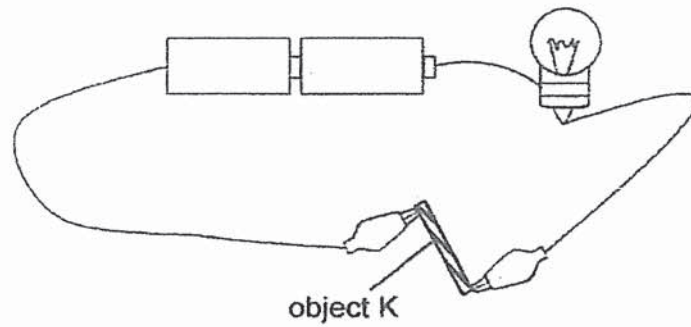
He connected the circuit tester to a circuit card as shown below.



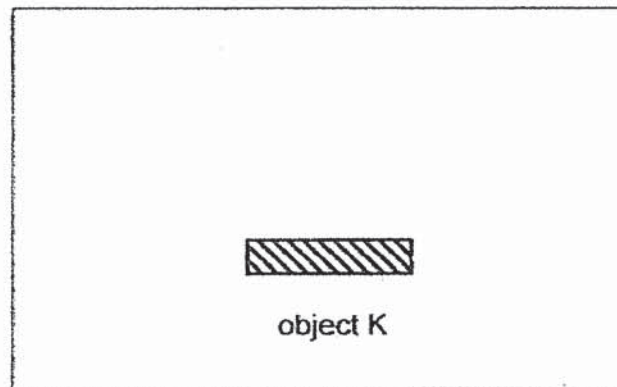
- (a) Put a tick (✓) in the correct box(es) to indicate whether the bulb of the circuit tester will light up when it is connected to the following points in the circuit card above. [1]

Clips tested	Bulb of circuit tester lighted up
A and C	
A and E	
B and D	
B and F	

Jerry then connected object K to the circuit tester as shown below.



- (b) Based on the set-up above, complete the circuit diagram using circuit symbols in the box below. [2]



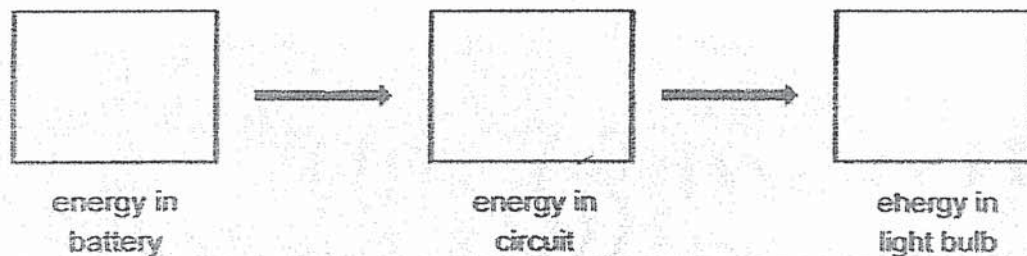
- (c) What can you conclude about object K when the bulb lit up? [1]

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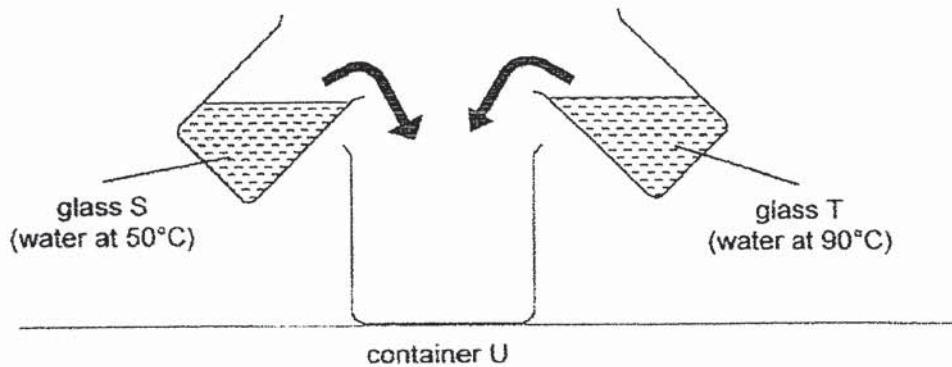


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- (d) Fill in the boxes to show the energy changes in (c). [1]



Jessica conducted an experiment using two glasses with equal volumes of water. The room temperature was  $26^{\circ}\text{C}$ .



