

henrypark_p6_sa2_2024



HENRY PARK PRIMARY SCHOOL
2024 PRELIMINARY EXAMINATION
STANDARD SCIENCE
PRIMARY SIX
BOOKLET B

Name: _____ ()

Class: Primary 6 ()

12 QUESTIONS

44 MARKS

TOTAL TIME FOR BOOKLETS A & B: 1 HOUR 45 MINUTES

INSTRUCTIONS TO CANDIDATES

1. Do not turn over this page until you are told to do so.
2. Follow all instructions carefully.
3. Answer all questions.

Marks for Booklet B: _____ / 44

For questions 29 to 40, write your answers in this booklet. The number of marks available is shown in brackets [] at the end of each question or part question. (44 marks)

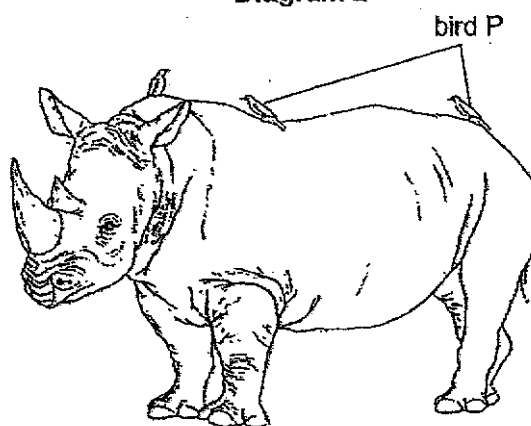
- 29 Diagram 1 shows animal T, a very small animal that lives on the body of animal R. Animal T punctures the skin of animal R to feed on its blood. Diagram 2 shows bird P standing on animal R. Bird P feeds on animal T.

Diagram 1



Animal T
(enlarged picture)

Diagram 2



Animal R

- (a) How do bird P and animal R benefit from each other? [2]

Benefit for bird P: _____

Benefit for animal R: _____

Animal R has poor vision and is hunted by humans for its body parts.

The table below shows the average distance from which animal R is able to spot humans and the frequency of spotting humans with and without bird P standing on its body.

	With bird P	Without bird P
Average distance of spotting humans (m)	61	27
Average frequency of humans being spotted (%)	100	23

- (b) Using the information from the table above, explain the effect of bird P's presence on the chances of survival of animal R. [2]

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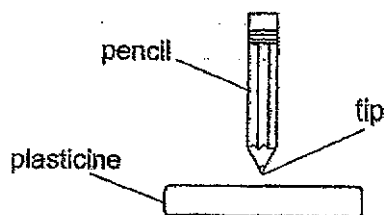
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2

- 30 Asher conducted an experiment to find out how the type of pencil tip affects the depth it pierces into a block of plasticine. He used two identical pencils with different tips and dropped them from the same height.



He recorded his results in the table below.

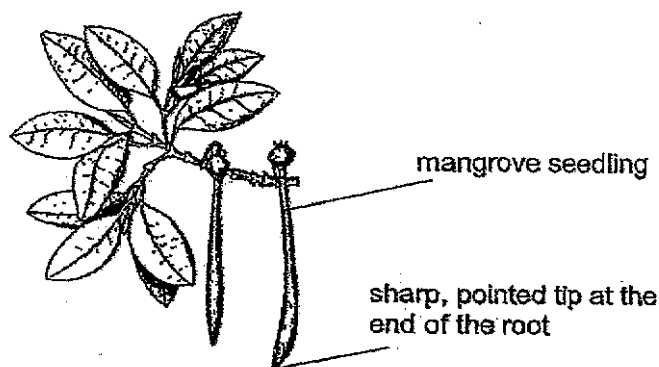
Type of pencil tip	Depth of piercing (cm)	Does the pencil stay in the plasticine?
	1	No
	2	Yes

- (a) How does the type of pencil tip affect the depth of piercing?

[1]

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Mangrove trees grow in coastal areas that can be muddy or even flooded, depending on the tide. Mangrove seeds germinate while on the tree. Once the seedlings can make their own food, they drop into the soil below the parent plant.



- (b) Based on Asher's experiment, explain how having a sharp tip at the end of the root increases the chance of the seedling growing into an adult plant.

