NANYANG PRIMARY SCHOOL

2022
PRIMARY 4
MID-OF-YEAR EXAMINATION

SCIENCE
(BOOKLET A)

Total Time for Booklets A and B: 1 h 45 min

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not open this booklet until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. For each question from 1 to 28, four options are given.
   Indicate your choice in this booklet.
   Shade the correct oval (1, 2, 3 or 4) on the Optical Answer Sheet provided.

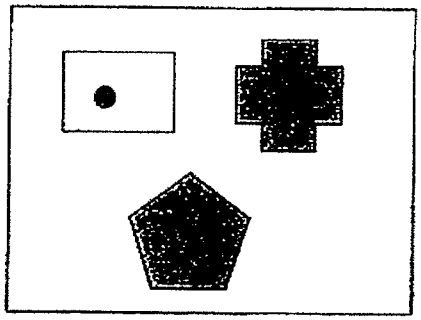
Name:_____( )

Class: Primary 4 ( )

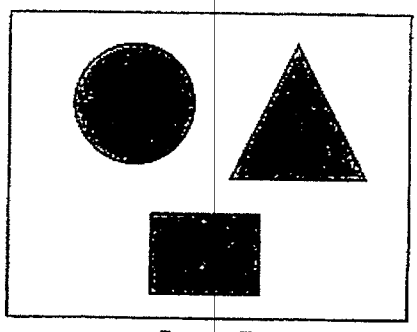
Booklet A consists of 17 printed pages excluding this cover page.

Section A: Multiple Choice Questions [56 marks]

1. Study the diagrams below.



Group A

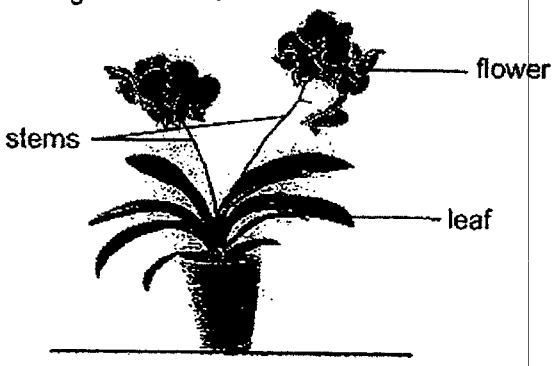


Group B

How are the objects classified into groups A and B?

(1) By their sizes.
(2) By their shapes.
(3) By their colours.
(4) By the number of dots in them.

2. Gemma saw Plant X in the diagram below.



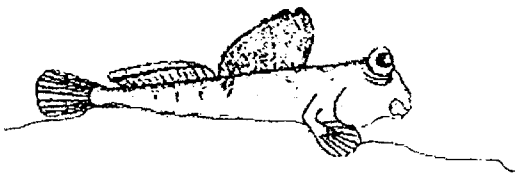
She recorded her observations below.

A It bears flowers.
B It grows in a pot.
C It reproduces by spores.
D It needs a support for its stem.

Which of her observations are correct?

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

3. The diagram below shows Animal P.



The characteristics of animal P are as follows:

A It lays eggs.
B It has fins and a tail.
C It breathes through its gills.
D It has scales.

Which animal group would animal P most likely belong to?

(1) Fish
(2) Insect
(3) Amphibian
(4) Mammal

4 Samy observed organisms X and Y and recorded their characteristics in the table below. A tick (✓) indicated that the organism has the characteristic.

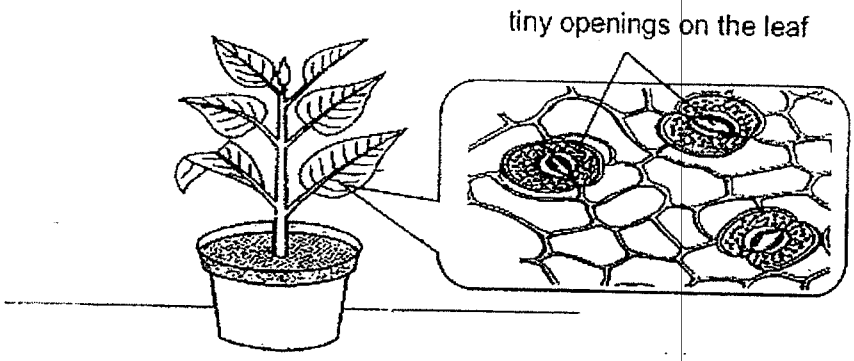
Characteristic	Organism X	Organism Y
Has moist skin		✓
Adult lays eggs	✓	✓
Has a beak	✓	
Lives on land and in water		✓

Based on the information above, which of the following statements are definitely true about organisms X and Y?

A X is a bird.
B X has dry scales.
C Y is an amphibian.
D Y feeds on the organisms that it grows on.

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

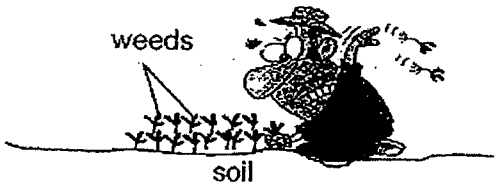
5. Tiny openings are found on the leaves as shown in the diagram below.



What is the function of these tiny openings found on the leaves?

(1) To hold the plant upright.
(2) To take in water for the plant.
(3) To hold the plant firmly to the soil.
(4) To help the plant take in and give out gases.

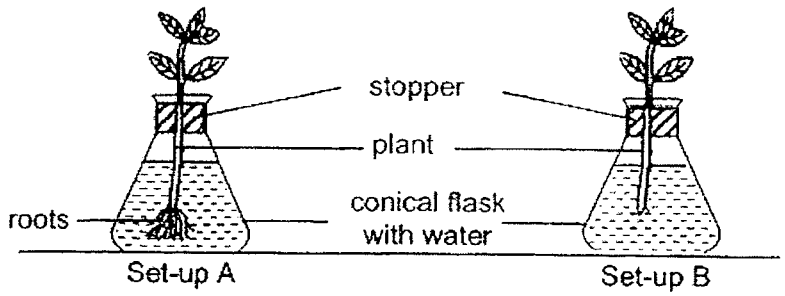
6. Farmer Tom found some unwanted plants called weeds growing in his vegetable garden. He tried to pull the weeds out as shown in the diagram below.



What is the possible reason that Tom found it difficult to pull out the weeds?

(1) The soil is wet.
(2) The weeds are growing upright.
(3) The leaves of the weeds are big.
(4) The roots hold the weeds firmly to the ground.

7. Sam carried out an experiment under the hot sun as shown in the diagram below.



He measured the volume of water after 5 hours and recorded the results in the table below.

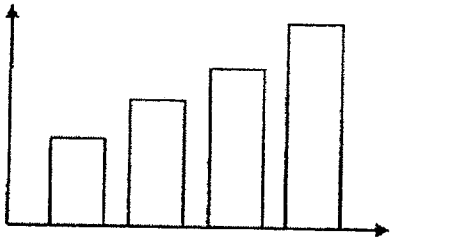
Set-up	Amount of water at first (ml)	Amount of water after 5 hours (ml)
A	400	255
B	400	320

Which one of the following statements is the correct conclusion for the experiment?

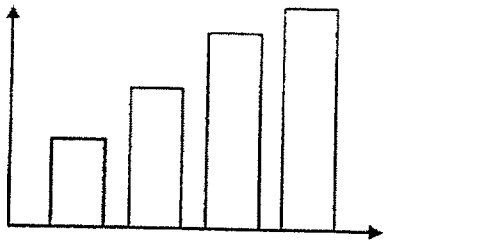
(1) Plants with more roots take in more water from the flask than plants without roots.
(2) Plants with less leaves take in more water from the flask than plants with more leaves.
(3) Plants with less roots give out more water to the surroundings than plants without roots.
(4) Plants with more leaves give out more water to the surroundings than plants with less leaves.

8. Muhammad observed how light had affected the growth of several pots of plant T. At the start, the plants were of the same height and had the same number of leaves. He made his observations over a few weeks and recorded his observations in the graphs below.