- (a) What is the likely temperature of the water in container U immediately after all the water from both glasses was poured in? [1]

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

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- (c) What is the likely temperature of the water in container U after 6 hours? [1]

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- (d) Explain your answer in (c). [1]

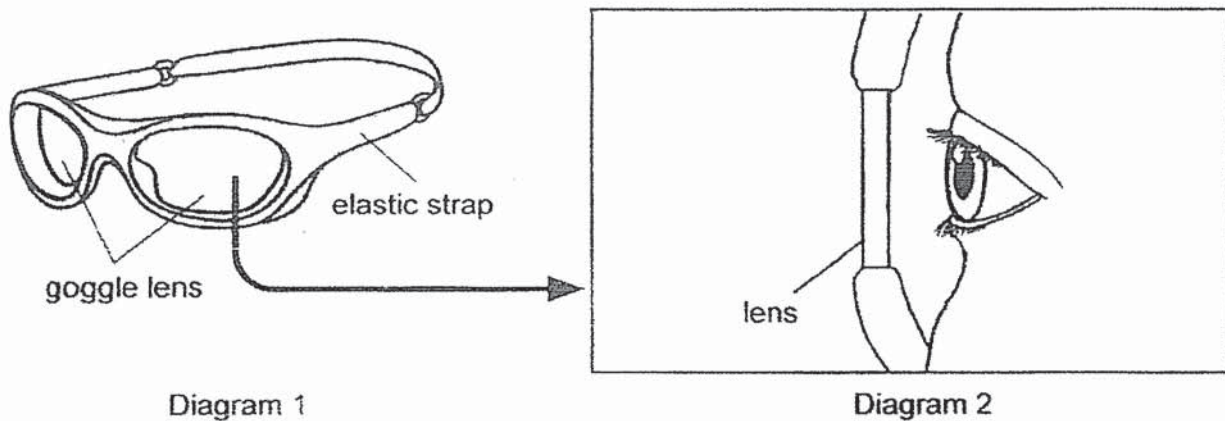
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39. The diagrams below show a pair of goggles Matthew used for swimming. He observed his lens fogging up while wearing it underwater, preventing him from seeing clearly.



- (a) Draw in Diagram 2 above to show which side of the lens the water droplets are formed on. [1]
- (b) Explain how the water droplets were formed. [2]

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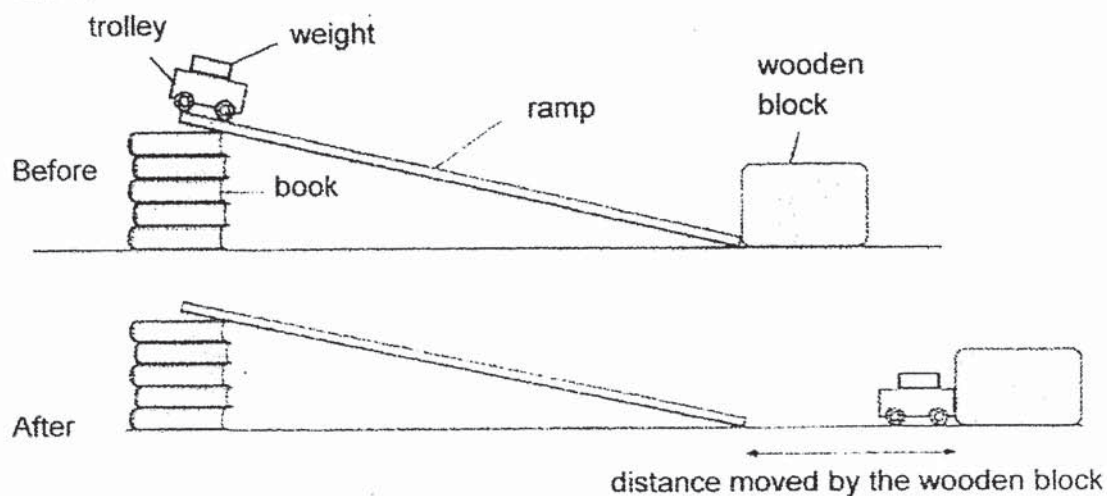


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40. Mark wanted to find out how the number of weights placed in a toy trolley affected the distance moved by a wooden block. He added a 50 g weight to the trolley each time before releasing it and measured the distance travelled by the block.



