NANYANG PRIMARY SCHOOL

2024
PRIMARY 6
PRELIMINARY 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 6 ( )

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

Section A: Multiple Choice Questions [56 marks]

1. Which of the following describe(s) both the field habitat and the garden habitat correctly?

   A Both habitats can have some common animal populations living in them.
   B The plants in both habitats provide food and shelter for some of the animals living there.
   C Flowering plants can only be found in the garden habitat while non-flowering plants can only be found in the field habitat.

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

2. Nora saw bird X in a garden. Thirty minutes later, she concluded that bird X forms a population in the garden community.

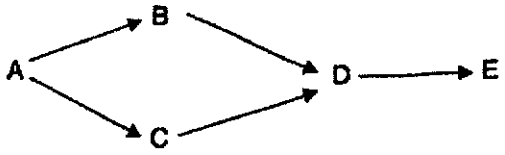
   Which of the following observations allowed her to make the conclusion?

   A Bird X eating earthworms
   B Bird X feeding two of its young
   C Bird X preyed on by its predator
   D Bird X building its nest with its mate

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

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

3.



Which of the following statements about the food web is **false**?

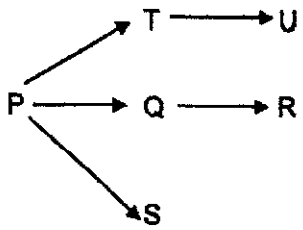
(1) Energy in organism E is transferred to organism D.
(2) Energy in organism B cannot be transferred to organism C.
(3) Energy in organism A is indirectly transferred to organism D.
(4) Organisms A, B, C, D and E belong to the same community.

4. Which of the following changes in population size could be observed after an increase in organism E's population size?

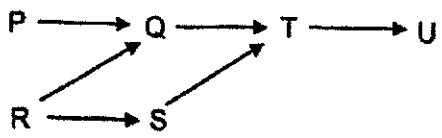
(1) Increase in organism A's population size
(2) Increase in organism B's population size
(3) Increase in organism D's population size
(4) Decrease in organism C's population size

5. Which of the food webs below shows three populations of predators?

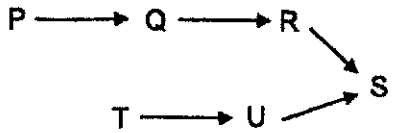
(1)



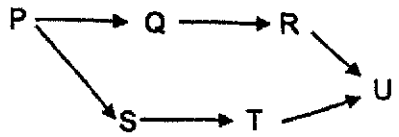
(2)



(3)



(4)



6. Which of the following examples of adaptations had been grouped correctly?

	Structural	Behavioural
(1)	sharp claws	small and light body
(2)	long tail fins	webbed feet
(3)	body patterns	producing distinct sounds
(4)	hunting in groups	using venom to kill prey

7. Which of the following adaptations of plants is correctly matched with its purpose?

	Adaptation	Purpose
(1)	Needle-like leaves of a cactus	To store water for the plant
(2)	Male reproductive parts that hang out of a flower	To trap pollen in the air easily
(3)	Spongy leaf stalks filled with air	To allow the plant to float on water
(4)	Fruits of a plant that are brightly-coloured	To attract pollinators

8. Which of the following describes adaptations of animals that prevent their predators from spotting them?

A Changing body colour to green when on a green leaf
B Changing fur colour from brown to white during snowy winter
C A non-poisonous animal having the appearance of a poisonous animal
D Having body shapes and colour that look like branches on the plant that they live on

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

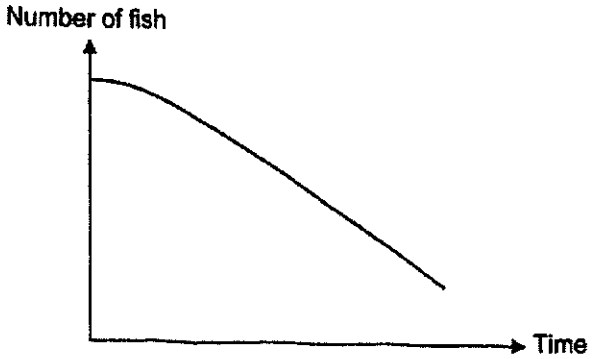
9. Which of the following is/are way(s) that help to conserve natural resources?

A Use more paper bags instead of plastic bags
B Using public transport instead of private vehicles
C Clear forests by burning trees to make the soil fertile
D Recycle used materials and make them into new products

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

10. The diagram below shows a river. The arrow indicates the flow of river water.

The graph below shows the number of fish over time at part Y of the river.

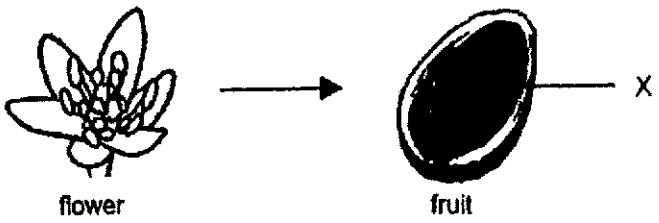


Which of the following could have happened at part X of the river bank to cause the change in the number of fish?

A Picking up litter
B Planting more trees
C Discharge of factory waste into the river
D Spraying of pesticides regularly on plants growing by the river

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

11. The diagram below shows a flower that has developed into a fruit. Part X can germinate into a new plant.

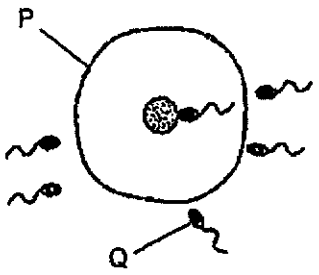


Which statement(s) is/are correct?

A Pollination had taken place.
B Part X developed from an ovule.
C The flower has many ovules in the ovary.

