

# METHODIST GIRLS' SCHOOL

Founded in 1887



## MID-YEAR EXAMINATION 2012 PRIMARY 4 SCIENCE

### BOOKLET A

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

### INSTRUCTIONS TO CANDIDATES

Do not turn over this page until you are told to do so.

Follow all instructions carefully.

Answer all questions.

Shade your answers in the Optical Answer Sheet (OAS) provided.

Name: \_\_\_\_\_ (    )

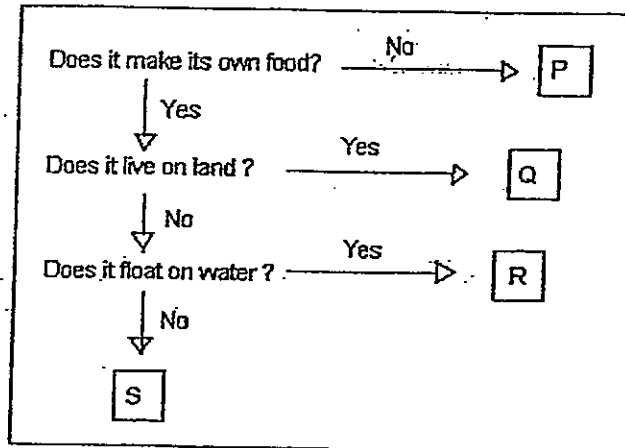
Class: Primary 4. \_\_\_\_\_

Date: 11 May 2012

This booklet consists of 20 printed pages including this page.

For each question from 1 – 30, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4). Shade the correct oval (1, 2, 3 or 4) on the optical answer sheet. (60 marks)

1 Study the classification chart below.



Which of the following correctly shows what P, Q, R and S most likely represent?

| P         | Q          | R        | S          |
|-----------|------------|----------|------------|
| lion      | cactus     | hydrilla | water lily |
| earthworm | sunflower  | duckweed | hydrilla   |
| grass     | cactus     | duckweed | hydrilla   |
| rabbit    | water lily | hydrilla | duckweed   |

2 A group of children carried out an experiment to find out the effects of overcrowding. They put some young plants into each pot and placed them in conditions indicated in the table below.

| Variable         | In the shade | In direct sunlight |
|------------------|--------------|--------------------|
| Number of plants | 15           | 15                 |
| Types of soil    | Clayey soil  | Garden soil        |
| Amount of soil   | 2 kg         | 2 kg               |
| Types of plant   | Balsam       | Balsam             |

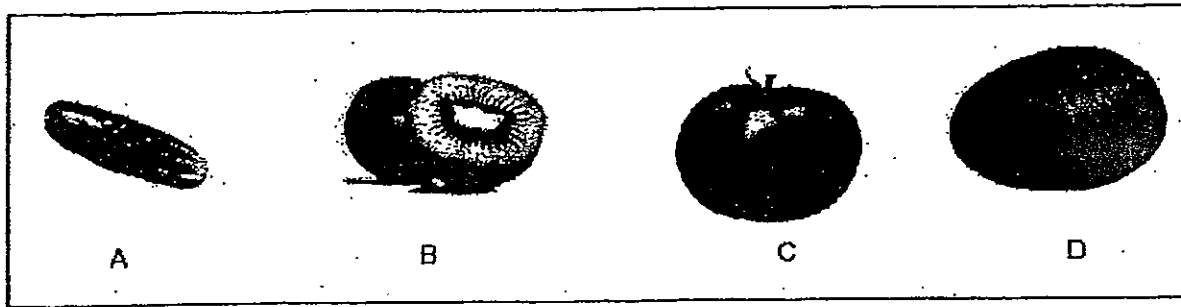
Their teacher told them that their experiment is not fair. What must the children do to make it a fair test. They must \_\_\_\_\_

- A: have the same type of soil.
- B: different amounts of water
- C: have different number of plants
- D: put the plants in the same place

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

Go on to the next page

3 Which of the following is a fruit?



- (1) A and C only
- (2) B and D only
- (3) A, B and C only
- (4) All of the above

4 Study the diagrams below. X, Y and Z represent the characteristics of the animals.

| Animal                                                                              | X | Y | Z |
|-------------------------------------------------------------------------------------|---|---|---|
|   |   |   |   |
|  |   |   |   |
|  |   |   |   |

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

|     | X         | Y        | Z         |
|-----|-----------|----------|-----------|
| (1) | Has wings | Can fly  | Lay eggs  |
| (2) | Can fly   | Lay eggs | Has wings |
| (3) | Has wings | Lay eggs | Can fly   |
| (4) | Lay eggs  | Can fly  | Has wings |

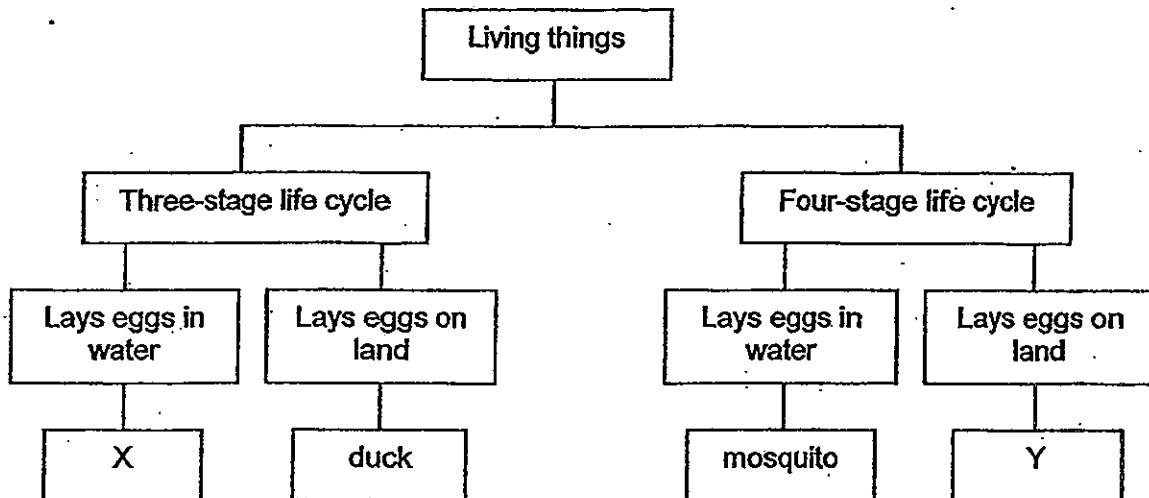
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- 5 Eddy observed and recorded the changes in the bean seed placed on a moist cotton wool. Arrange her observations in order of appearance.