[1]

- (c) State a disadvantage when the seedling drops into the muddy soil below the parent plant and grows there.

[1]

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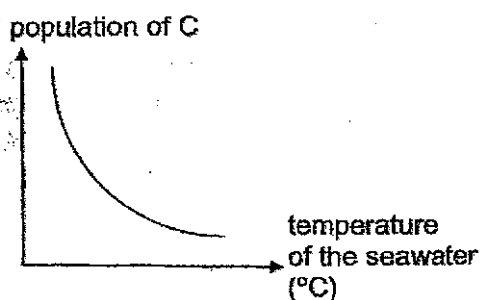
- 31 Alex carried out an experiment to find out how exercise affects his heart rate. His results are shown in the table below.

When heart rate was measured	Heart Rate (beats per minute)
Before exercise	75
Immediately after running	140
After 5 minutes of rest	90

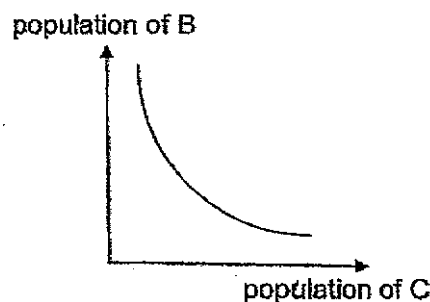
Explain the decrease in his heart rate after resting.

[2]

- 32 Living things B and C live in the sea. The 2 graphs below show how an increase in the temperature of the sea affects the populations of living things B and C.



Graph 1



Graph 2

- (a) What happens to the population of living thing B when the temperature of the seawater increases? [1]
- (b) State the relationship between living things B and C. [1]
- (c) Explain your answer in (b) using information from graphs 1 and 2. [2]

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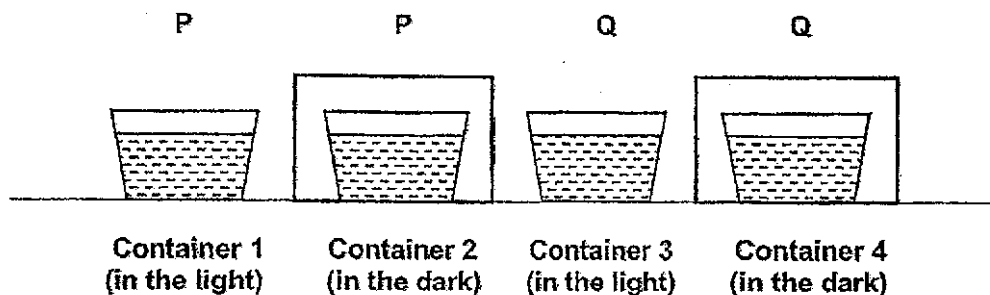
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- 33 Jaffar found two living things, P and Q, in a pond. He wanted to find out whether they were animals or plants. He filled four containers 1, 2, 3 and 4 with pond water.

He placed living thing P in containers 1 and 2 and living thing Q in containers 3 and 4. Containers 1 and 3 were placed in the light. Containers 2 and 4 were placed in the dark as shown below.



Observe the experimental set-ups shown above.

- (a) Suggest one way Jaffar has ensured that the experiment is a fair test. [2]

Explain your answer.

Jaffar added a drop of liquid X in each container. The table below shows the colour of liquid X in the presence of more oxygen or more carbon dioxide.

Colour of liquid X	When more oxygen is present	When more carbon dioxide is present
	blue	yellow

At the end of two hours, the following results were obtained.

Container	Colour of Liquid X
1	yellow
2	yellow
3	blue
4	yellow

Based on the results, Jaffar concluded that P was an animal.