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

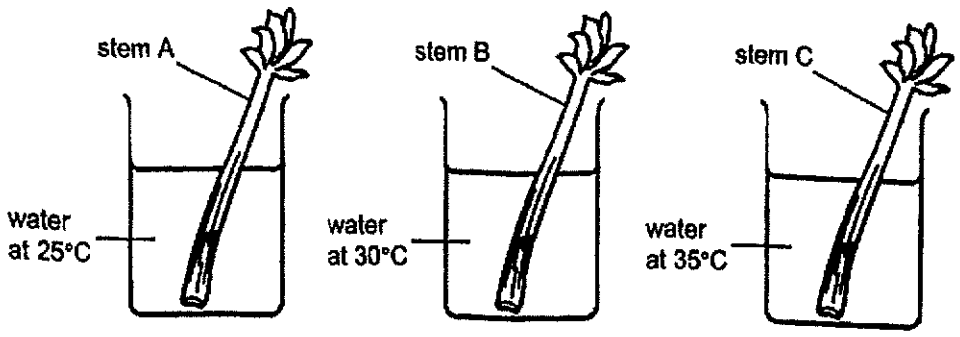
12. The diagram below shows cells P and Q during process H in the reproduction of an animal.



Which one of the following correctly identifies cell P, cell Q and process H?

	Cell P	Cell Q	Process H
(1)	egg	sperm	fertilisation
(2)	egg	sperm	pollination
(3)	sperm	egg	fertilisation
(4)	sperm	egg	pollination

13. Amy wanted to find out how the temperature of water affects the rate of movement of water in stems. She used three similar pieces of stem and three identical beakers with the same volume of water. She recorded the volume of water left in the beakers after 3 hours.

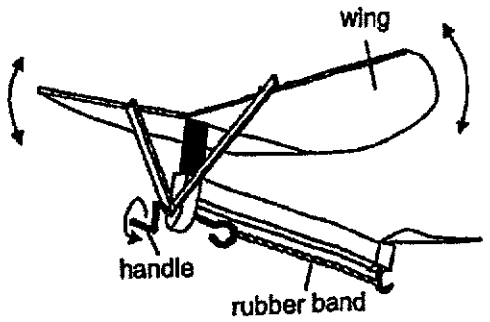


Which one of the following variables should be kept constant in her experiment?

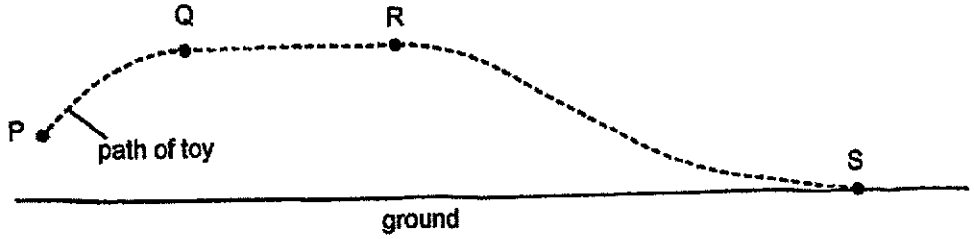
(1) length of stem
(2) temperature of water
(3) volume of water transported up each piece of stem
(4) time taken for the water to reach the top of the stem

Read the information below and use it to answer questions 14 and 15.

Tom has a toy shown below. When he turns the handle, the rubber band becomes twisted. The wings move up and down loudly when the handle is released.



Tom turned the handle 40 times and threw the toy in the air at point P. The toy flew from P to Q, then flew at the same height from Q to R before stopping at S as shown below.



14. Which one of the following correctly shows the main energy changes in the toy when it is released at point P and it flew to point Q?

	Before release at P	From P to Q
(1)	kinetic energy →	kinetic energy + sound energy
(2)	kinetic energy →	kinetic energy + potential energy + sound energy
(3)	potential energy →	kinetic energy + sound energy
(4)	potential energy →	kinetic energy + potential energy + sound energy

15. Which of the following explains why the toy flew lower from R to S?

A Gravitational force acts on the toy only from R to S.
B There is less kinetic energy in the toy than before.
C There is less potential energy in the rubber band than before.

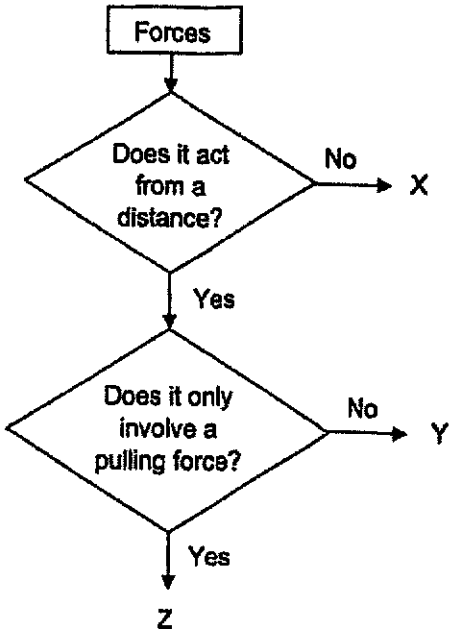
(1) A only
(2) A and B only
(3) B and C only
(4) A, B and C

16. Which of the following organ systems are involved when we walk and run?

A Skeletal system
B Respiratory system
C Circulatory system
D Muscular system

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

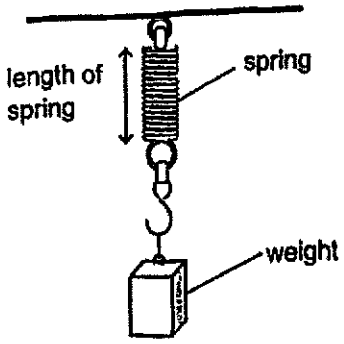
17. Study the flowchart below carefully.