A: Two green leaves appear.  
 B: A tiny shoot grows upwards.  
 C: A root grows downwards in search of water.  
 D: The food stored in the seed leaves gets used up.  
 E: The bean absorbs water, swells and the seed coat cracks open.

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

- 6 Study the classification table below.

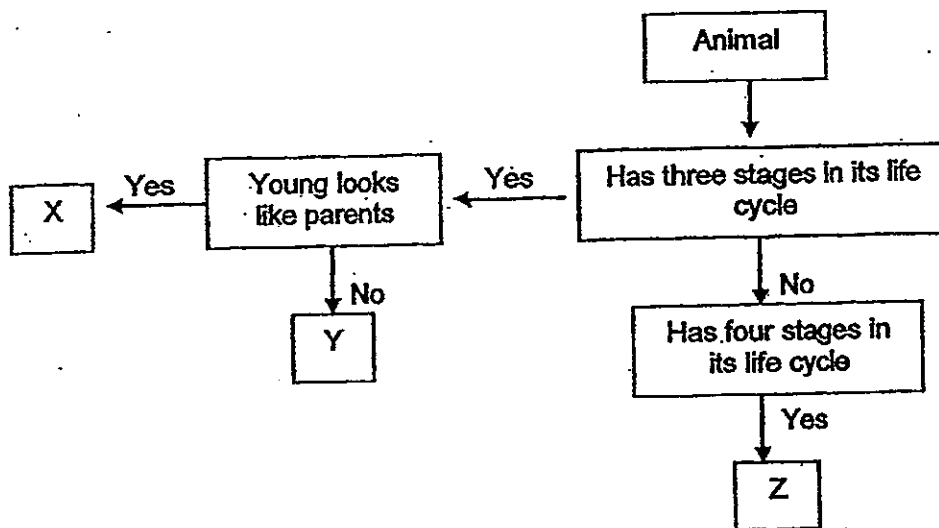


What living things are X and Y likely to be?

|     | X         | Y         |
|-----|-----------|-----------|
| (1) | Dragonfly | Chicken   |
| (2) | Tortoise  | Cockroach |
| (3) | Beetle    | Bird      |
| (4) | Frog      | Butterfly |

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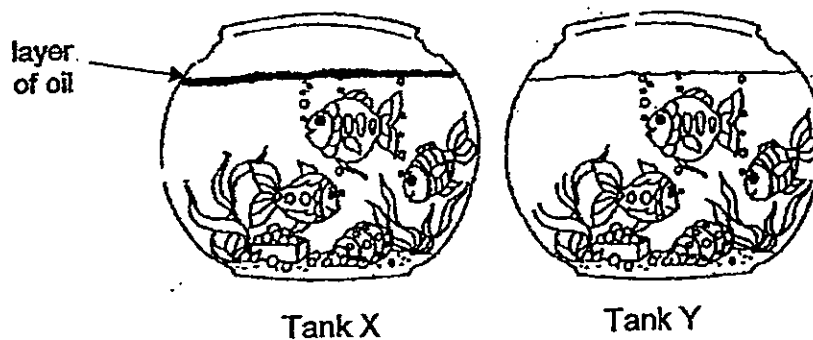
7 Study the flow chart below.



Based on the given flow chart, what are X, Y and Z likely to be?

|     | X           | Y         | Z               |
|-----|-------------|-----------|-----------------|
| (1) | Grasshopper | Frog      | Mealworm beetle |
| (2) | Duck        | Dolphin   | Butterfly       |
| (3) | Toad        | Cockroach | Housefly        |
| (4) | Kangaroo    | Moth      | Cockroach       |

8 Study the diagram carefully.

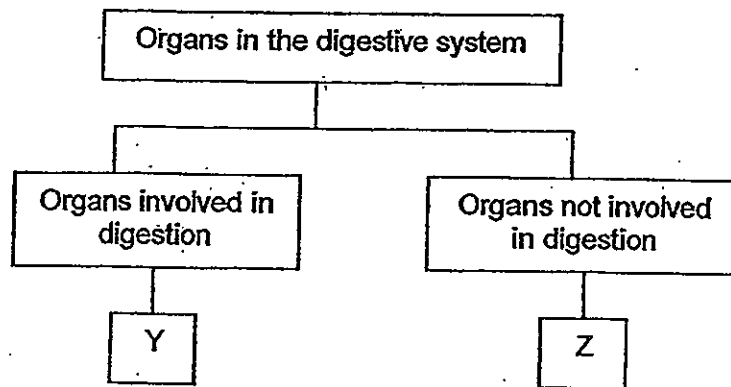


The fish in Tank Y remained alive but all the fish in Tank X were found dead after two days. What is the most likely reason for this to happen?

- (1) The fish in Tank X died as they were poisoned.
- (2) The fish in Tank Y survived as they had enough food.
- (3) The fish in Tank Y were stronger than those in Tank X.
- (4) The fish in Tank X died as they did not have enough air.

Go on to the next page

- 9 The organs that make up the digestive system can be placed into two groups as shown below.



Which of the following organs can be placed at Y and Z?

|     | Y                                | Z                              |
|-----|----------------------------------|--------------------------------|
| (1) | Gullet, mouth, small intestine   | Large intestine, stomach       |
| (2) | Small intestine, stomach, mouth  | Large intestine, gullet        |
| (3) | Large intestine, gullet, stomach | Small intestine, mouth         |
| (4) | Small intestine, stomach         | Large intestine, gullet, mouth |

- 10 Which of the following is/are the function(s) of the skeletal system in the human body?

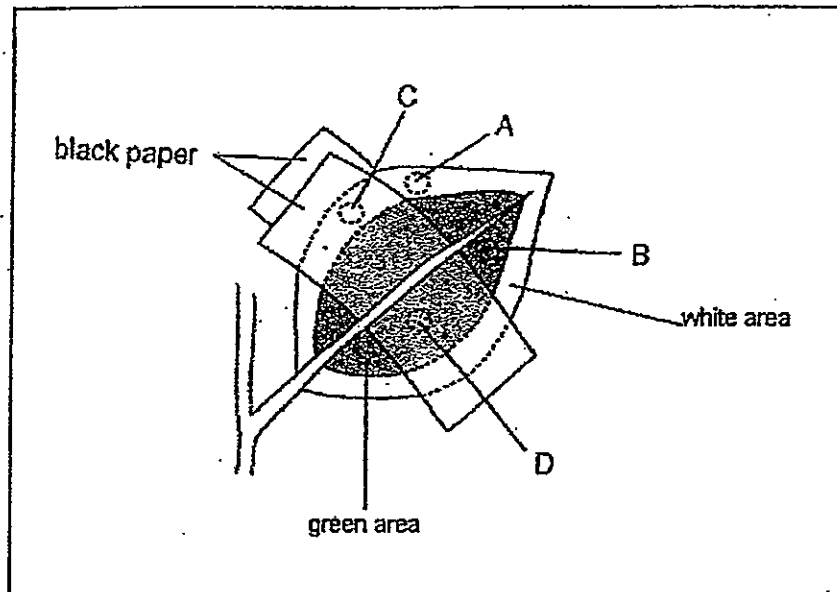
- A: support the body
- B: give body its shape
- C: absorb digested food into the blood
- D: protect the delicate internal organs in the body