- (b) Is Jaffar's conclusion correct? Explain your answer. [2]

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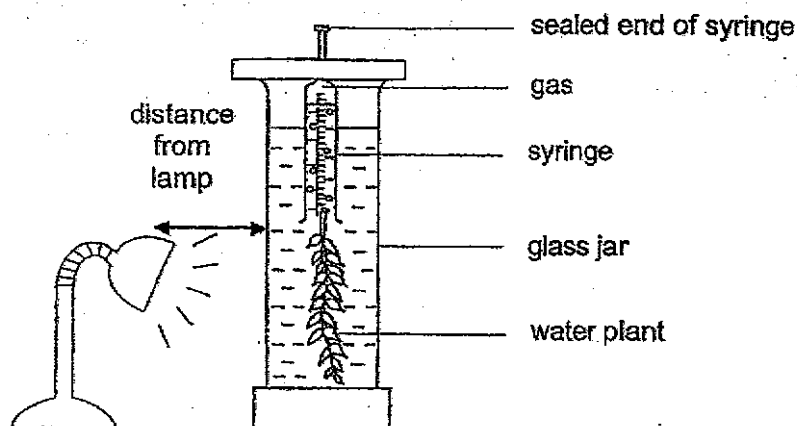
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5

- 34 Mel set up the experiment shown below to investigate how temperature affects the rate of photosynthesis.



The number of bubbles produced per minute was counted at different temperatures and recorded in the table below.

Temperature (°C)	Number of bubbles produced per minute		
	Trial 1	Trial 2	Trial 3
10	7	6	8
15	12	14	11
20	20	19	17
25	36	34	32
30	50	52	51
35	42	44	45
40	3	2	1

- (a) How did Mel measure the rate of photosynthesis in this experiment? [1]

- (b) How does carrying out the experiment 3 times make the results more reliable? [1]

- (c) Name another factor needed for the water plant to make food. [1]
Explain how this factor can be kept the same throughout the experiment.

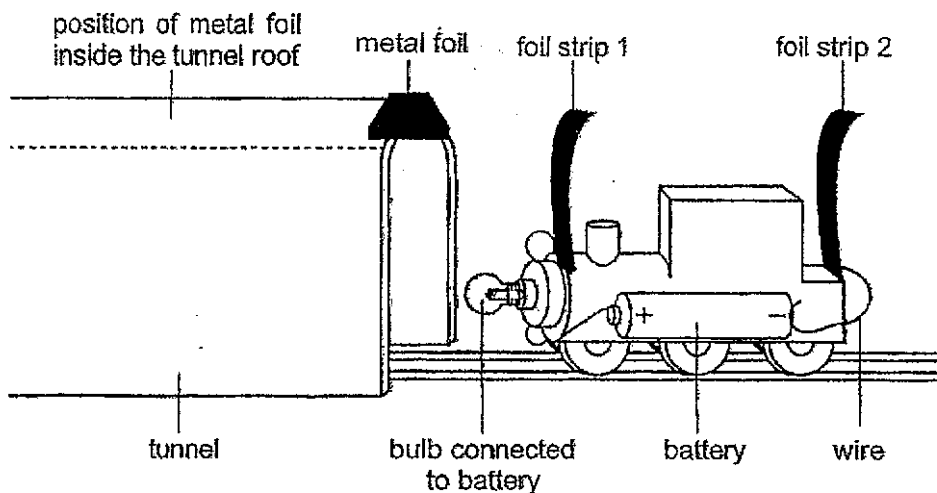
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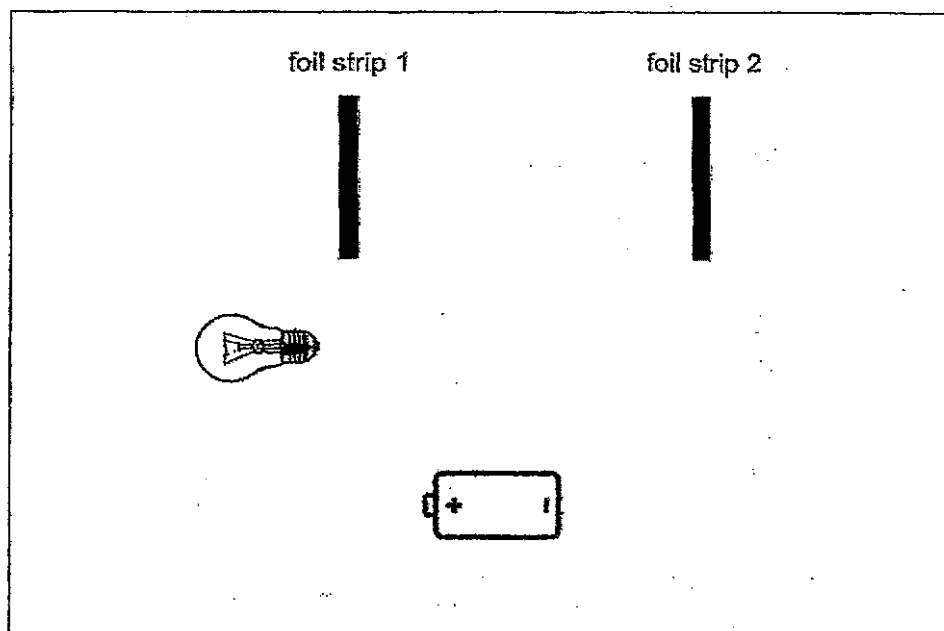
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- 35 Sarah wants a light bulb to light up when her toy train is pushed through a tunnel. She makes a tunnel using cardboard and puts a strip of metal foil inside the tunnel roof as shown below.