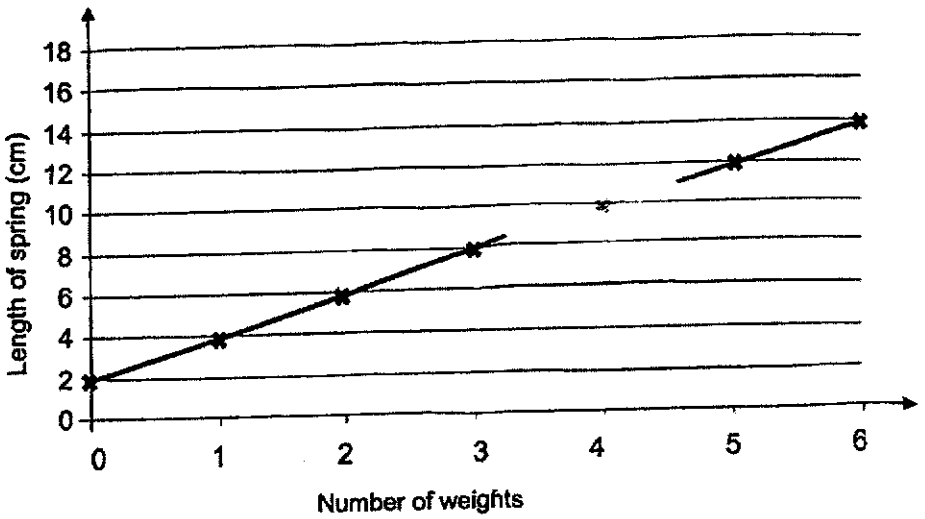
Which of the following correctly represents, X, Y and Z?

	X	Y	Z
(1)	frictional force	elastic spring force	gravitational force
(2)	magnetic force	frictional force	elastic spring force
(3)	elastic spring force	magnetic force	frictional force
(4)	frictional force	magnetic force	gravitational force

18. Emma set up an experiment as shown in the diagram below.



She hung different number of weights on the spring and measured the length of the spring. Then, she plotted a graph below to show the results.

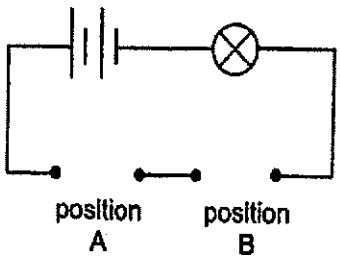


Using her results, she calculated the extension of the spring.
Extension = New length of spring - original length of spring.

If the extension of the spring is 4 cm, how many weights did she use?

(1) 1
(2) 2
(3) 3
(4) 0

19. Jeremy set up a circuit as shown in the diagram below.



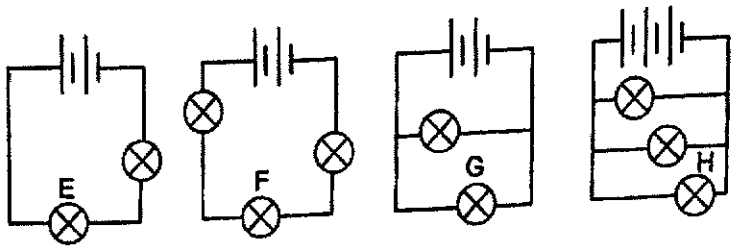
He placed different objects, J, K, L and M at positions A and B to connect the circuit and recorded if the bulb lights up in the table below.

Position where the object was placed		Did the bulb light up?
A	B	
J	K	No
J	L	Yes
L	M	Yes

Which of the following are likely the materials that objects J, K, L and M are made of?

	J	K	L	M
(1)	steel	rubber	iron	aluminium
(2)	wood	iron	rubber	steel
(3)	iron	aluminium	steel	rubber
(4)	rubber	wood	aluminium	steel

20. Kai set up the following circuits using similar bulbs and batteries as shown in the diagram below. All the bulbs and batteries are in good working condition.



He arranged the bulbs from dimmest to brightest.
Which of the following has been arranged correctly?

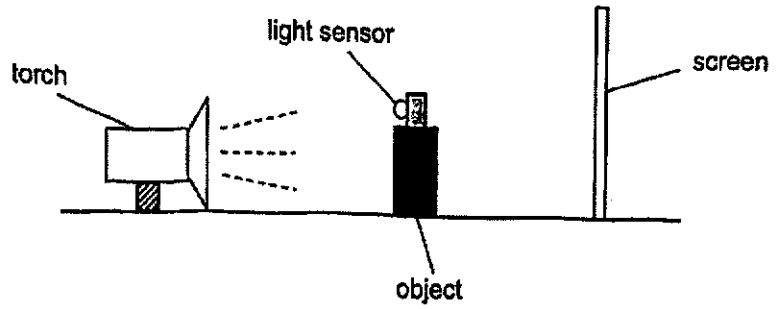
	Brightness of bulb (Dimmest ➡ Brightest)
(1)	H, G, E, F
(2)	F, E, G, H
(3)	E, G, F, H
(4)	G, H, F, E

21. Which actions below help to conserve electricity?

A Use the fan instead of air-conditioner.
B Switch off the lights when leaving the room.
C Shower without the water heater on a hot day
D Use the half flush instead of full flush for liquid waste.

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

22. Manfred conducted an experiment using the set-up consisting of a torch, an object, a screen and a light sensor, as shown in the diagram below.



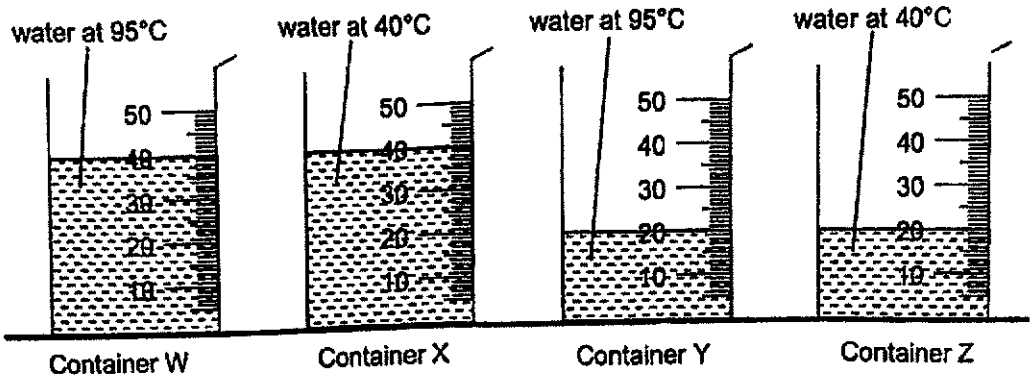
He attached the light sensor on top of the object to measure the amount of light received. Then, he repeatedly moved the position of only one item in the set-up before recording the light sensor readings in the table below.

	Height of shadow (cm)	**Light sensor reading (units)**
First reading	100	40
Second reading	125	40
Third reading	140	40
Fourth reading	165	40

What change did Manfred make?