- (a) Mark used the same wooden block throughout his experiment. How does this ensure a fair test? [1]

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- (b) Mark found out that the toy trolley with the greatest mass had the most gravitational potential energy at the top of the ramp. What result did Mark obtain to conclude this? [1]

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- (c) Suggest another way Mark can make the same wooden block move a greater distance without changing the toy trolley. Explain how. [2]

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## ANSWER KEY

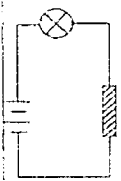
YEAR : 2021  
LEVEL : PRIMARY 6  
SCHOOL : TAO NAN  
SUBJECT : SCIENCE  
TERM : MID-YEAR EXAM

### BOOKLET A

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



On	Ans Key
29a)	The brightly-coloured flowers attract animals / insects / pollinators.
b)	Animals ate the fruit together with the seeds, moved some distance away and passed the seeds out in their droppings away from the parent plant
c)	It helps to prevent overcrowding OR It reduces competition for sunlight, water, mineral salts and space.
30a)	Organism Y feeds on Organism X that feeds on the blood of Organism Z
b)	Organism Z provides a source of food for Organism Y.
c)	No. Organism X has 8 legs but insects have 6 legs
31a)	_____ J ----- K
b)	The population of J will decrease as J has less plants to feed on. K has fewer J to feed on so the population of K will decrease
32a)	i) B ii) D
b)	His heart rate increased as his heart pumped blood faster to send oxygen and digested food faster to all parts of the body.
c)	All systems ticked.
33a)	Organism Q helps Animal P to camouflage among the trees to avoid being easily spotted by their predators.
b)	The droppings of Animal Z provides nutrients for the tree when it decomposes
c)	Animal Z can use its sharp claws to scratch/injure/hurt its predators. Its flexible neck/spine/ability to rotate its head can help it spot predators more easily/earlier/behind so that it can get ready to escape from the predators first/earlier
34a)	Frictional force
b)	Friction between the knife blade and object M produces heat.
c)	The knife must be strong to cut an apple without breaking.
35a)	As the mass of the ball increase, the height H decreases.
b)	To ensure her results are reliable.

On	Ans Key										
35c)	Replace the original spring with a thicker/stiffer/longer spring.										
d)	There will be more (elastic) potential energy in the compressed spring that can be converted to more kinetic energy of the spring which is converted to more (gravitational) potential energy.										
36a)	Strength										
b)	<table border="1"> <thead> <tr> <th>Statements</th><th>Variables</th></tr> </thead> <tbody> <tr> <td>i. Material of String</td><td></td></tr> <tr> <td>ii. Number of strings</td><td>✓</td></tr> <tr> <td>iii. Mass load hung onto each string until it breaks</td><td></td></tr> <tr> <td>iv. Distance between the two retort stands</td><td>✓</td></tr> </tbody> </table>	Statements	Variables	i. Material of String		ii. Number of strings	✓	iii. Mass load hung onto each string until it breaks		iv. Distance between the two retort stands	✓
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i. Material of String											
ii. Number of strings	✓										
iii. Mass load hung onto each string until it breaks											
iv. Distance between the two retort stands	✓										
c)	String Y. It is the strongest string and could hold the most mass before breaking, so it can hold the most wet clothes without breaking.										
37a)	<table border="1"> <thead> <tr> <th>Clips tested</th><th>Bulb of circuit tester lights up</th></tr> </thead> <tbody> <tr> <td>A and C</td><td></td></tr> <tr> <td>A and E</td><td></td></tr> <tr> <td>B and D</td><td></td></tr> <tr> <td>B and F</td><td>✓</td></tr> </tbody> </table>	Clips tested	Bulb of circuit tester lights up	A and C		A and E		B and D		B and F	✓
Clips tested	Bulb of circuit tester lights up										
A and C											
A and E											
B and D											
B and F	✓										
b)											
c)	It is a conductor of electricity/ electrical conductor/ allows electricity to pass through/ conducts electricity.										
d)	potential energy (battery) electrical energy (circuit) light energy (light bulb)										
38a)	Any temperature between 55°C and 85°C										
b)	Heat travels from hotter water to colder water. OR Heat from the water in T is lost to the water in S.										
c)	26°C / Room temperature										
d)	The water would lose heat to the surroundings until the temperature of the water reaches room temperature/equilibrium.										

Qn	Ans Key
39a)	Draw water droplets on the inner side of the lens (facing the eyes) only
b)	<p>The warmer water vapour (in the air) inside the goggles came into contact/ touched with the cooler (inner) surface of the lens...</p> <p>or</p> <p>Warm water vapour in the goggles came into contact with the cool lens. . .</p> <p>... lost heat to the surface and turned to water droplets</p> <p>or</p> <p>... condensed into water droplets.</p>
40a)	This will ensure mass/texture of wooden block does not affect distance moved by the wooden block/the results
b)	The distance moved by the wooden block is the greatest.
c)	Add more books to the ramp. This will increase the height of the ramp and increase the GPE of the trolley which will convert to greater KE of the moving trolley, transferring more KE to the wooden block.