- (1) A and B only
- (2) B and D only
- (3) A, B and D only
- (4) All of the above

Go on to the next page

7

- 11 A plant has green and white variegated leaves. A variegated leaf has different colours on it. The plant was placed in the dark for 24 hours to remove starch in the leaves. Then the leaf was partly covered with two strips of black paper as shown below.

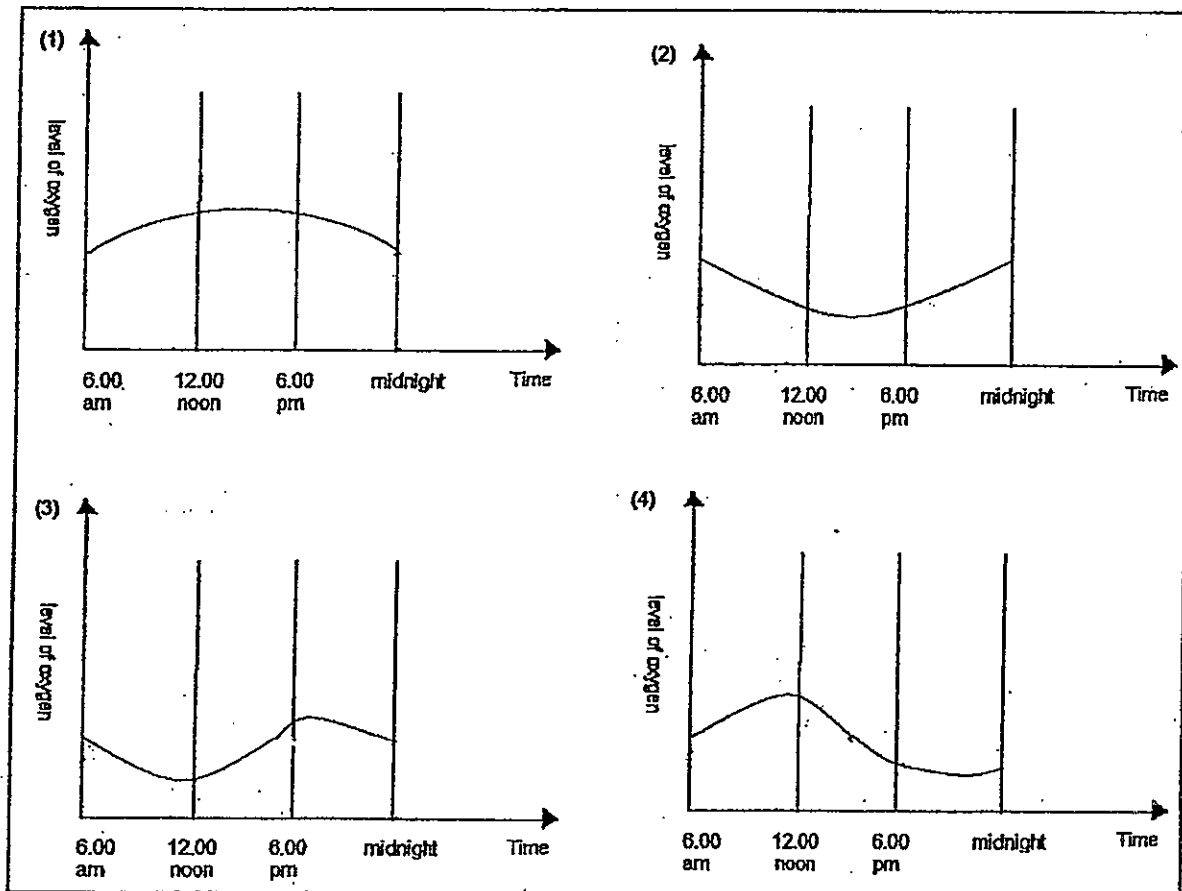


The plant was then placed under sunlight for six hours. After six hours, the strips of black paper were removed and tested for the presence of starch. In which of the labelled areas will starch not be found?

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

- 12 The graphs below show the levels of oxygen in the air at different times of the day in a park.

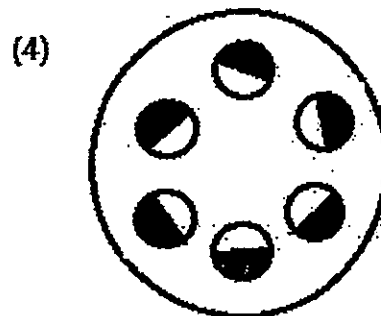
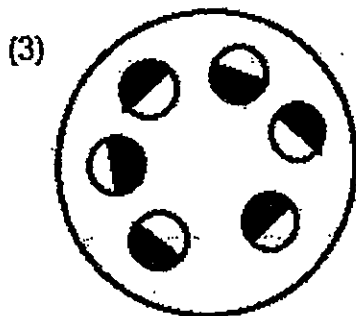
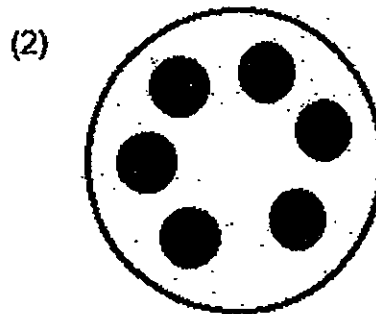
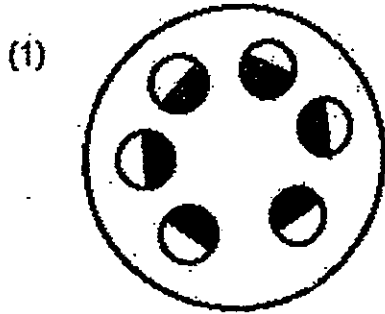
Which of the graphs shows the level of oxygen in the air from 6 a.m. to 12 midnight?