(1) He moved the torch nearer to the object.
(2) He moved the screen nearer to the object.
(3) He moved the object further away from the screen.
(4) He moved the screen further away from the object.

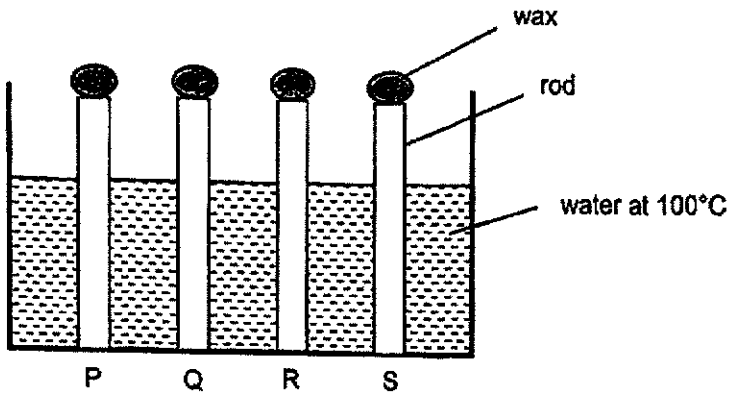
23. Kit filled four identical containers, W, X, Y and Z, with water as shown in the diagram below.



Which containers of water have the least and most amount of heat?

	Least amount of heat	Most amount of heat
(1)	Z	Y
(2)	X	Z
(3)	Z	W
(4)	Y	X

24. Chloe set up an experiment using four similar-sized rods made of different materials, P, Q, R and S. She placed the same amount of wax on top of each rod and lowered each rod into a container. Then, she poured water into the container as shown in the diagram below.



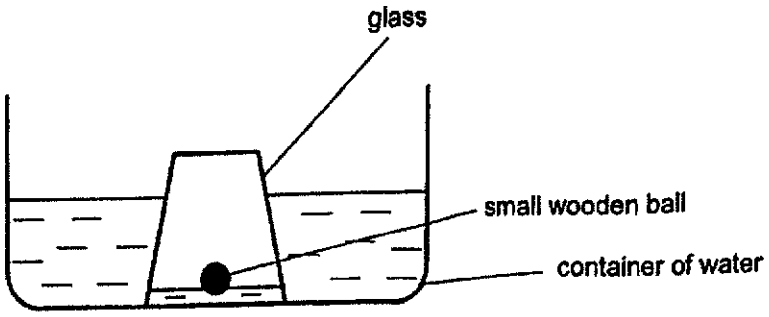
Chloe recorded the time taken for all the wax on rods P, Q, R and S, to melt in the table below.

Materials	Time taken for the wax to melt (minutes)
P	5
Q	3
R	6
S	7

Which material, P, Q, R or S, should Chloe use to make a box to store ice cubes so that the ice cubes will melt the slowest?

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

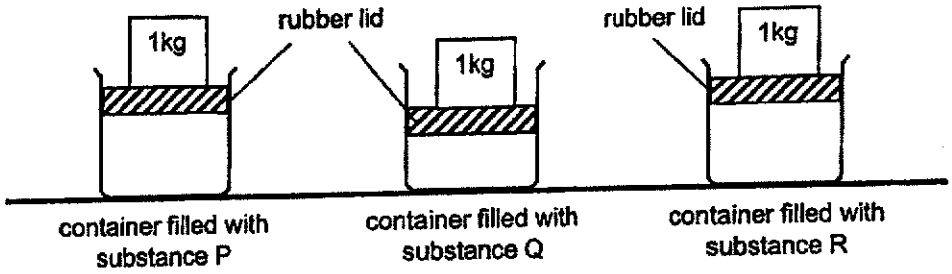
25. Ray lowered an empty glass with a small wooden ball into a container of water until it touched the bottom of the container. The small wooden ball floated as shown in the diagram below.



Which one of the following statements correctly explains the difference in the water level inside and outside the glass?

(1) The air trapped in the glass occupied space.
(2) The small wooden ball in the glass occupied space.
(3) The air trapped in the glass does not have a fixed shape.
(4) The small wooden ball pushed the water out from the glass.

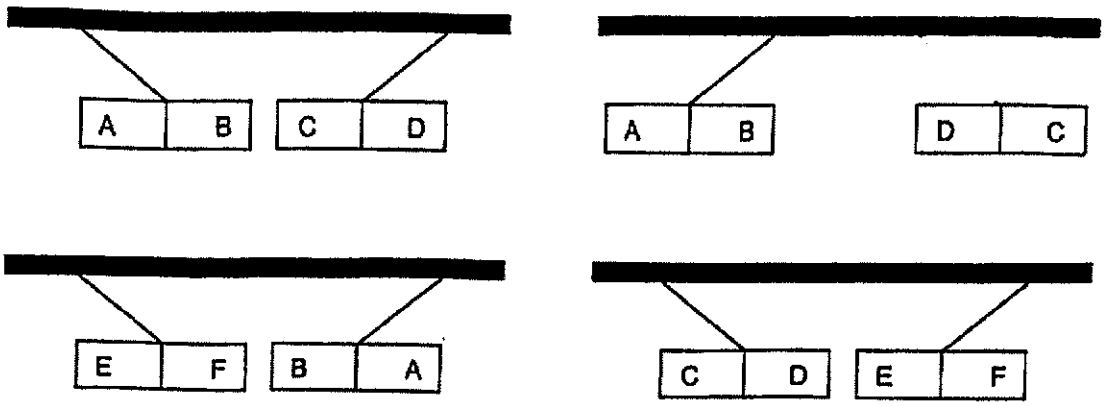
26. Three identical metal containers were each filled with substances P, Q and R respectively. A rubber lid was placed at the opening of the three containers. A 1 kg weight was then placed on the rubber lid of each container. Only the rubber lid on the container filled with substance Q moved downwards, as shown in the diagram below.



Which of the following statements correctly explained this observation?

(1) Substances P, Q and R are liquids.
(2) Substance Q has no definite volume.
(3) Substance R is a gas and can be compressed.
(4) Substance P is a solid and Q and R are both gases.