Number of leaves

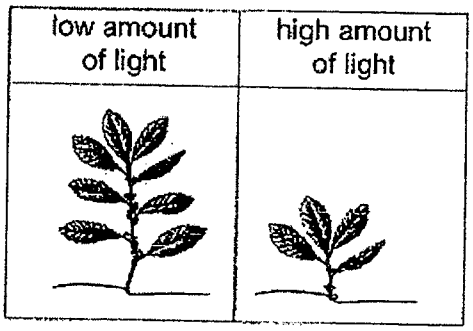


Height of plant T

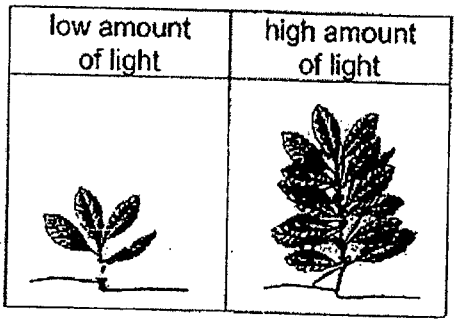


Which of the following will most likely be plant T under different amounts of light?

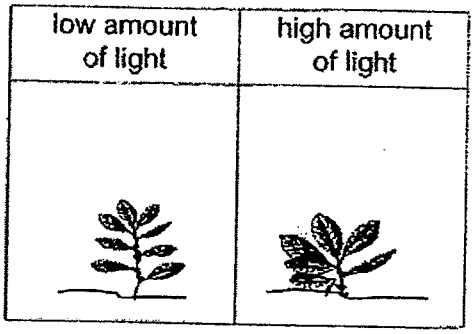
(1)



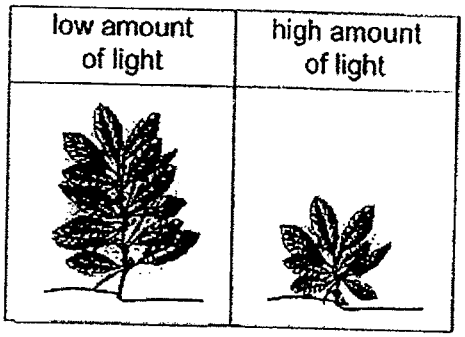
(2)



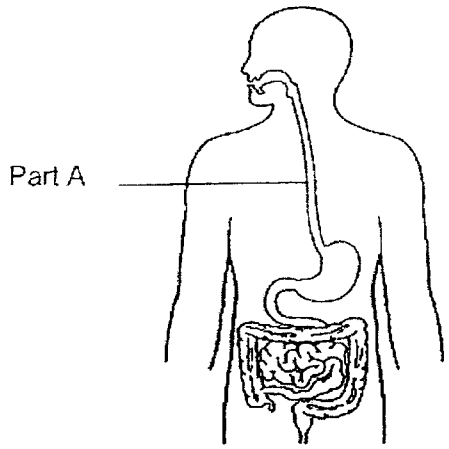
(3)



(4)



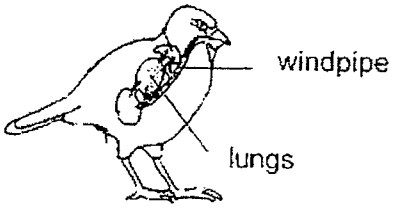
9. The flowchart below shows part of the digestive system.



What is part A?

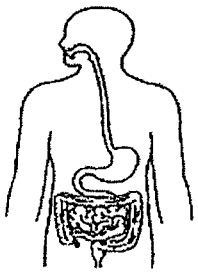
(1) gullet
(2) mouth
(3) stomach
(4) large intestine

10. Study the diagram below.

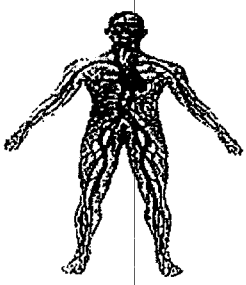


Which one of the following human systems has the same function as the system of the bird shown in the diagram above?

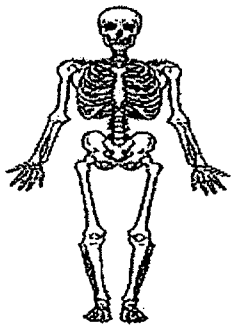
(1)



(2)



(3)



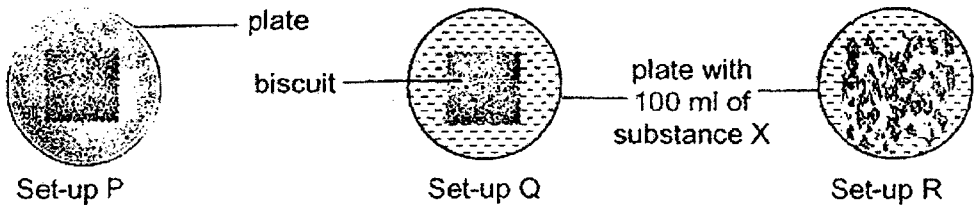
(4)

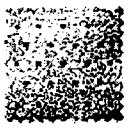
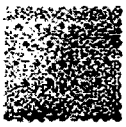
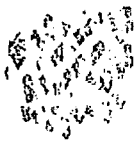
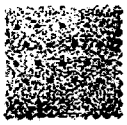
11. Which of the following statements about digestion is/are true?

A Digestion ends in the stomach.
B Our teeth chew and grind the food into smaller pieces.
C Small intestine produces digestive juices that help in digestion.
D Digested food passes through the walls in the large intestine.

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

12. Samuel wanted to find out how substance X affects how fast the food is digested. He broke identical biscuits into different sizes and placed them onto a plate with 100 ml of substance X as shown in the diagram below. He made his observations and recorded the results after 1 hour in the table below.

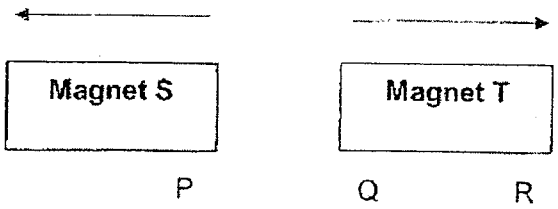


	Set-up P	Set-up Q	Set-up R
Biscuit at the start of the experiment			
Biscuit at the end of the experiment			

What could Samuel conclude from this experiment?

(1) Digestion takes place without substance X.
(2) It takes a longer time to digest smaller pieces of biscuits.
(3) It takes a shorter time to digest smaller pieces of biscuits.
(4) The size of the biscuit does not affect how fast it is digested.

13. The diagram below shows magnets S and T pushing each other away.



What could the poles marked P, Q and R be?