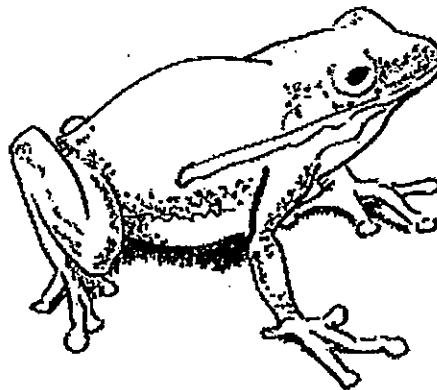
- 13 The lungs and the heart are two organs in the human body. Which one of the following statements on the functions of the lungs and the heart is true?

- (1) The lungs remove carbon dioxide from the body.
- (2) The heart removes carbon dioxide from the lungs.
- (3) The lungs transport oxygen produced by the heart.
- (4) The heart takes in oxygen from the surroundings directly into the body.

14. Samantha placed a balsam plant into a beaker containing red-coloured water. After 1 day, she cut a cross-section of the stem and saw that some parts of the cross-section were stained red. Which of the following cross-section would represent what she saw?

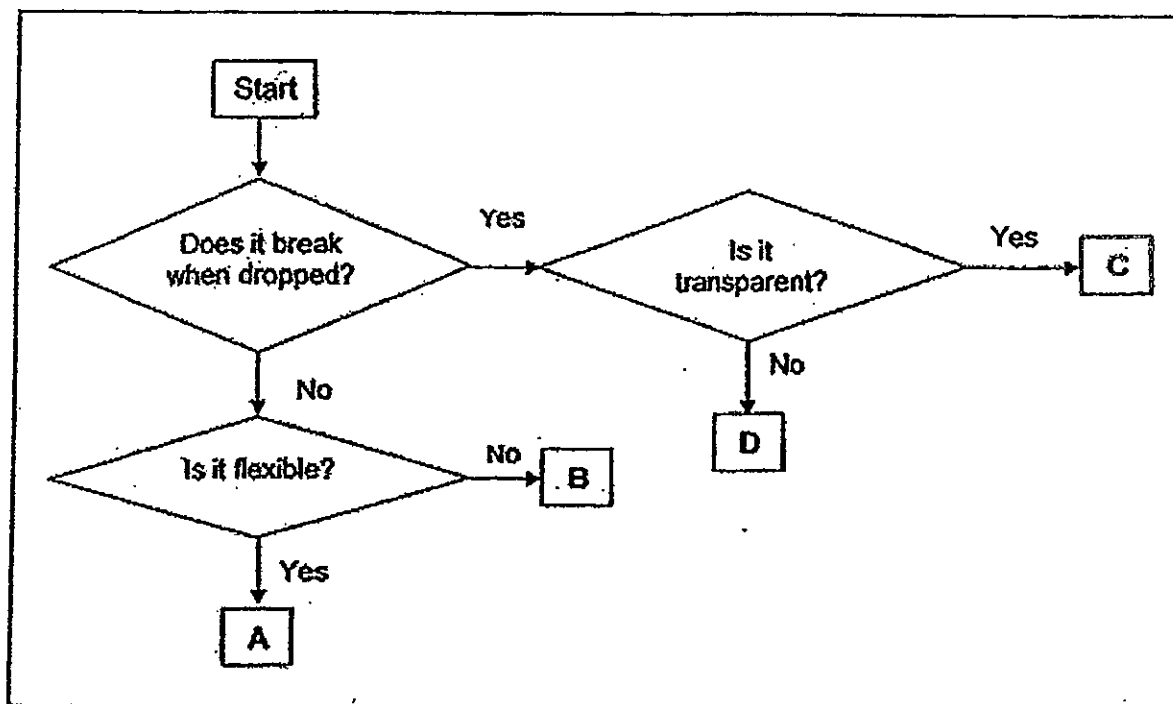


15. Which part of the frog helps it to breathe on land?



- (1) Lungs
- (2) Moist skin
- (3) Gills
- (4) Green skin

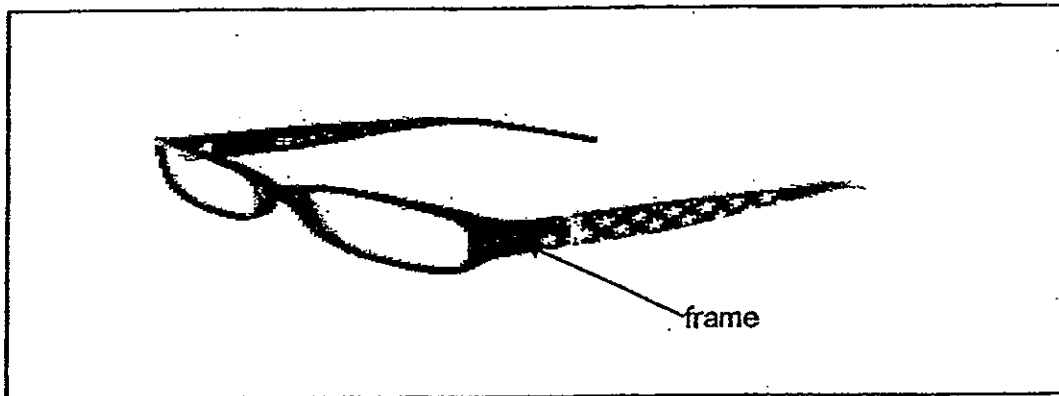
- 16 The flow chart below shows the properties of four different materials, A, B, C and D.



Which of the following can A, B, C and D be?

|     | A            | B            | C            | D            |
|-----|--------------|--------------|--------------|--------------|
| (1) | Plastic fork | Clay Doll    | Nylon Gloves | Beaker       |
| (2) | Nylon Gloves | Plastic fork | Beaker       | Clay Doll    |
| (3) | Clay Doll    | Beaker       | Plastic fork | Nylon Gloves |
| (4) | Nylon Gloves | Beaker       | Clay Doll    | Plastic fork |

- 17 The diagram below shows a pair of Mrs Tan's spectacles.



Mrs Tan carried out some tests on a few materials, P, Q, R and S to find out which material was most suitable for making the frame of her spectacles.

- Test E: Bending the materials
- Test F: Stretching the materials
- Test G: Shining light through the materials
- Test H: Finding out if the materials could float on water

Which of the following test(s) is/are necessary?

- (1) Test E and Test F only
- (2) Test E and Test G only
- (3) Test G and Test H only
- (4) Test F and Test H only

- 18 L, M and N describe the 3 states of matter.