She realised that the bulb was too dim when the toy train was inside the tunnel.

- (a) Add another battery and complete the circuit below so that the light bulb becomes brighter when the circuit is closed. [2]



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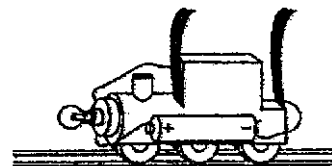
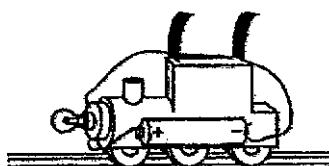
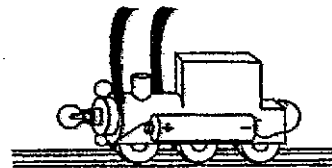
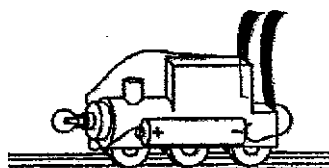
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Question 35 continued

Sarah wants to improve her circuit so that the bulb lights up as soon as the train enters the tunnel.

(b) Which design should she use? Put a tick (✓) in the box.

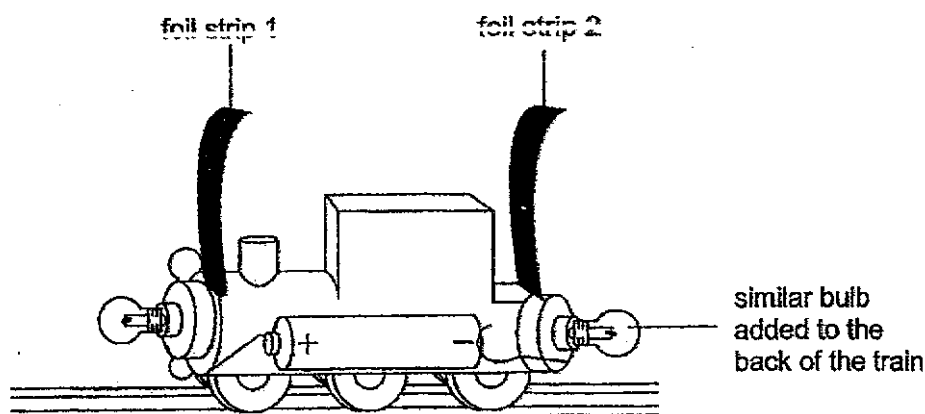
[1]



(c) Explain your choice in (b).

[1]

Sarah connected another similar bulb at the back of her train as shown below.



(d) Will the brightness of the first bulb increase, decrease or remain the same? Explain your answer. [1]

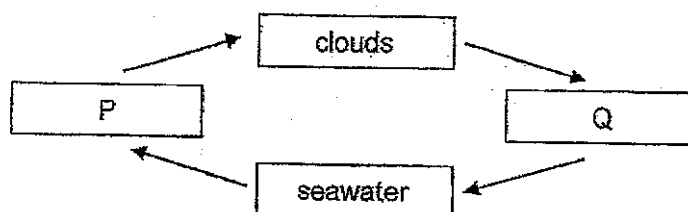
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- 36 The diagram below shows the water cycle.



- (a) Identify the states of matter of P and Q.