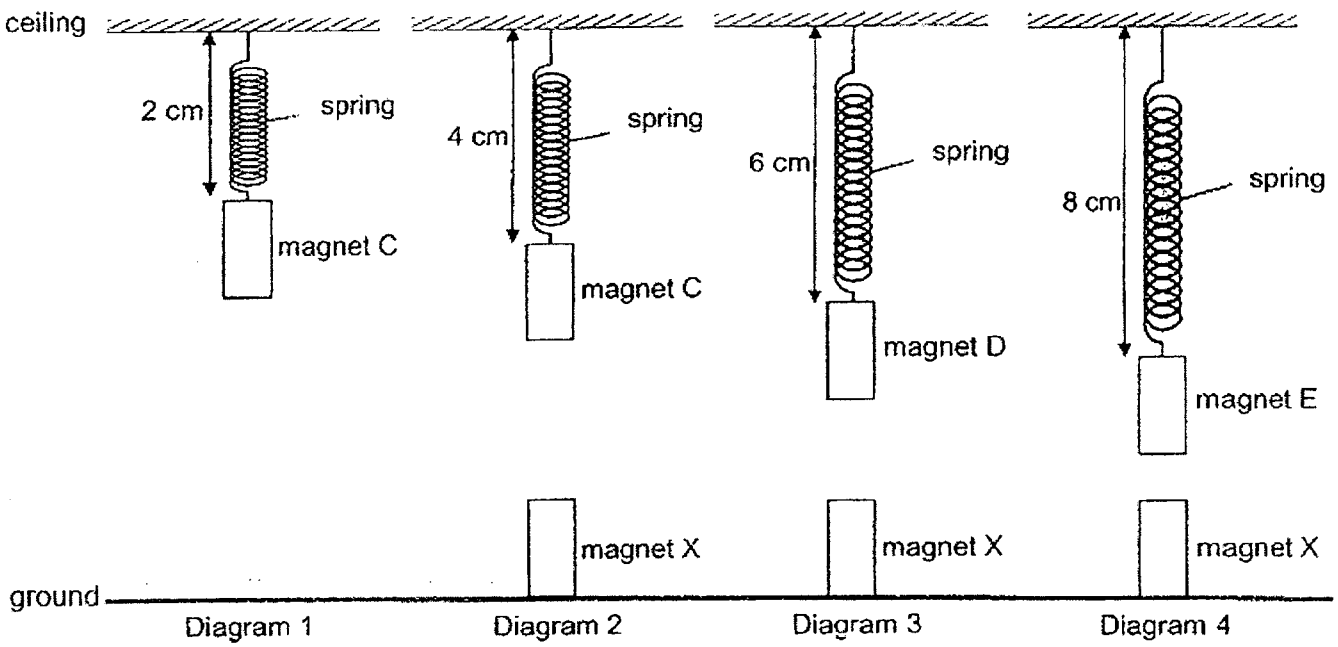
	P	Q	R
(1)	N	N	N
(2)	N	S	S
(3)	S	N	S
(4)	S	S	N

14. Magnet C was hung from a spring as shown in diagram 1.

Magnet X was then placed on the ground, directly below magnet C as shown in diagram 2. The spring increased length from 2 cm to 4 cm.

The experiment was repeated by replacing magnet C with magnet D as shown in diagram 3 and with magnet E as shown in diagram 4.

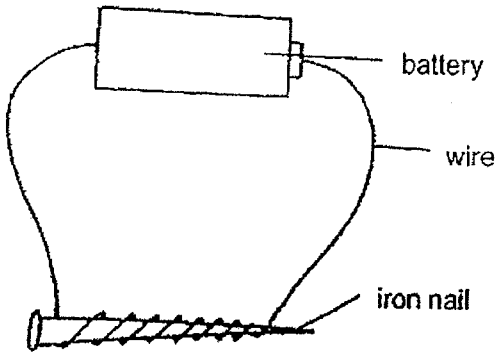
All the magnets have the same weight.



Which one of the following statements is correct?

(1) Magnet D has the weakest magnetic strength.
(2) Magnet C has the strongest magnetic strength.
(3) Like poles of the magnets are facing each other.
(4) Unlike poles of the magnets are facing each other.

15. Janice wants to make an electromagnet as shown below.



Which of the following will **not** affect the strength of the electromagnet?

A Adding more batteries
B Increasing the length of the wire
C Changing the direction in which the nail faces
D Increasing the number of coils of wire around the iron nail

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

16. Which one of the following statements about light and shadow is **incorrect**?

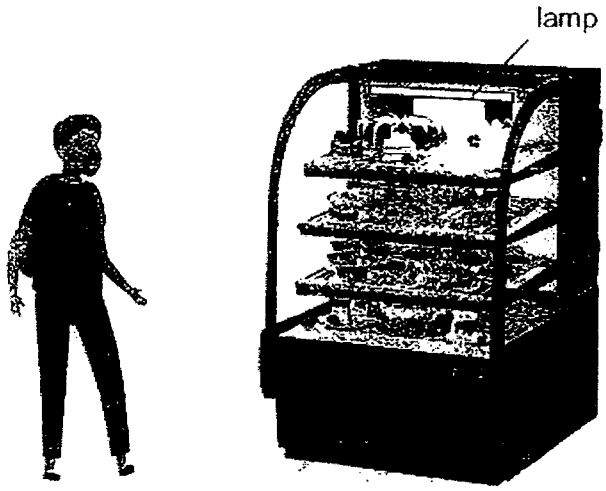
(1) Light is a form of energy.
(2) Only living things can cast a shadow.
(3) A shadow is formed when light cannot pass through an object.
(4) Objects that give off light on their own are natural sources of light.

17. Which one of the following is a source of light?

A fire
B Sun
C moon

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

18. Evan stood in front of a glass display case with pastries as shown below.



He was able to see the pastries under the light in the display case.

Which of the following statements correctly explains why Evan could see the pastries in the display case?

A The cakes gave out light on its own.
B The glass display case allowed light to pass through it.
C The cakes reflected the light from the lamp into Evan's eyes.
D The lamp reflected the light from Evan's eyes onto the cakes.

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

19. There was a blackout one night at home. Damien needed to find his way out of the house to seek help. He could not see a single object in the dark.

Which one of the following statements correctly explains why he cannot see any objects in the dark?

(1) No light falls on any of the objects.
(2) His eyes give off light in the darkness.
(3) The objects absorb light in the darkness.
(4) His eyes cannot reflect light in the darkness.

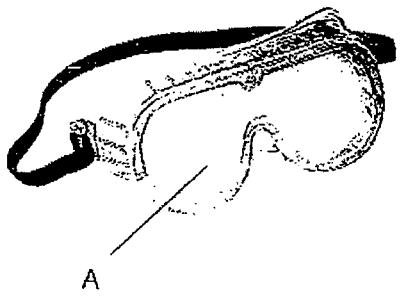
20. Study the classification table.

Objects which allow light to pass through	Objects which do not allow light to pass through
tracing paper X	iron sheet Y

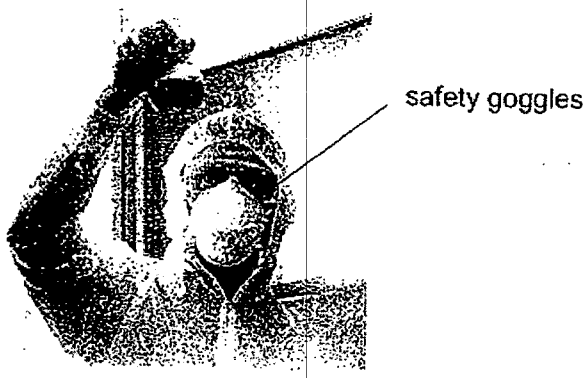
Which object best represent X and Y in the table above?

	X	Y
(1)	cardboard	wooden tray
(2)	wooden cup	cardboard box
(3)	frosted glass	clear plastic bag
(4)	clear plastic bag	mirror

21. A scientist needs to wear a pair of safety goggles to protect his eyes from strong chemicals and prevent eye injuries, while still allowing light to pass through.



safety goggles

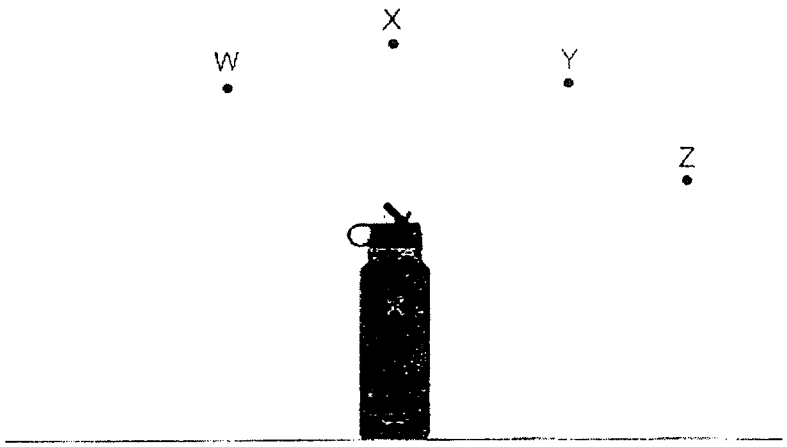


scientist wearing safety goggles at work

Which one of the following materials is most suitable for making part A of the safety goggles?