L: Definite volume and definite shape

M: Definite volume and no definite shape

N: No definite volume and no definite shape

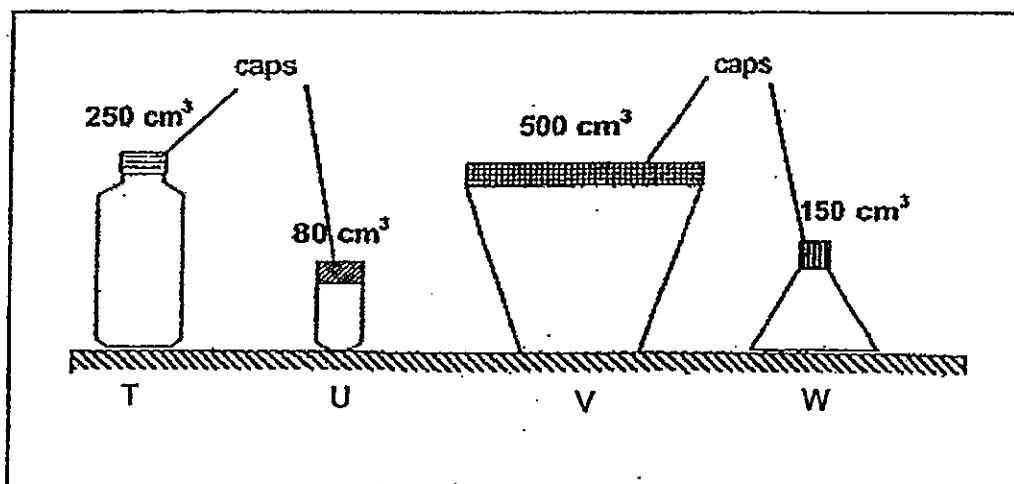
The changes in the state of water are shown below:

Water  $\longrightarrow$  Steam  $\longrightarrow$  Water  $\longrightarrow$  Ice

Use L, M and N to represent the above changes of the states of water.

- (1) L  $\longrightarrow$  M  $\longrightarrow$  L  $\longrightarrow$  N  
 (2) L  $\longrightarrow$  N  $\longrightarrow$  M  $\longrightarrow$  L  
 (3) M  $\longrightarrow$  L  $\longrightarrow$  N  $\longrightarrow$  M  
 (4) M  $\longrightarrow$  N  $\longrightarrow$  M  $\longrightarrow$  L

- 19 The diagram below shows 4 different containers of different capacities.

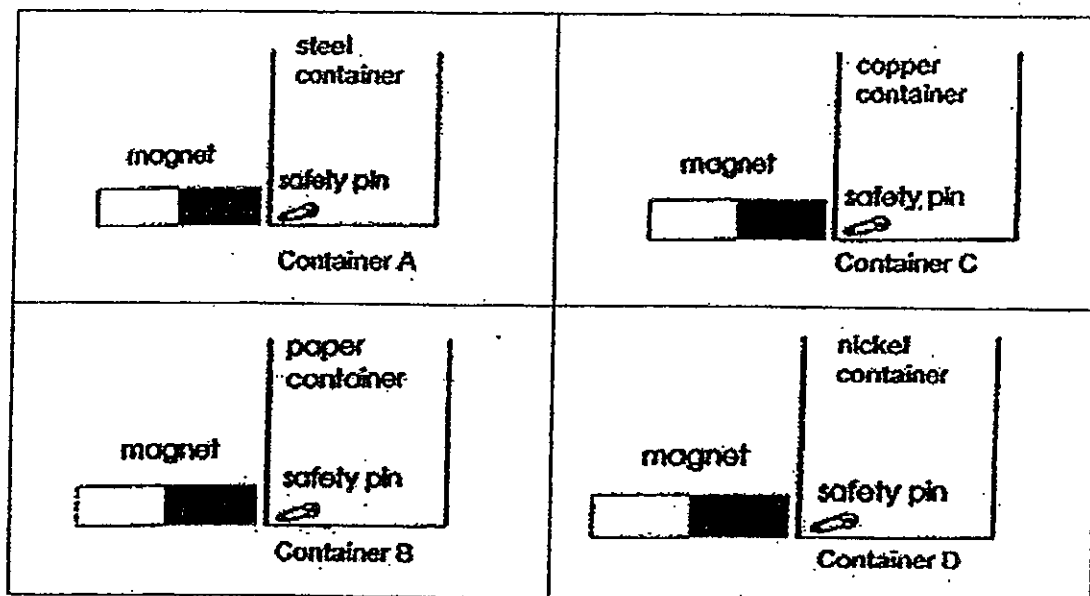


Which of the containers can be totally filled with  $110 \text{ cm}^3$  of air?

- (1) T and V only  
 (2) U and W only  
 (3) T, V and W only  
 (4) T, U, V and W

|     |  |
|-----|--|
| (1) |  |
| (2) |  |
| (3) |  |
| (4) |  |

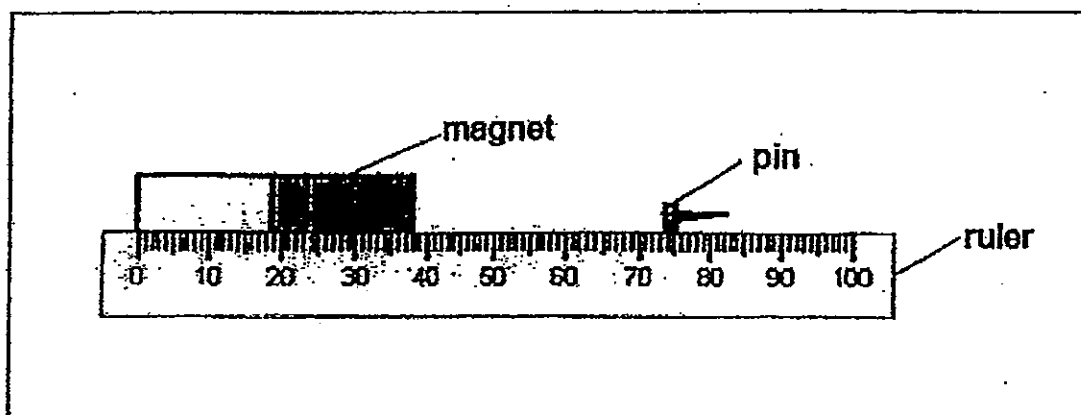
- 21 One iron safety pin is placed in each of the following containers A, B, C and D as shown below. The containers are made of different materials as labelled in the diagram. Eugenia wants to find out which container she will be able to retrieve the iron safety pin by sliding a magnet upwards along the side of the container. The thickness of each container is the same and the same magnet is used for each of the containers.