[1]

P: _____

Q: _____

Siti took a tub of ice cream from the freezer and placed it on a table.
After a short time, a thin layer of white solid was formed on the surface of the tub.



- (b) Explain how the white solid was formed.

[2]

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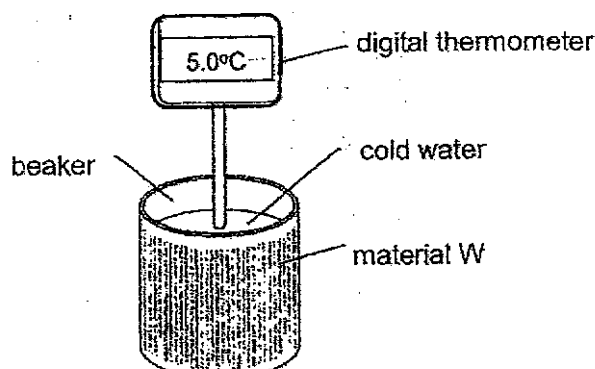
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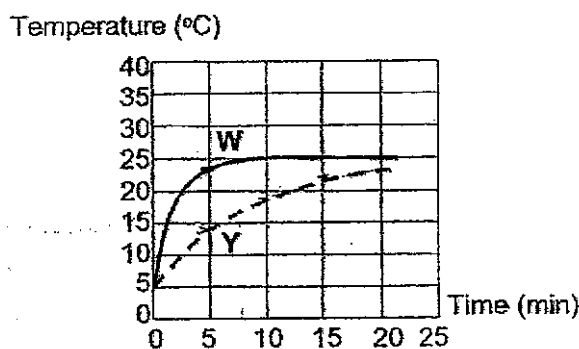
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9

- 37 Ming Li conducted an experiment using the set-up shown below. He measured the temperature of the cold water at different times in the room.

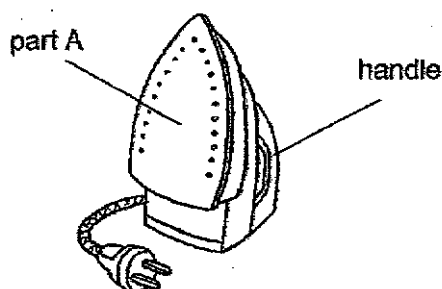


He repeated the experiment using material Y. He plotted his results as shown below.



- (a) From the graph, state the room temperature. [1]

The diagram shows an iron.



When part A of the iron is heated, the handle must be cool enough to be used safely by Ming Li.

- (b) Which material, W or Y, should be used to make the handle? Explain your answer. [2]