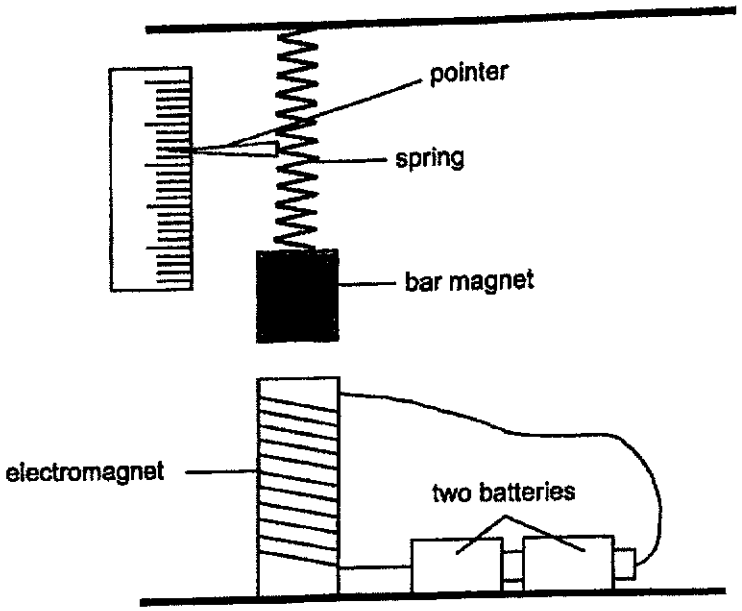
27. Ali wanted to find out which of the three metal bars, AB, CD and EF, are magnets. He hung each bar from a string and brought them near to each other before releasing them. His results are shown below.



Which of the following is correct?

	AB	CD	EF
(1)	magnetic object	magnetic object	magnet
(2)	magnet	magnetic object	magnet
(3)	magnet	magnet	magnetic object
(4)	magnet	magnet	magnet

28. The diagram below shows a bar magnet repelled by an electromagnet when two batteries are used. A pointer attached to the spring moves when the spring stretches or compresses.



Which one of the following is correct when only one battery is used?

	movement of pointer	strength of electromagnet
(1)	upwards	increased
(2)	upwards	decreased
(3)	downwards	increased
(4)	downwards	decreased

~ End of Section A ~

NANYANG PRIMARY SCHOOL

2024
PRIMARY 6
PRELIMINARY 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 6 ( )

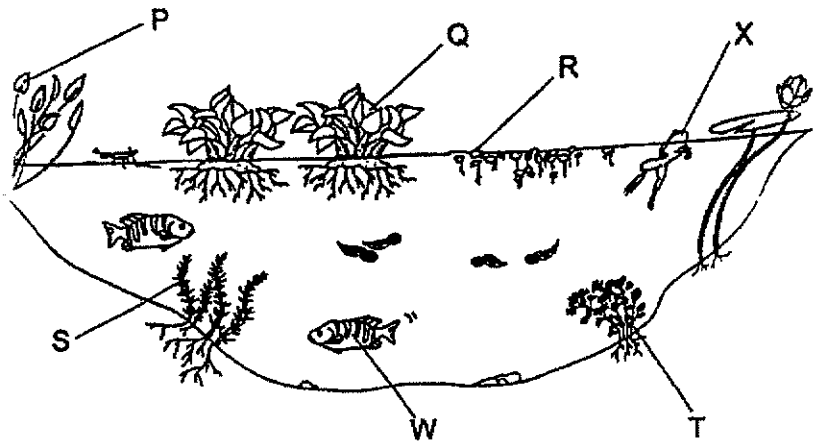
Parent's signature: _____

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 15 printed pages excluding this cover page.

Section B: Open-Ended Questions (44 marks)

29. The diagram below shows a pond habitat.



Animals W and X lay eggs among the stems of plant S.

(a) State one advantage of laying eggs among the stems. [1]

_____

_____

During periods of hot weather, the population of plant R increases at a faster rate and they cover the entire surface of the pond.

(b) Explain why plant S is more affected than plant Q when the population of plant R increased. [2]

_____

_____

_____

3

(Continue from Q29)

Animal X has moist skin while animal W has scales.

(c)(i) Identify the animal groups that X and W belong to. [1]

X: _____

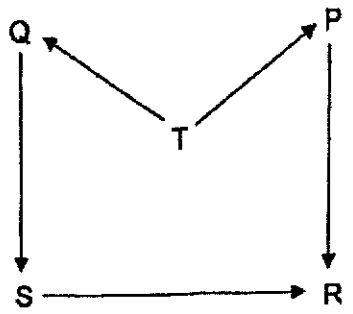
W: _____

(c)(ii) Based on the animal groups in (c)(i), give a reason why animal X is less affected than animal W after plants S and T are removed. [1]

_____

_____

30. The food web below shows the relationships between organisms P, Q, R, S and T.



(a) Classify organisms P, Q, R, S and T under the correct headings in the table below. [2]

Producer	Plant-eater	Animal-eater

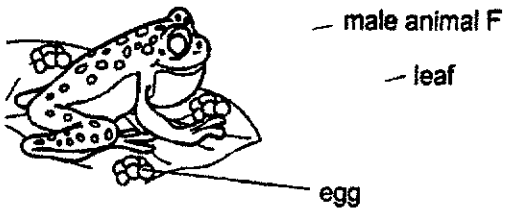
There was a sudden decrease in the population of organism R even though the population of the other organisms remained the same.