Which of the container(s) will Eugenia be able to retrieve the iron safety pin from using the magnet?

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

- 22 Mary set up an experiment as shown in the diagram below:



She wanted to find out how the strength of a magnet will affect the distance a pin could be placed for the magnet to be able to attract it.

Which of the following could be a hypothesis of her experiment?

- (1) The lighter the pin, the further the distance the magnet could attract it.
- (2) The greater the strength of the magnet, the further the distance the magnet could attract the pin.
- (3) The longer the magnet, the greater the strength of the magnet.
- (4) The bigger the magnet, the further the distance the magnet could attract the pin.

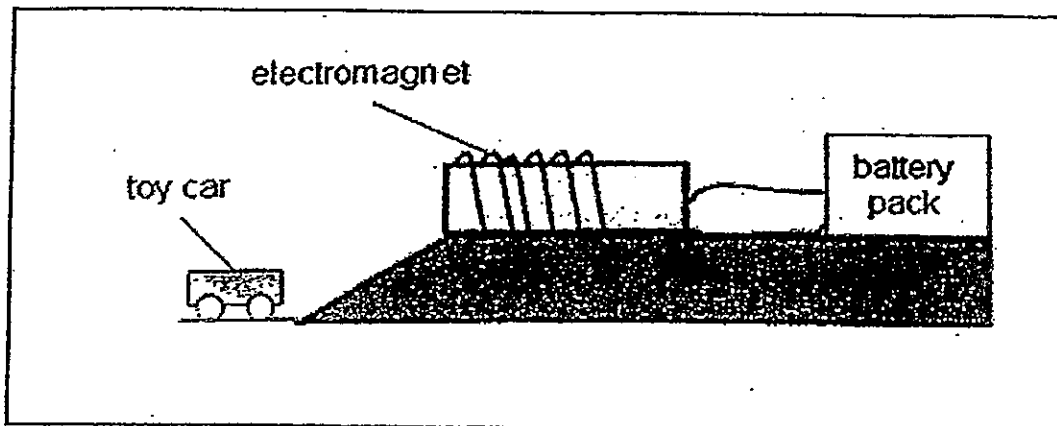
- 23 Four girls described the property of magnets as follows:

Anne : All metals are magnetic materials  
 Belle : All magnets are made of metal.  
 Cindy : Magnet can attract and repel all metals.  
 Denise : All magnets have two poles.

Whose statement(s) is/are correct?

- (1) Belle only
- (2) Denise only
- (3) Cindy and Denise only
- (4) Anne and Belle only

- 24 Ferb set up an experiment as shown below:



When he turned the switch on, the steel toy car moved up the ramp and went towards the electromagnet. What changes could he make so that the time taken for the car to reach the electromagnet would decrease?

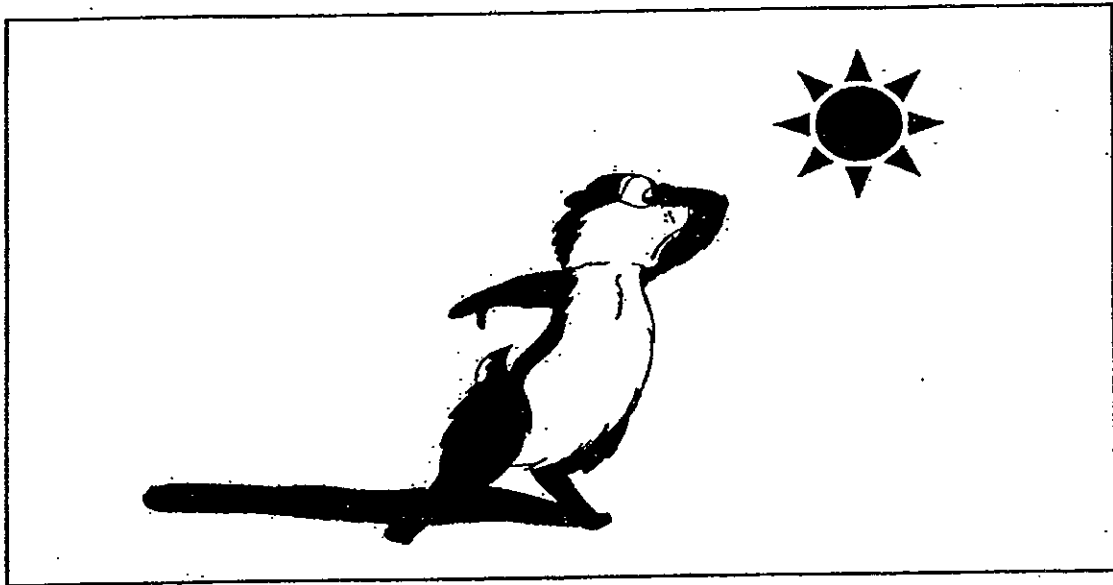
- (1) Use a longer magnet.
- (2) Use a heavier toy car.
- (3) Increase the number of batteries in the battery pack.
- (4) Decrease the number of coils around the electromagnet.

- 25 We can see the moon at night because:

- A : It gives out light on its own  
 B : It reflects light from the sun  
 C : It absorbs light from the sun  
 D : It reflects light into our eyes

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

- 26 The shadow of the animal shown below is formed because \_\_\_\_\_



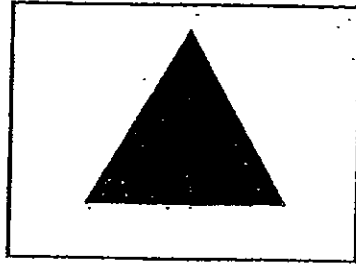
- the animal absorbs sunlight.
- the animal reflects sunlight.
- the source of light is far away.
- light cannot pass through the animal.

- 27 Mary wanted to conduct an experiment to find out which object allows light to pass through. In order to conduct a fair experiment, which of the objects listed below must Mary use?

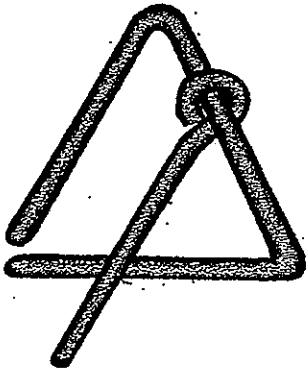
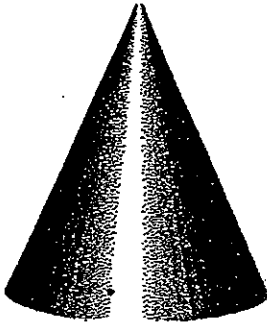
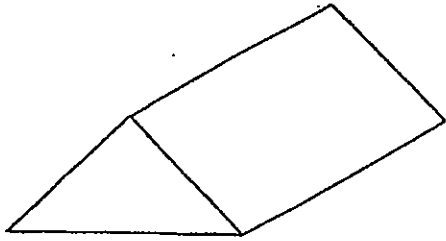
- A: a torch
- B: a book
- C: a mirror
- D: a sheet of glass
- E: a sheet of cardboard

- (1) A, D and E only
- (2) A, B and C only
- (3) A, B, C and E only
- (4) All of the above

28 The diagram below shows the shadow formed by an object.



Which of the following objects COULD NOT have formed the shadow shown above?