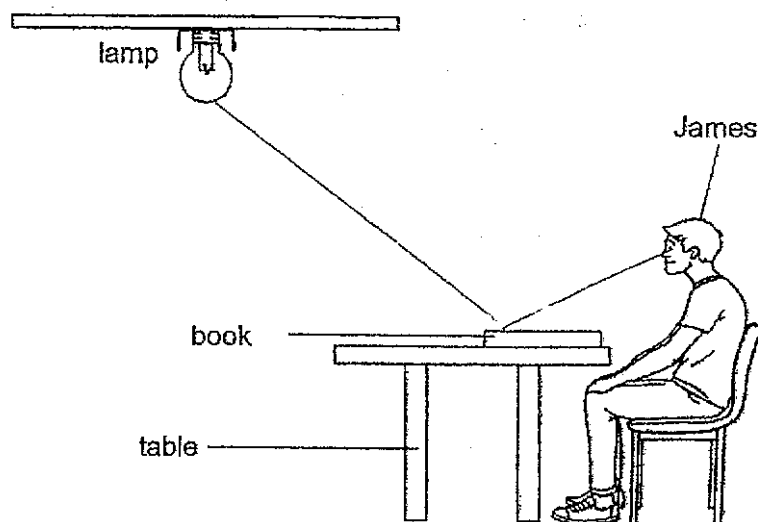
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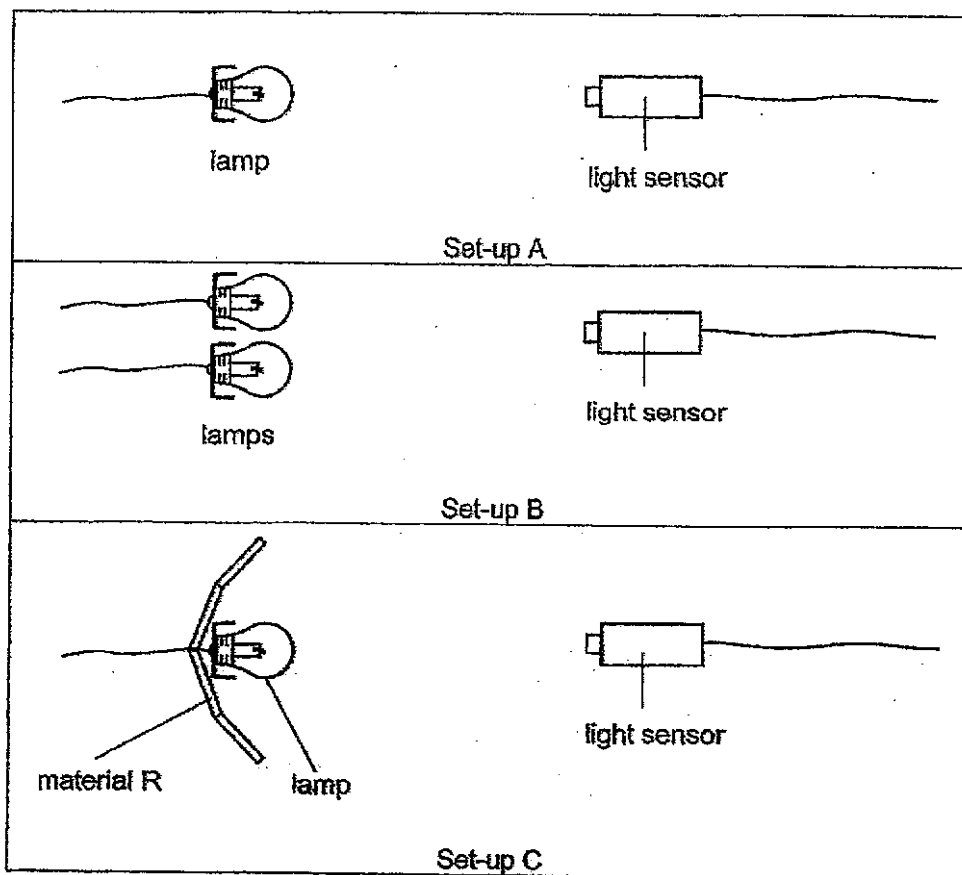
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- 38 (a) In the diagram below, draw arrows to show the path of light which enables James to see the book. [1]



James wanted to find out the amount of light detected when different set-ups, A, B or C, are used. Similar lamps were used for all 3 set-ups.



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Question 38 continued

His results are shown in the table below.

Set-up	Amount of light detected (unit)
A	200
B	400
C	400

- (b) Based on the results, state a useful property of material R. [1]

- (c) What is an advantage of using material R instead of 2 lamps? [1]

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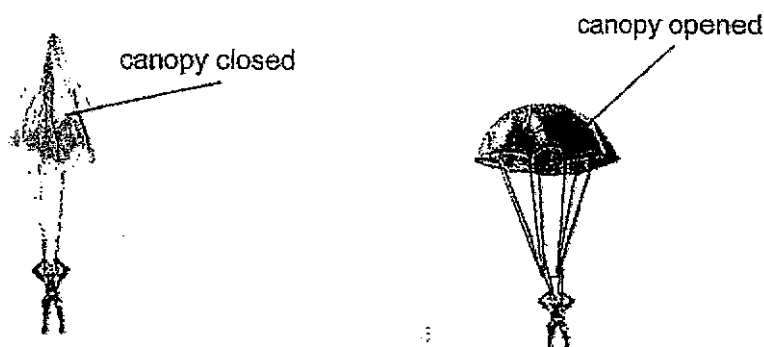
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- 39 (a) State what frictional force is.

[1]

Nathan conducted an experiment with a toy parachute. He released it with the canopy closed and then opened, from a height of 10 metres, as shown in the diagram.



He recorded his findings in the table shown below.