(1) wood
(2) metal
(3) frosted glass
(4) clear plastic

22. In the diagram below, W, X, Y and Z represent the position of the sun at different times of the day. Halim placed his water bottle under the sun and observed that different lengths of shadows were formed when the position of the sun changes.



Based on the diagram above, which one of the following statements about his observation is correct?

(1) No shadow was formed when the sun was at position X.
(2) The shadow formed when the sun was at position Y was the longest.
(3) The shadow formed when the sun was at position Z was the shortest.
(4) The shadow formed when the sun at position W was longer than at X.

23. Which one of the following properties is true for both air and a chair?

(1) They can be seen.
(2) They occupy space.
(3) They have a definite shape.
(4) They have a definite volume.

24. Study the classification table below carefully.

Matter		
X	Y	Z
pen spoon	milk water	light air

Which one of the following had been classified **wrongly**?

(1) milk
(2) light
(3) water
(4) spoon

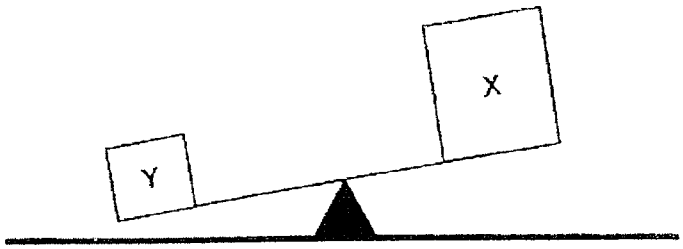
25. Study the table below. The table shows the properties of 3 substances, P, Q and R. A tick (✓) shows that the substance has the property.

	Substance		
Property	**P**	**Q**	**R**
has a definite shape		✓	
can be compressed			✓

Based on the table above, which of the following represents substances, P, Q and R?

	P	Q	R
(1)	oxygen	stone	water
(2)	stone	oxygen	water
(3)	water	stone	oxygen
(4)	water	oxygen	stone

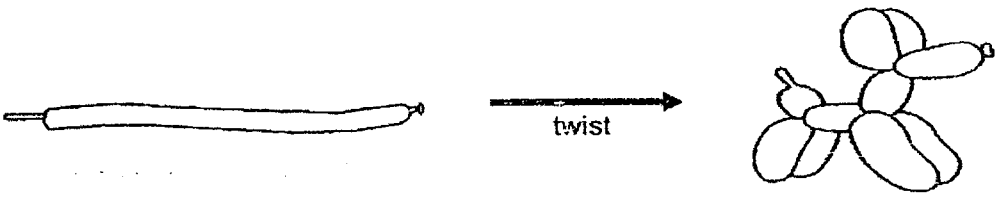
26. Two objects, X and Y, are placed on a lever balance as shown in the diagram below.



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

(1) Object X has less mass than object Y.
(2) Object X has more mass than object Y.
(3) Object X has less volume than object Y.
(4) Object X and object Y have the same volume.

27. Timothy pumped some air with an air pump to inflate a long-shaped balloon. He then twisted the long-shaped balloon to form a 'dog' balloon as shown in the diagram below.



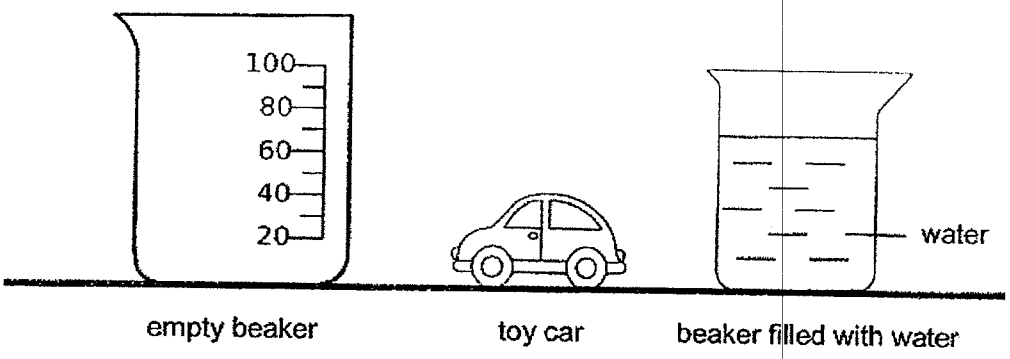
long-shaped balloon filled with air

'dog' balloon

Which one of the following statements correctly explains why Timothy is able to twist the long-shaped balloon and form a 'dog' balloon?

(1) Air does not have mass.
(2) Air has a definite volume.
(3) Air has no definite shape.
(4) Air does not occupy space.

28. Clarissa set up an experiment to find out the volume of her toy car as shown in the diagram below.



She took the following steps to find out the volume of her toy car.

A Lower the toy car gently into the beaker of 40ml of water.
B Read the new volume of water.
C Calculate the difference between the old and new volume of water.
D Fill the empty beaker with 40ml of water.

Which of the following shows the correct sequence of the steps Clarissa took to find out the volume of her toy car?

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

~ END OF BOOKLET A ~

NANYANG PRIMARY SCHOOL

2022
PRIMARY 4
MID-OF-YEAR EXAMINATION

SCIENCE
(BOOKLET B)

Total Time for Booklets A and B: 1 h 45 min

INSTRUCTIONS TO CANDIDATES

1. Write your name and index number in the space provided.
2. Do not open this booklet until you are told to do so.
3. Follow all instructions carefully.
4. Answer all questions.
5. Write your answers to Questions 29 to 40 in the spaces provided.

Booklet A:		**56**
Booklet B:		**44**
Total:		**100**

Name: _____ ( )

Class: Primary 4 ( )

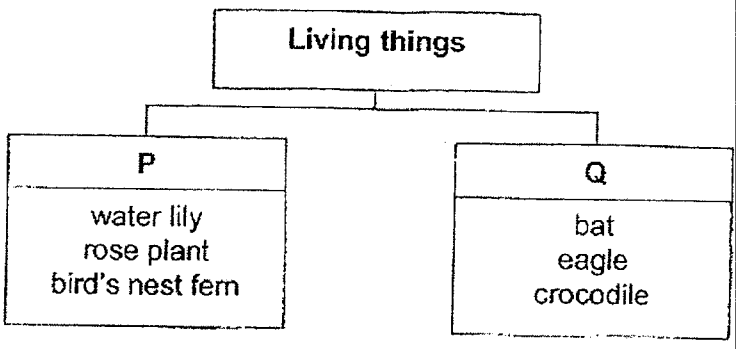
Parent's signature: _____

Please sign and return the paper the next day. Any queries should be raised at the same time when returning the paper.

Booklet B consists of 17 printed pages excluding this cover page.