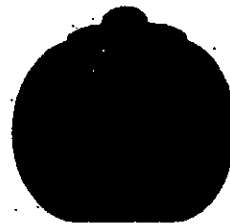
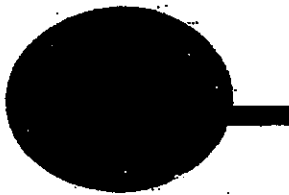
|                                                                                                                                    |                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <p>(1)</p>  <p>A triangle musical instrument</p> | <p>(2)</p>  <p>A traffic sign</p> |
| <p>(3)</p>  <p>A cone</p>                       | <p>(4)</p>  <p>A block</p>       |

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- 29 Mrs Tan has a porcelain mug and a ceramic teapot shown below:



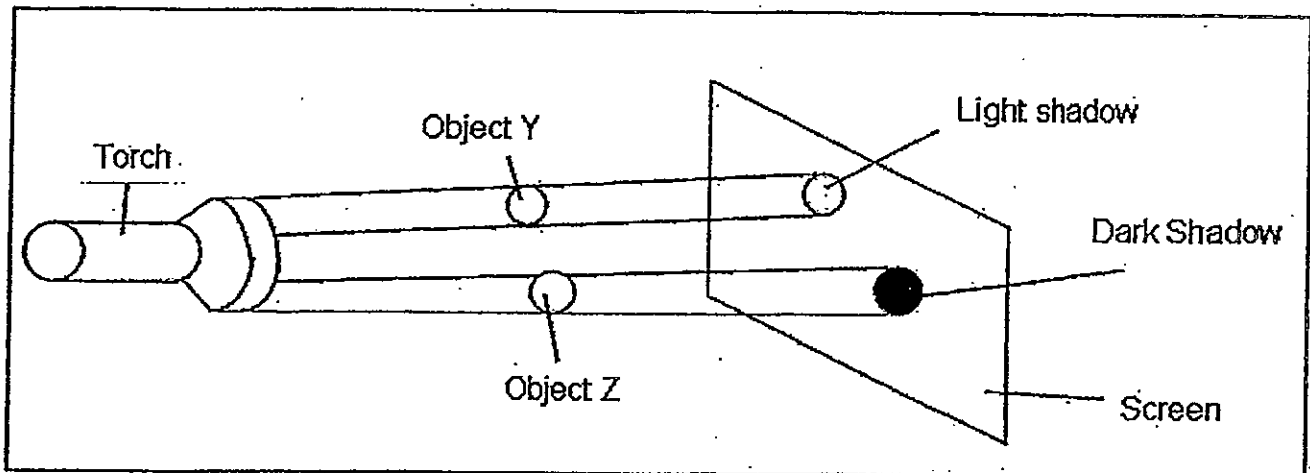
The following shows the shadows of the porcelain mug and a ceramic teapot:



From which side of each object was the light shone to form these shadows?

|     | Shadow of porcelain mug | Shadow of ceramic teapot |
|-----|-------------------------|--------------------------|
| (1) | Top                     | Side                     |
| (2) | Side                    | Top                      |
| (3) | Top                     | Top                      |
| (4) | Side                    | Side                     |

- 30 A torch was shone onto two objects, Y and Z, as shown in the diagram below:



The shadow formed by object Y seemed much lighter than the one formed by object Z. Which are the materials that object Y and object Z are likely to be made of?

- (1)  
(2)  
(3)  
(4)

| Object Y        | Object Z        |
|-----------------|-----------------|
| Wood            | Steel           |
| Clear Plastic   | Styrofoam       |
| Frosted Glass   | Frosted Plastic |
| Frosted Plastic | Iron            |

End of Booklet A

**METHODIST GIRLS' SCHOOL**

Founded in 1887



**MID-YEAR EXAMINATION 2012**  
**PRIMARY 4**  
**SCIENCE**

**BOOKLET B**

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

**INSTRUCTIONS TO CANDIDATES**

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

Name: \_\_\_\_\_ (    )

Class: Primary 4. \_\_\_\_\_

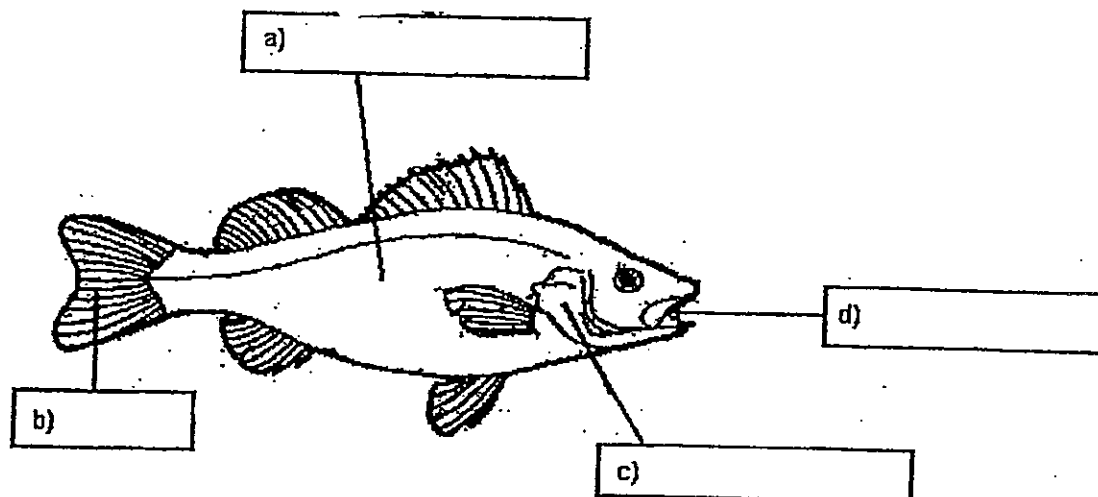
Date: 11 May 2012

|           |       |
|-----------|-------|
| Booklet A | / 60  |
| Booklet B | / 40  |
| TOTAL     | / 100 |

This booklet consists of 12 printed pages including this page.