(b) Give a possible reason for this decrease. [1]

_____

_____

31. Female animal F lays its eggs on green leaves. Male animal F will guard the eggs after they are laid. Male animal F has spots on its body that look like its eggs and has strong muscular legs. It was also observed that insect W feeds on the eggs of animal F



(a) Explain how the spots on animal F's body and muscular legs increases the number of eggs hatching into young. [2]

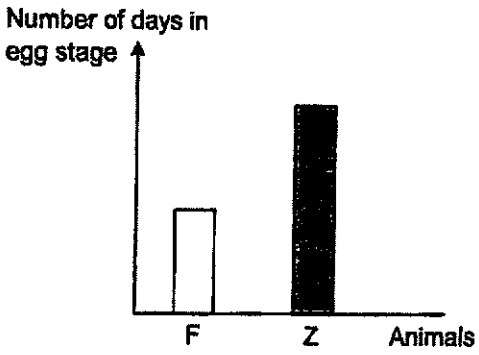
_____

_____

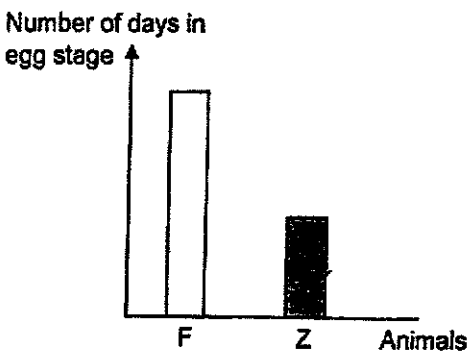
_____

It was observed that another insect Z lays its eggs among animal F's eggs. The larvae of insect Z feeds on the unhatched eggs of animal F.
Study graph P and graph Q below.

Graph P



Graph Q



(b) Which graph, P or Q, correctly shows the duration of the egg stages of animals F and Z such that the larvae of Z has more food. Explain your answer. [2]

_____

_____

_____

4

32. Tom set up an experiment using three similar leaves, P, Q and R, on the same plant. These leaves have tiny openings on both their upper and lower surfaces. Leaves lose water as water vapour through these tiny openings.

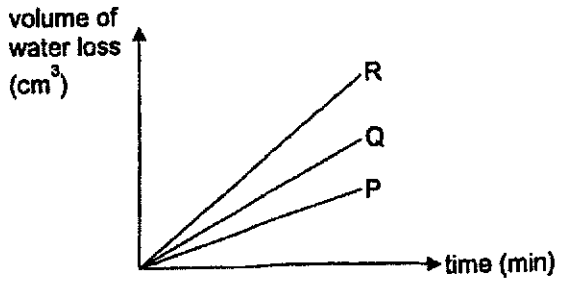
(a) Other than for losing water, state another function of the tiny openings on a leaf. [1]

_____

He coated some surfaces of the leaves with oil as shown in the table below.

Leaf	Coated with oil	
	Upper surface	Lower surface
P	yes	no
Q	no	yes
R	no	no

The plant was placed under bright sunlight for two hours. Tom measured the volume of water loss at regular time intervals. His results are shown in the graph below.



Tom concluded that there are more tiny openings on the upper surface than the lower surface of the leaves of this plant.

(b) With reference to the data in the graph and table, explain how he arrived at this conclusion. [2]

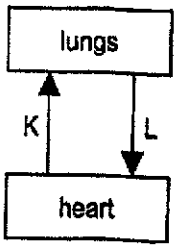
_____

_____

_____

3

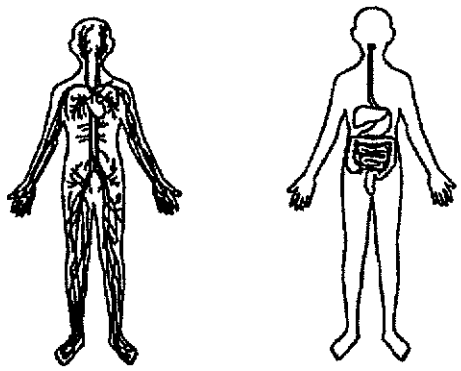
33. Study the diagram below.



(a) Identify a gas which is at a higher amount in the blood at K than L. [1]

(b) Other than the part given in the diagram, state all the other part(s) of the circulatory system. [1]

34. Study the diagrams below.



circulatory system digestive system

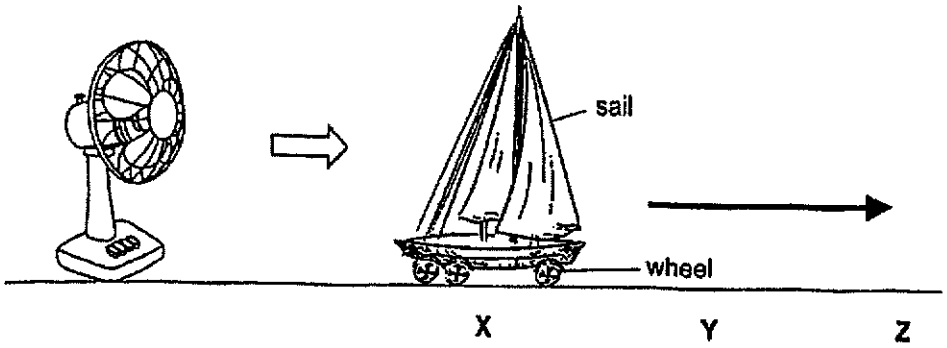
(a) Describe how the circulatory system works together with the digestive system. [2]

John accidentally swallowed a piece of meat without chewing.

(b) Explain why it would take a longer time for his body to digest the meat. [1]

3

35. The diagram below shows a toy boat with a sail. When Ben turned on the fan at the lowest speed, the wind from the fan caused the toy boat to move forward from point X to point Y.



At point Y, the fan was switched off, but the toy boat continued to move forward before stopping at point Z.

(a) State the **source** of energy present that caused the toy boat to move. [1]

_____

(bi) **In terms of energy**, give a reason why the toy boat continued to move forward from point Y to point Z. [1]

_____

_____

(bii) **In terms of energy**, explain why the toy boat stopped moving at point Z. [1]

_____

_____

(c) Using the same equipment in the setup, suggest one way to make the toy boat move a longer distance. Give a reason for your answer **in terms of energy**. [2]

Suggestion: _____

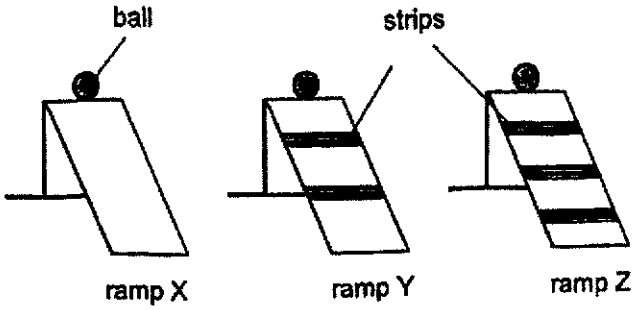
_____

Reason: _____

_____

5

36. Trisha conducted an experiment with three similar ramps X, Y and Z as shown in the diagram below.



She placed different numbers of strips of the same length and thickness across ramps Y and Z. She released a ball from the top of the ramp and recorded the time taken for the ball to reach the bottom of the ramp.