Section B: Open-Ended Questions [44 marks]

29. Study the classification table below.



(a) Identify a suitable heading for P and Q. [2]

P: _____

Q: _____

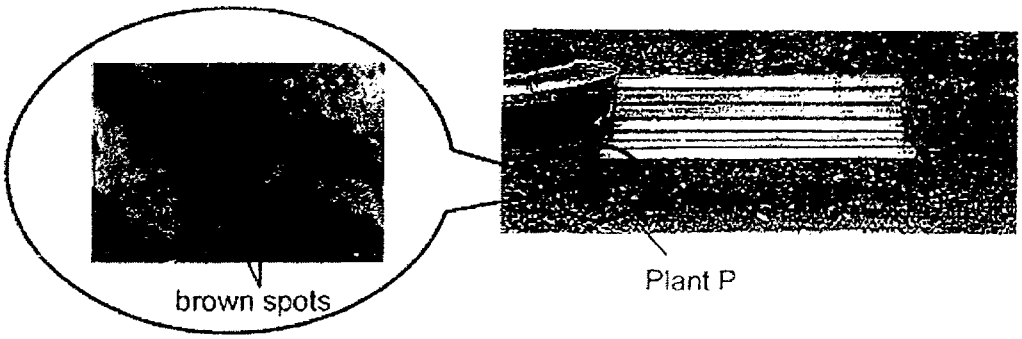
(b) State one characteristic of living things. [1]

_____

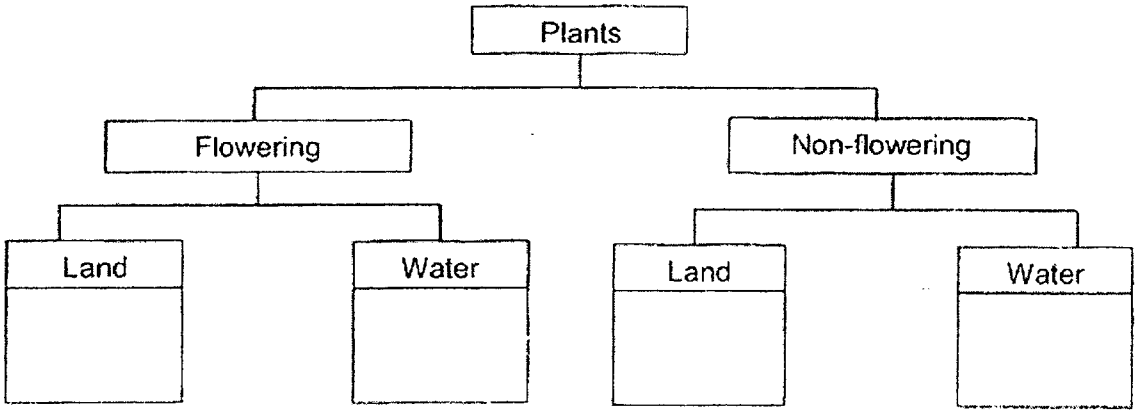
(c) State one difference in characteristics between the living things in P and Q. [1]

_____

30. May Ling was walking in the park and found some Plant P growing next to the bench's legs. She saw brown spots on the underside of the leaves.



Study at the classification diagram below and answer parts (a) and (b).



(a) In the classification table above, classify Plant P in the correct box above by writing "**P**" in the correct box. [1]

May Ling saw another type of plant, Plant Q, in the pond as shown below.

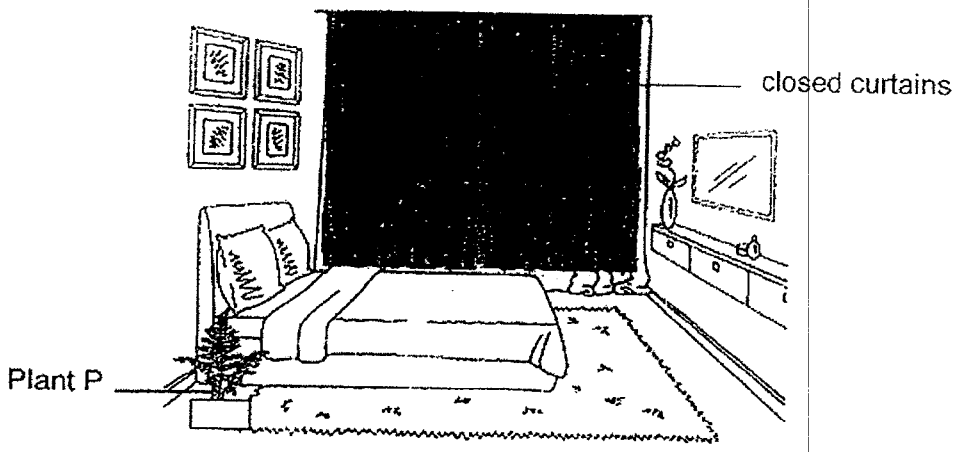
Plant Q

(b) In the classification table above, classify Plant Q in the correct box above by writing "**Q**" in the correct box. [1]

Turn over for next question.

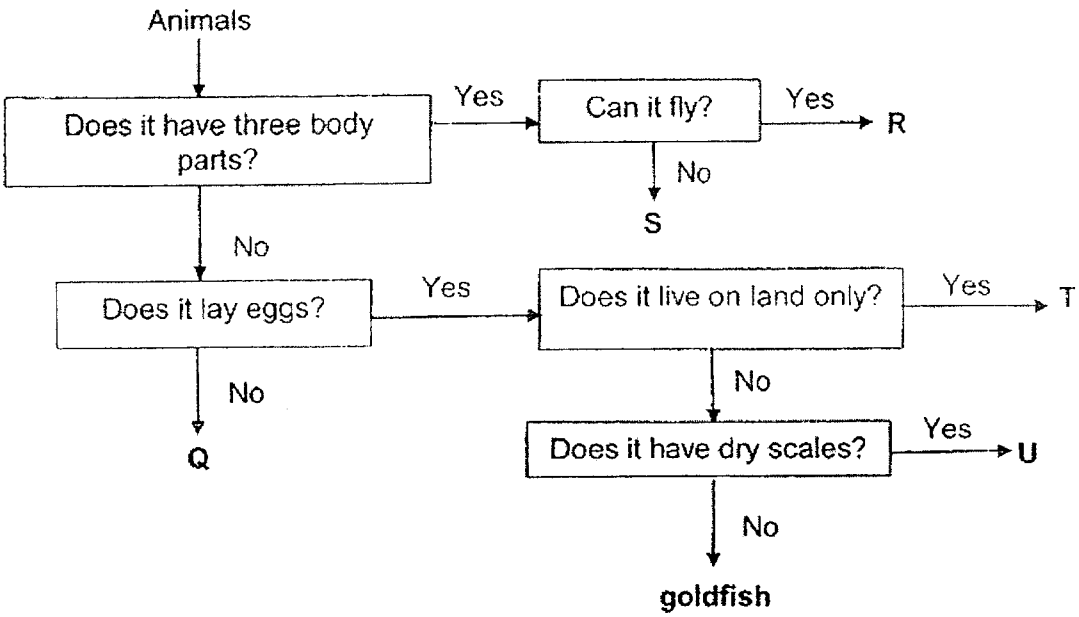
Continue from Q30.

May Ling wanted to grow plant P at home. She placed plant P in her bedroom with her curtains closed at all times. She also watered the plant daily. After a few weeks, she noticed that plant P had died.



(c) Explain why plant P died. [1]

31. Study the flow chart below.



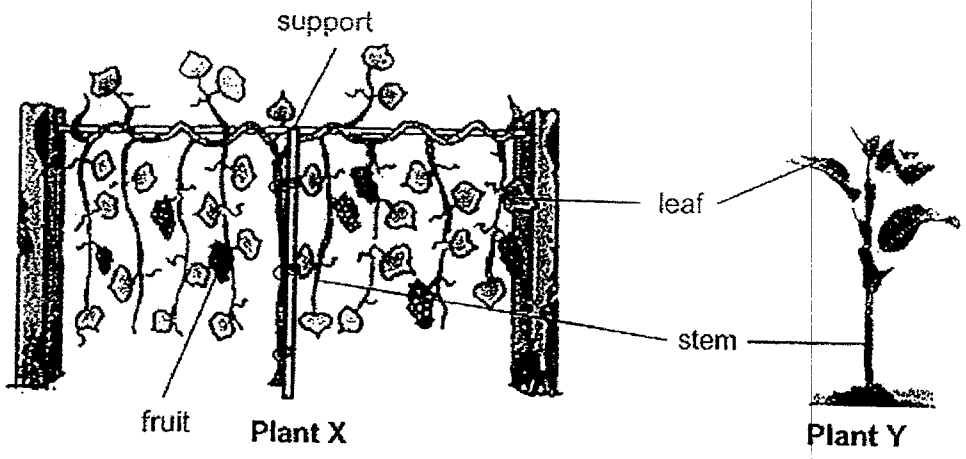
(a) Based on the flow chart above, state all the similarities in characteristics between animals T and U. [1]

(b) Based on the flow chart above, state the difference in characteristics between animals R and S. [1]

(c) Write the letters, **Q**, **R**, **T** and **U** that best represent the animals in the boxes provided. [2]

crocodile	butterfly	parrot	cat

32. The diagram below shows plants X and Y.



(a) State the difference between the stems of plant X and plant Y. [1]

(b) What is the function of the leaves? [1]

(c) Why do the stems of both plants grow upwards? [1]

3

33. The table below shows the different parts of the human digestive system. A tick (✓) shows the function of that part.

	Parts of the human digestive system			
Function	A	B	C	D
Removes water from undigested food	✓			
Digested food is absorbed to the bloodstream				✓
Carries out digestion			✓	✓

(a) Identify the parts A, B, C and D of the digestive system. [2]

A: _____

B: _____

C: _____

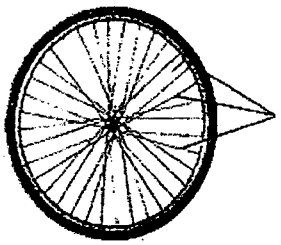
D: _____

At part D, digested food is absorbed into the bloodstream.