Condition of canopy	Time taken for parachute to reach the ground (s)			
	1 st try	2 nd try	3 rd try	Average
closed	5	4	6	5
opened	8	10	9	9

- (b) How does the condition of the canopy affect the time taken for the toy parachute to reach the ground? [1]

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13

Question 39 continued

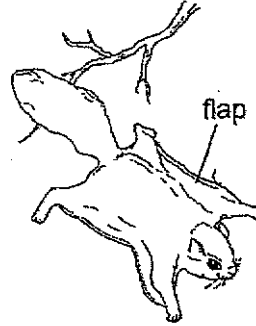
The diagrams below show animal K.

Diagram 1



Animal K resting on a tree trunk

Diagram 2



Animal K using large flaps of its skin to glide to another tree

- (c) Name 2 forces that are acting on animal K when it is gliding. [1]

(i) _____ (ii) _____

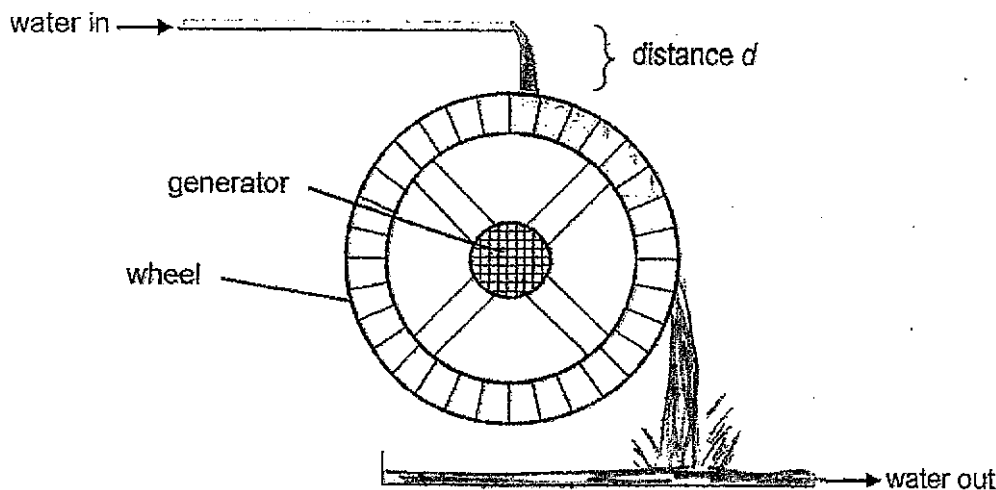
- (d) Based on the findings of Nathan's experiment, explain how using large flaps of its skin to glide increases the survival of animal K. [2]

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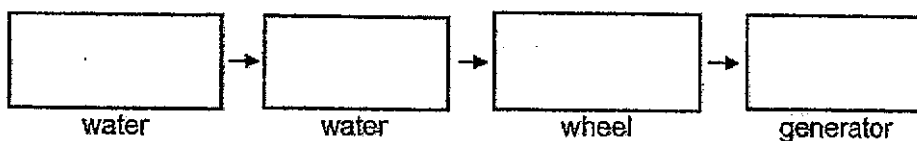
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- 40 The diagram shows how a water wheel is used to generate electricity.
Water flows down from the top and turns the wheel.
A generator connected to the wheel at the centre produces electricity.



- (a) Fill in the boxes with the main forms of energy as the water flows down. [2]



- (b) How does the amount of electricity produced by the generator change when distance d increases? [2]

Explain your answer in terms of energy conversion.

- (c) How does using the water wheel to produce electricity benefit the environment? [1]

End of Booklet B

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Booklet A

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

Booklet B

29

- (a) Benefit for bird P: Bird P has access to food and is able to feed on Ton R's body.
Benefit for animal R: R does not have skin punctured by T as P preys on T.
- (b) If bird P is present, the chance of R spotting the humans is higher, and is able to spot them further away and 100% of the time, than if bird P was not present, allowing R to have a higher chance to escape being hunted by humans.