She repeated the experiment with ramps Y and Z. The readings are recorded in the table below.

	Time taken for the ball to reach the bottom of the ramp (seconds)
Ramp X	2
Ramp Y	5
Ramp Z	8

(a) What is the relationship between the number of strips and the time taken for the ball to reach the bottom of the ramp? [1]

_____

_____

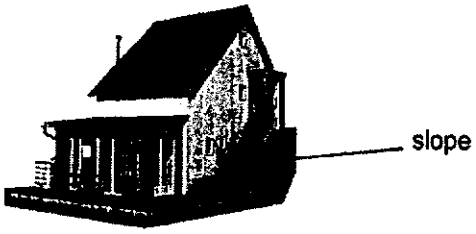
(b) Identify the two forces acting on the ball as it rolls down the ramp. [1]

_____

2

(Continue from Q36)

The diagram below shows a slope at the side of Trisha's house.



(c) Based on the results above, give a reason **in terms of forces**, how placing more strips on the slope will prevent Trisha from slipping on a rainy day. [1]

_____

_____

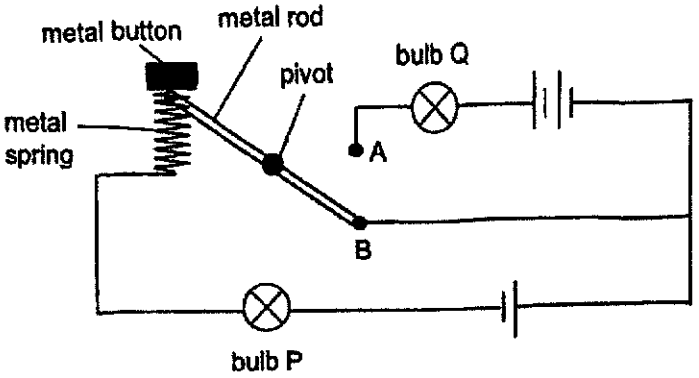
(d) How can Trisha increase the reliability of the results of her experiment? [1]

_____

_____

2

37. Mdm Tan set up a circuit using two identical bulbs, P and Q, and three identical batteries as shown in the diagram below. All the bulbs and batteries are in good working conditions. The metal rod can swing freely about the pivot.



The diagram above shows the metal rod touching point B.

(a) Put a tick in the box below to indicate the expected observation. [1]

	Did the bulb light up?	
	Yes	No
Bulb P		
Bulb Q		

When Mdm Tan pressed the button down, the metal spring will be compressed and the metal rod will move up and touch point A.

(b) State and explain the change in her observation for each bulb when she pressed the button. [2]

(i) Change observed for bulb P: _____

_____

(ii) Changed observed for bulb Q: _____

_____

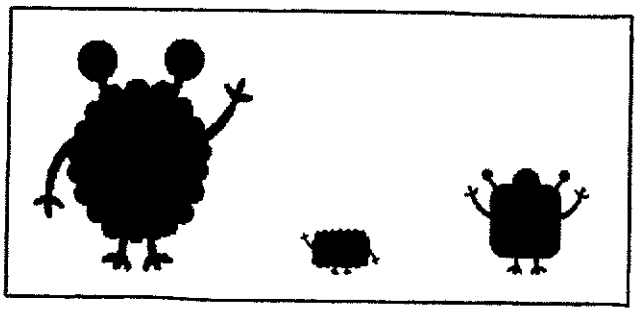
3

38. Evangeline has three puppets, X, Y and Z, of the same height as shown in the diagram below.

X Y Z

(a) Which property of light enables us to see the three puppets? [1]

She placed the three puppets between a torch and a screen and the shadows of the puppets cast on the screen are as follows.



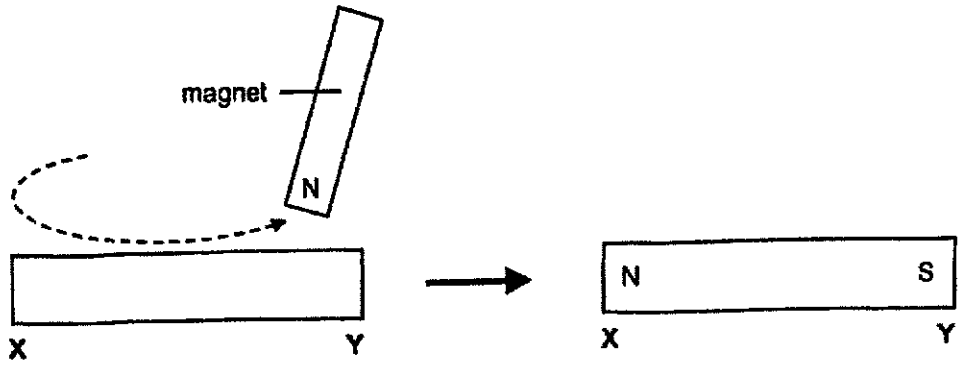
(b) How are shadows formed? [1]

(c) Based on the shadows cast on the screen above, which puppet, X, Y or Z, was placed furthest from the torch? Give a reason for your answer. [1]

(d) Without changing the positions of the three puppets, suggest one change that can be made to increase the size of all the three shadows cast on the screen. [1]

4

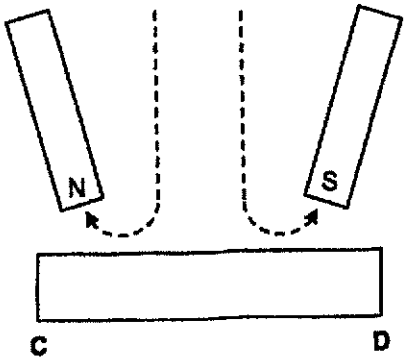
39. Jim magnetised steel bar XY using the 'stroke' method. The poles of the magnetised steel bar XY is as shown below.



(a) State one property of steel bar XY that allows it to be magnetised. [1]

_____

He magnetised another steel bar CD using two magnets as shown below.