(b) Which system does the digestive system work with to transport the digested food to the rest of the body? [1]

_____

The diagram below shows a bicycle wheel. It has metal parts that gives the wheel its shape.



(c) Identify the human organ system that has a similar function as the metal parts of the bicycle wheel. [1]

_____

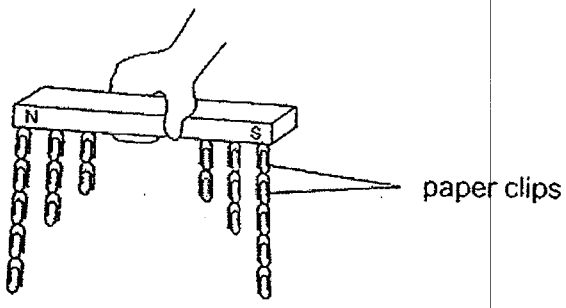
34. May used the stroke method to make an iron bar into a temporary magnet. She then placed the iron bar next to some paper clips and recorded the number of paper clips attracted.

She repeated the experiment with different number of strokes and recorded her results in the table shown below.

Total number of strokes	25	50	100
Number of paper clips attracted to the iron bar	2	8	13

(a) Based on the results above, what is the relationship between the number of strokes and the number of paper clips attracted to the iron bar? [1]

The diagram below show what May observed when the iron bar picked up the paper clips.



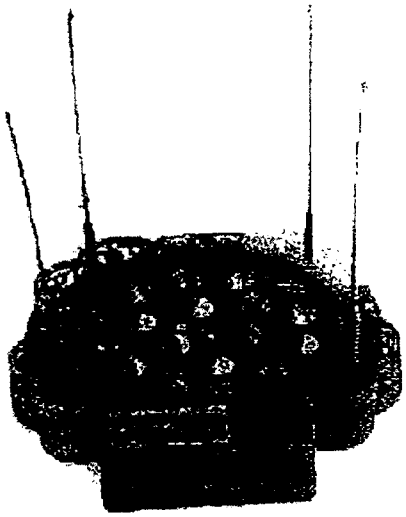
(b) What could May conclude about the poles of the magnetised iron bar from her observation? [1]

Turn over for next question.

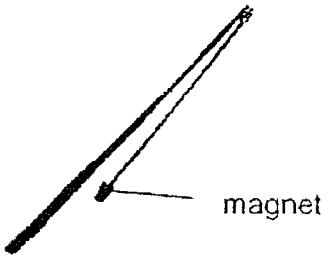
2

Continue from Q34.

May played with a fishing toy using a fishing rod to catch the plastic fishes. She observed that there is a small piece of magnet attached to the end of the fishing rod. There is also a small piece of iron inside each fish's mouth.



fishing toy



fishing rod

fish from the fishing toy

(c) Which property of a magnet enables the fishing toy to work? [1]

After playing with the toy for many months, May noticed that she could not catch any fish anymore as the magnets on her fishing rod had lost its magnetism.

(d) Suggest what could have happened to cause her fishing rod to lose its magnetism. [1]

2

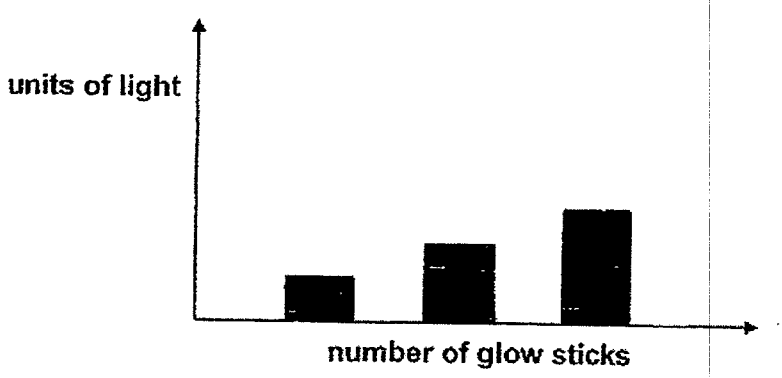
35. Classify the following items under the correct headings in the table below. [2]

(a) lit candle (b) lit torch (c) mirror (d) shadow

Sources of light	Not a source of light

36. Adam placed some glow sticks in a dark room. He used a light sensor to measure the amount of light present.

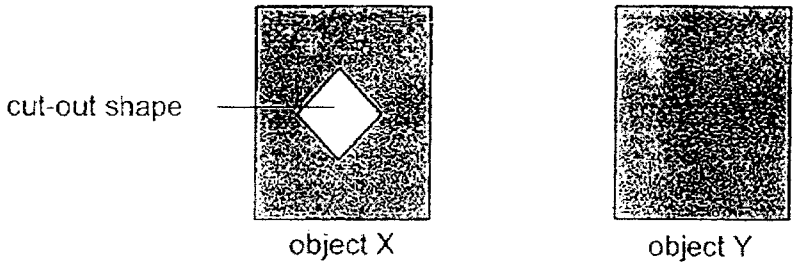
(a) What was the source of light detected by the light sensor? [1]



(b) Describe how he was able to see the glow sticks. [1]

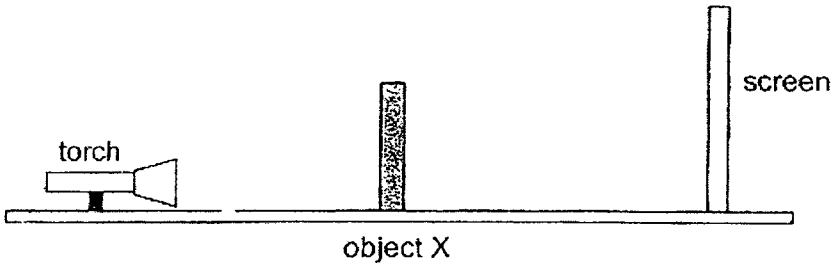
(c) What is the relationship between the number of glow sticks and the units of light given out? [1]

37. Objects X and Y were made from cardboard as shown in the diagrams below. Object Y did not have a cut-out shape. Both objects were of the same size.

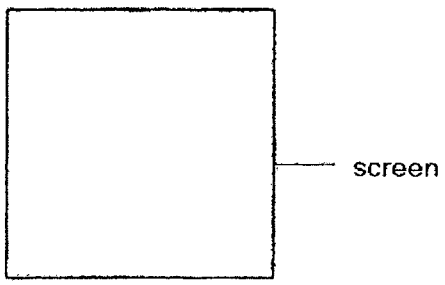


Front view of cardboard sheets

Object X was placed in front of a torch as shown below.