30

- (a) The sharp pencil tip pierces plasticine deeper than the blunt pencil tip.
- (b) A sharp tip of the mangrove seedling allows it to pierce into the soil deeper, and is able to stay in the soil, increasing the chance for the mangrove seed to grow into an adult plant.
- (c) The mangrove seedling will have to compete with the parent plant for space, sunlight, nutrients as it is overcrowding. (notes: please do not include water due to mangroves living in water, cannot compete)

31

Alex needed to use less energy when resting than running, reducing rate at which heart pumps, pumping less blood containing oxygen and digested food through the blood vessels to all parts of the body to respire less and releasing less energy and carbon dioxide, decreasing heart rate at her resting.

32

- (a) Population of organism B increases.
- (b) C is the predator of B, preying on B, and B is the prey of C.
- (d) As temperature of sea water decreases, population of C increases, population of B decreases, as more C prey on more B, decreasing number of B, and therefore population of B.

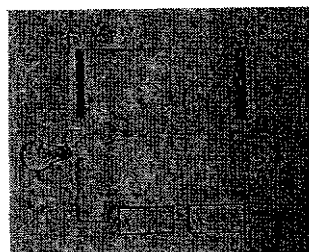
33

- (a) The amount of water on all the containers was the same to ensure amount of oxygen and carbon dioxide in water is same.
- (b) Yes, Q was affected by presence or absence of light while P was not affected by presence or absence of light. Plants use light, water and carbon dioxide to photosynthesize, affecting them while animals are not affected and do not use light making setups yellow, therefore P is animal.

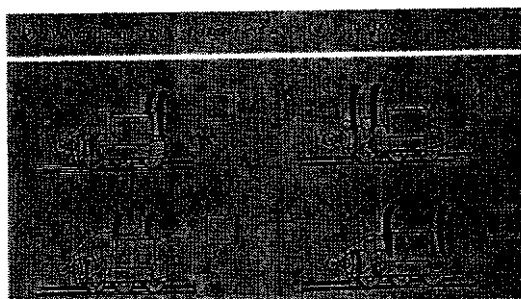
34

- (a) Mel measured the rate of photosynthesis by measuring number of bubbles per minutes.
- (b) It ensures that results are consistent so as to make it a fair test.
- (c) Carbon dioxide. Pump the same amount of carbon dioxide into the glass jar at the start of each Trial, keeping the amount of carbon dioxide the same.

35



(a)



(b)

- (c) The foil strips at the front will be the quickest design for the foil strips to come into contact with the metal foil, closing the circuit the quickest, also electric current to flow through bulb quickest, lighting it up fastest.
- (d) Decrease. The bulbs are connected in series arrangement, making less electric current to flow through both bulbs, decreasing brightness of first bulb.

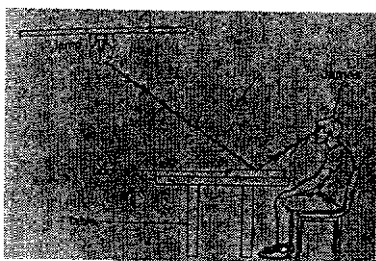
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- (a) P: Gaseous state Q: liquid state
- (b) The water vapor in the surrounding air come into contact with cooler surface of tub, losing heat to form water droplets, which lost heat to cooler surface of tub, freezing to form smaller pieces of ice on the surface of tub, which is the white solid

37

- (a) 25 C
- (b) Y. Y is a worse conductor of heat than W, as it gained heat to return to room temperature in a longer period of time than W, so Y would gain heat from A slower than W, allowing user to hold the iron a longer period of time, therefore Y should make the handle.

38



- (a)
- (b) R reflects light.
- (c) It allows for the use of only one bulb instead of two and produces the same amount of light, saving amount of electricity used.

39

- (a) Frictional force is a push force opposite to direction of which an object is moving, slowing it down. This causes wear and tear.
- (b) When canopy is closed, it takes a shorter amount of time to reach the ground, than when canopy is opened.
- (c) (i) Gravitational force (ii) Frictional force
- (d) It allows K to escape from predators easier as it remains a longer time not on ground, making it harder to spot.

40

- (a) Gravitational potential energy → Kinetic energy → Kinetic energy → Electrical energy
- (b) As d increases, water at the top has more gravitational potential energy, converted to more kinetic energy when running water falls, converted to more

kinetic energy of wheel, converted to more electrical energy by generator and producing more electricity.

- (c) The water wheel does not produce harmful chemicals or greenhouse gases, reducing climate change, benefiting the environment.