(b) Using information from part (a), state the poles of magnet CD. [1]

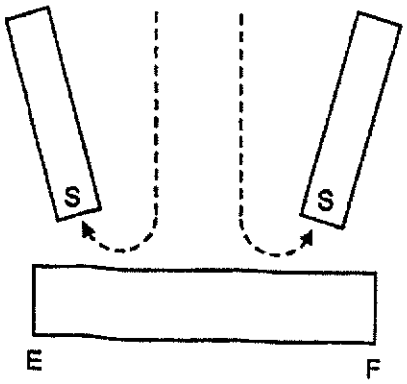
At C: _____

At D: _____

2

(Continue from Q39)

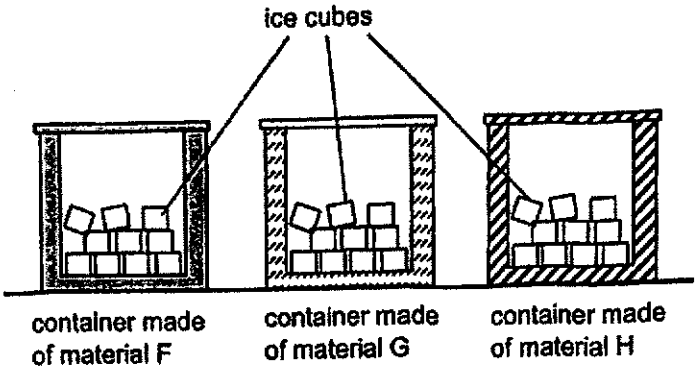
Jim wanted to magnetise steel bar EF using the South poles of two magnets as shown below.



(c) Explain using the properties of magnets why steel bar EF cannot be magnetised using the method above. [2]

2

40. Ethan set up the experiment as shown in the diagram below.



He placed the same amount of ice cubes into the each of the three containers and measured the time taken for all the ice to melt completely. He recorded the readings in the table below.

Material	Time taken for all the ice cubes to melt (min)
F	35
G	25
H	40

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

(b) Give a reason why Ethan used the same number of ice cubes in the three set-ups. [1]

Ethan wants to bring some hot chicken soup to his mother's house.

(c) Based on the results above, explain which material, F, G or H, is most suitable for making a container to keep the chicken soup hot for a longer time. [2]

- End of Paper -

4

Nanyang Primary School P6 SCIENCE Prelim 2024 Suggested Answers

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

Qn.	Acceptable Answers
29a.	Protect the eggs from predators/ Shelter the eggs from the rain or sun/ When the eggs hatched, the young has a ready source of food.
29b.	R blocks light from reaching S so S traps less light/ cannot trap light. Hence S makes less/ no food.
29c.	(i) X: Amphibian, Y: Fish (ii) When there is less oxygen / less food/ less shelter in water, X can go on land (to get oxygen/ food/ shelter) but not W.
30a	Producer: T; Plant-eater: Q, P; Animal-eater: S, R
30b.	New predator of R/ Outbreak of disease that infected and killed R/ Migration of R.
31a.	W was tricked/ confused the spots as eggs and when W attempts to eat the eggs/ spots, Male F kicks W away so less eggs get eaten.
31b.	**Choice:** Graph Q. **Data:** Z eggs hatch faster or hatch in a shorter time / F eggs hatch later than Z **Explain:** The larvae of Z can feed on the F's eggs before the eggs hatch.
32a.	To carry out gaseous exchange/ To take in carbon dioxide/ oxygen and give out oxygen/ carbon dioxide.
32b.	**Data:** Upper surface of Q not coated with oil and lower surface of P not coated with oil./ Lower surface of Q coated with oil and upper surface of P coated with oil. Leaf Q loses more water than P/ P loses less water than Q. **Explain:** Less water lost through lower surface of leaves/ More water lost through upper surface of leaves.
33a.	Carbon dioxide
33b.	Blood and blood vessels/ veins/ arteries/ capillaries.
34a.	The digestive system breaks down food into simple(r) substances that is absorbed into the blood/ bloodstream at the small intestine. The circulatory system transports this blood to different parts of the body.
34b.	There is less (exposed) surface area of meat in contact with digestive juices.

35a.	Wind/ moving air/ fan
35b.	(i) The toy boat still has (some) kinetic energy. (ii) All the kinetic energy has been converted to heat and sound energy.
35c.	**Suggestion:** Increase fan speed/ place boat nearer to fan/ blow at boat/ give boat a push/ open the sail wider. **Reason:** The boat has more kinetic energy to move further.
36a.	As the number of strips increases, the time taken for the ball to reach the bottom of the ramp increases.
36b.	Friction / frictional force and gravity / gravitational force
36c.	There is more friction between the Trisha's feet and the slope.
36d.	Repeat the experiment at least 3 times and calculate average/ check that the results are consistent results.
37a.	<table><tr><th></th><th colspan="2">Did the bulb light up?</th></tr><tr><th></th><th>Yes</th><th>No</th></tr><tr><td>Bulb P</td><td>✓</td><td></td></tr><tr><td>Bulb Q</td><td></td><td>✓</td></tr></table>
37b.	(i) Bulb P: **Change:** Brighter. **Explain:** More batteries so there will be more electric current/ electricity in the circuit. (ii) Bulb Q. **Change :** Light up. **Explain:** It is a closed circuit./ Electrical current can flow through.
38a.	Light can be reflected.
38b.	Shadows are formed when light is blocked.
38c.	Puppet Y. Its shadow is the smallest.
38d.	Move the torch nearer to the puppets / move the screen further away from the puppets.
39a.	It is magnetic.
39b.	At C: South. At D: North
39c.	Both E and F will be North pole/ same pole. Magnets should have a North and South pole / 2 different poles/ 2 unlike poles.
40a.	To find out how the different materials affect the time taken for the ice cubes to melt completely. **OR** To find out which material is the best/ poorest conductor of heat.
40b.	Result is only caused by the different materials used.
40c.	**Choice:** Material H **Data:** The ice cubes in container H took the longest time to melt. **Explain:** Material H is the poorest conductor of heat hence it conducts heat from the soup to the surrounding air the slowest.