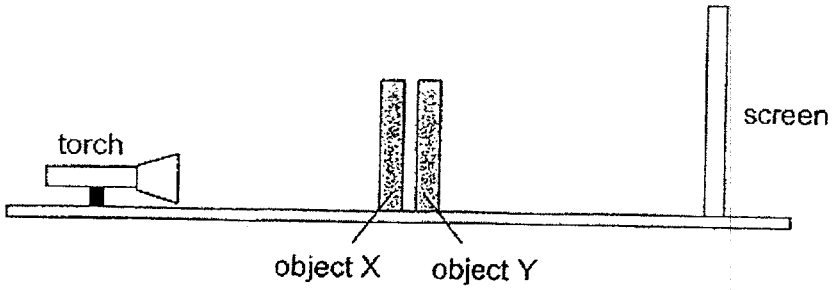
(a) Draw the shadow that will most likely be formed on the screen. [1]



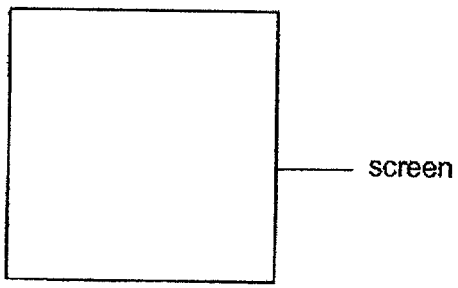
Turn over for next question.

Continue from Q37.

Pei Ling added object Y behind object X as shown in the diagram below.



(b) Draw the shadow that will most likely be formed on the screen when object Y was added. [1]



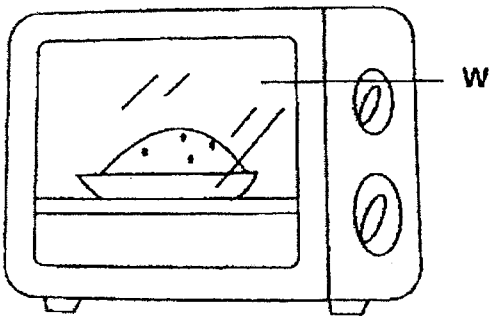
(c) Without changing the position of the torchlight and objects, state one change Pei Ling could do to make the shadows of objects X and Y appear smaller. [1]

Turn over for next question.

Continue from Q37.

Pei Ling conducted an experiment and collected some results on the amount of light passing through different materials. She recorded her results in the table shown below.

Materials	Amount of light passing through each material (lux)
A	225
B	736
C	0



microwave

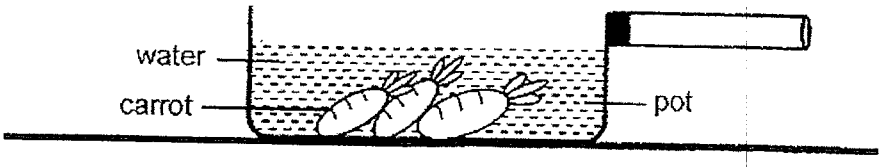
Part W of the microwave door should enable the user to see the inside of the microwave clearly.

Pei Ling thinks that Material C should be chosen to make part W.

(d) Explain if Pei Ling's choice is correct. [2]

2

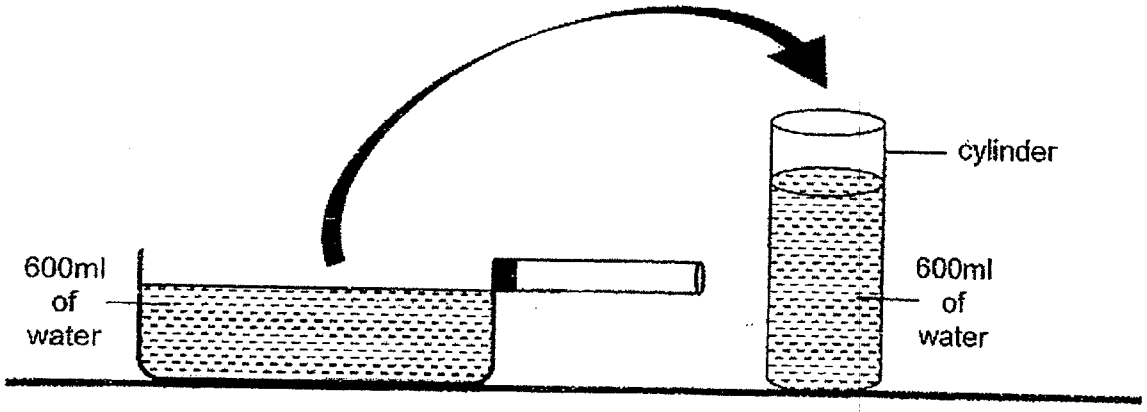
38. Priya set up a pot of water with some carrots in it as shown in the diagram below.



(a) Identify the state of matter for the following objects. [1]

Object	State of Matter
(i) carrot	
(ii) water	

After removing the carrots, Priya then poured all the water from the pot into a cylinder without spilling as shown in the diagram below.



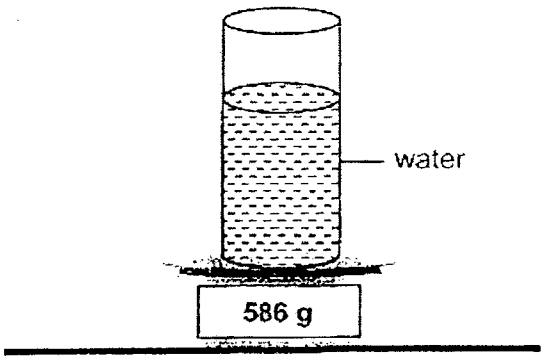
(b) Based on the observation above, state the property of water that is shown. [1]

Turn over for next question.

2

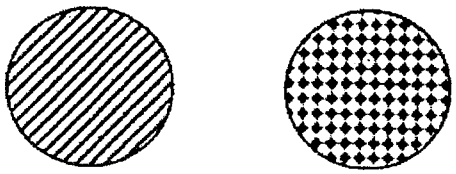
Continue from Q38.

Priya then measured the mass of the cylinder of water on an electronic balance as shown in the diagram below.



(c) Will the mass of the water in the cylinder be 586g or less than 586g? Explain your answer. [1]

39. Fandy had 2 similar stones, M and N, of the same size and shape as shown in the diagram below. However, stones M and N are made of different materials. He measured the volume of stone M and found out that stone M had a volume of 18cm³.



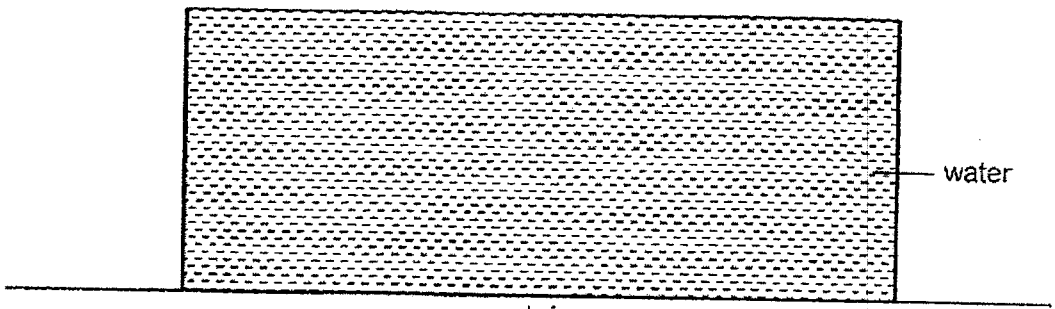
stone M stone N

(a)(i) State the volume of stone N. [1]

_____ cm³

(ii) Explain your answer. [1]

Fandy then set up a container completely filled with water to its maximum as shown in the diagram below. He placed both stones, M and N, carefully into the container.



container
(completely filled with water)

(b)(i) What will happen to the water after both stones, M and N, were placed into the container of water? [1]

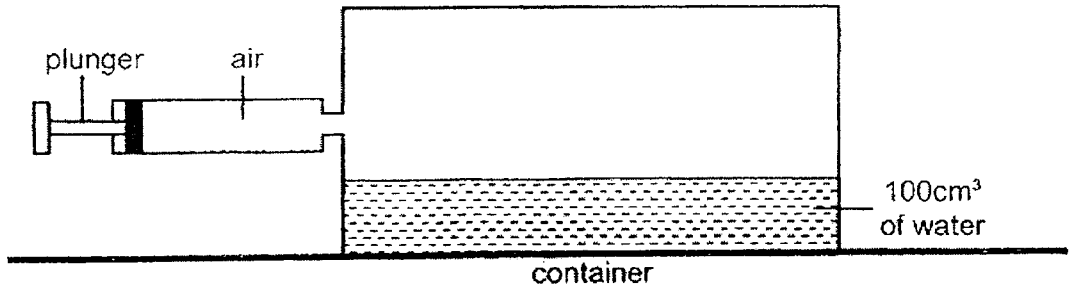
(ii) Explain your answer above. [1]

4

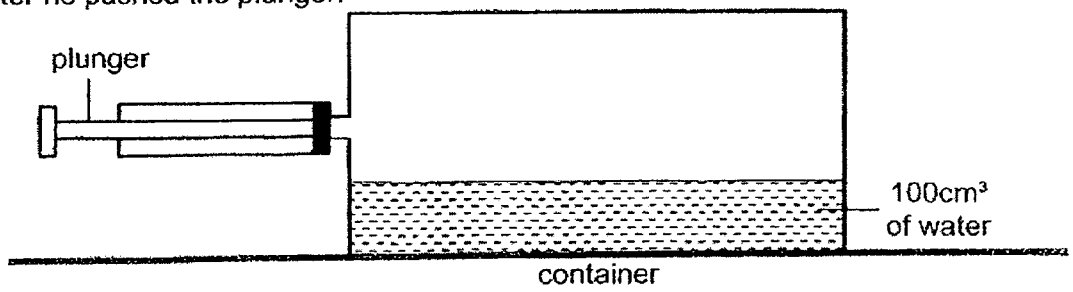
40. Patrick set up an experiment as shown below. He prepared an empty container with a volume of 300cm³. He filled the container with 100cm³ of water. He then connected an air pump to the container. Each push of the plunger pumps 50cm³ of air into the container.

Patrick then pushed the plunger once.

Before he pushed the plunger:



After he pushed the plunger:



(a) In the table below, state the volume of air in the container before and after he pushed the plunger once. [2]

	Volume of air in the container (cm³)
(i) Before he pushed the plunger once	
(ii) After he pushed the plunger once	

(b) Based on the results of his experiment above, state the property of air that is shown. [1]

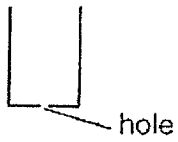
_____

_____

Turn over for next question.

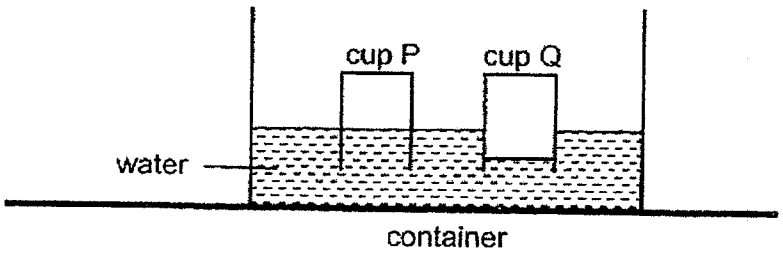
Continue from Q40.

Patrick set up another experiment with 2 identical plastic cups, P and Q. Only one of the cups had a hole at the bottom as shown in the diagram below.



cup with a hole at the bottom

He inverted both cups and placed them into a container of water. His observations are shown in the diagram below.

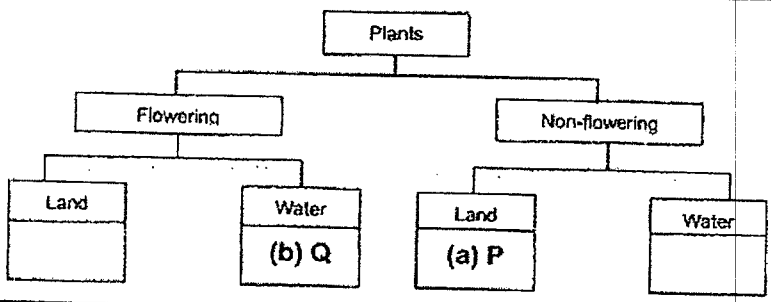


(b) Based on the results above, which cup, P or Q, most likely had a hole at the bottom? Explain your answer. [2]

Nanyang Primary School
P4 SCIENCE MYE 2022
Suggested Answers
Section A

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

Section B

Qn No	Suggested Answers
29a.	P: **Plants** Q: **Animals**
29b.	**Living things can reproduce.** (including other characteristics of living things)
29c.	**Living things in P can make their own food but living things in Q cannot make their own food.**
30a. 30b.	
30c.	**Plant P did not have enough sunlight to make food.**
31a.	**Both lay eggs and do not have three body parts.**
31b.	**R can fly but S cannot fly.**
31c.	crocodile: **U**; butterfly: **R**; parrot: **T**; cat: **Q**
32a.	**Plant X needs a support for the stem but Plant Y does not need a support.**
32b.	**Leaves make food for the plant.**
32c.	**To bring the leaves higher to trap more sunlight.**

<table>
<tr><td>33a.</td><td>A: large intestine C: stomach
B: gullet D: small intestine</td></tr>
<tr><td>33b.</td><td>Circulatory system</td></tr>
<tr><td>33c.</td><td>Skeletal system</td></tr>
<tr><td>34a.</td><td>As the number of strokes increases, the number of paper clips attracted to the magnet increases.</td></tr>
<tr><td>34b.</td><td>The magnetic strength of a magnet is strongest at its poles.</td></tr>
<tr><td>34c.</td><td>Magnet attracts magnetic materials.</td></tr>
<tr><td>34d.</td><td>The fishing rod had been dropped several times.</td></tr>
<tr><td>35.</td><td><table><tr><th>Sources of light</th><th>Not a source of light</th></tr><tr><td>Lit candle
Lit torch</td><td>Mirror
Shadow</td></tr></table></td></tr>
<tr><td>36a.</td><td>Glow sticks</td></tr>
<tr><td>36b.</td><td>The glow sticks gave out light and the light entered his eyes.</td></tr>
<tr><td>36c.</td><td>The more the number of glow sticks, the more the units of light given out.</td></tr>
<tr><td>37a.</td><td>  </td></tr>
<tr><td>37b.</td><td>  </td></tr>
<tr><td>37c.</td><td>She can move the screen closer to the objects.</td></tr>
<tr><td>37d.</td><td>Her choice is wrong. Part W should allow most light to pass through it but Material C does not allow light to pass through it.</td></tr>
<tr><td>38ai.
38aii.</td><td><table><tr><th>Object</th><th>State of Matter</th></tr><tr><td>(i) carrot</td><td>Solid</td></tr><tr><td>(ii) water</td><td>Liquid</td></tr></table></td></tr>
<tr><td>38b.</td><td>Water has no definite shape.</td></tr>
<tr><td>38c.</td><td>Less than 586g. The cylinder also has mass.</td></tr>
<tr><td>39ai.</td><td>The volume of stone N is 18cm^3.</td></tr>
<tr><td>39aii.</td><td>Stones M and N occupy the same amount of space.</td></tr>
<tr><td>39bi.</td><td>The water in the container will overflow.</td></tr>
<tr><td>39bii.</td><td>Stones, M and N, occupy the space in the container previously occupied by the water.</td></tr>
<tr><td>40ai.</td><td>200cm^3</td></tr>
<tr><td>40aii.</td><td>200cm^3</td></tr>
<tr><td>40b.</td><td>Air can be compressed.</td></tr>
<tr><td>40c.</td><td>Cup P. The water level in cup P is the same as the water level in the container of water. The air in cup P escaped through the hole, allowing water to occupy the space previously occupied by the air.</td></tr>
</table>