For questions 31 to 43, write your answers in the spaces provided. (40 marks)

- 31 Label the parts of the fish in the boxes provided. (2m)



- 32 Some living things are classified into two groups, A and B as shown below.

| Group A        | Group B |
|----------------|---------|
| Yeast          | Goose   |
| Bracket fungus | Swan    |

- a) Give suitable headings for Group A and Group B. (1m)

Group A : \_\_\_\_\_

Group B : \_\_\_\_\_

- b) In which group would you place toad stools? (1m)

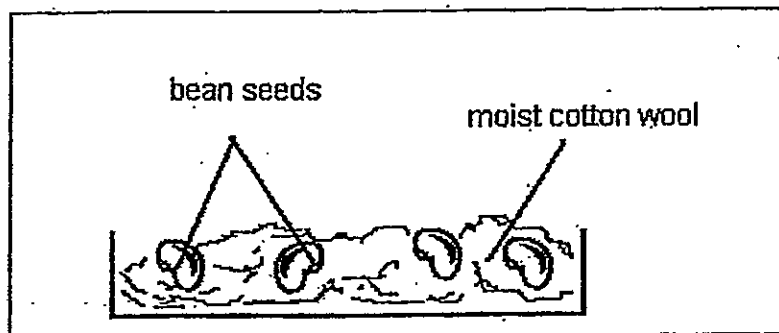
\_\_\_\_\_

- c) What is the outer covering of the animals in Group B? (1m)

\_\_\_\_\_

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- 33 Alice wanted to investigate the best temperature for seed germination and set up five experiments. She placed some green bean seeds on a moist cotton wool as shown in the diagram below.



| Set-up      | A       | B      | C    | D         | E    |
|-------------|---------|--------|------|-----------|------|
| Place       | Freezer | Fridge | Room | Warm room | Oven |
| Temperature | 4°C     | 10°C   | 25°C | 28°C      | 80°C |

- a) Name two important variables that Alice must control during the experiment. (2m)
- \_\_\_\_\_
- b) In which two set-ups will the bean seeds grow into young plants? (1m)
- \_\_\_\_\_
- c) Why do you think that the seeds in Set-up E did not grow into young plants? (1m)
- \_\_\_\_\_

- 34 Danny measured the mass of one black bean seed. He then put it in a pot and placed it near a window. As the seed grew, he measured the mass of the seedling at regular intervals and recorded the data as shown below.

| A                                                                                 | B                                                                                 | C                                                                                 | D                                                                                  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |  |  |
| 2g                                                                                | 5g                                                                                | 12g                                                                               | 18g                                                                                |

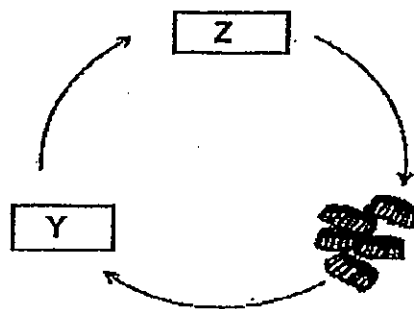
- a) Why was there an increase in the total mass from stage A to stage D? (1m)

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- b) If Danny removed part Y at stage D, will the seedling continue to grow and why? (1m)

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- 35 The diagram shows the life cycle of a cockroach.



- a) What is the name of the young cockroach at stage Y? (½m)

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- b) Why does the cockroach lay many eggs at one time? (1m)

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- c) Give a difference between the appearance of the cockroach at Stage Y and Stage Z. (1m)

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Go on to the next page

- 36 The table below shows the percentage of three types of undigested food, A, B and C, after it passes through each part of the digestive system.

| Part of digestive system that undigested food has just passed through | % of undigested food remaining |     |     |
|-----------------------------------------------------------------------|--------------------------------|-----|-----|
|                                                                       | A                              | B   | C   |
| Mouth                                                                 | 80                             | 100 | 100 |
| Gullet                                                                | 80                             | 100 | 100 |
| Stomach                                                               | 80                             | 60  | 100 |
| Small intestine                                                       | 20                             | 10  | 100 |
| Large intestine                                                       | 20                             | 10  | 100 |

- a) Based on the percentage of undigested food in each part of the system, what can you conclude about the gullet? (1m)

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- b) The organ in which most digestion takes place is the \_\_\_\_\_ (½m)

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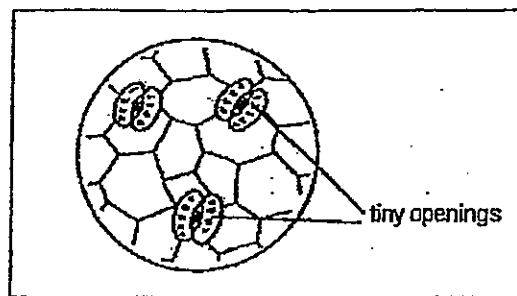
- c) What happens to the food that is digested? (1m)

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- 37 The following picture shows a magnified image of a part of a green plant on land.



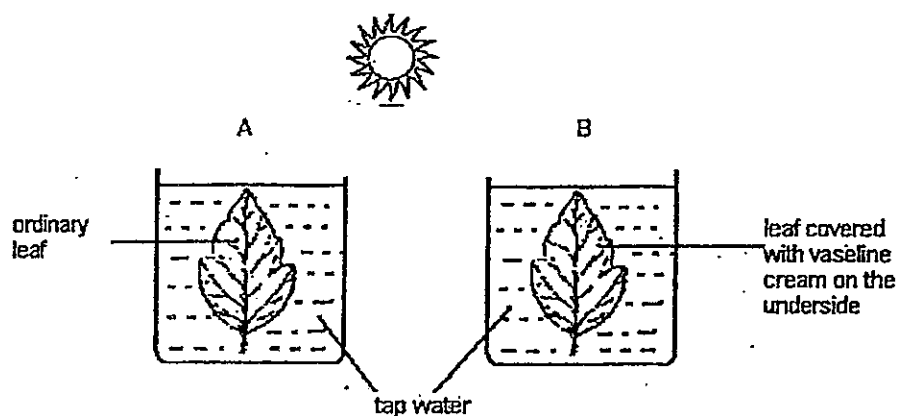
- a) What is the purpose of the tiny openings on the plant part? (1m)

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The following experiment is conducted on two healthy leaves plucked from the same plant.



- b) What can you observe in both the beakers after a while? (2m)

Beaker A : \_\_\_\_\_

Beaker B : \_\_\_\_\_

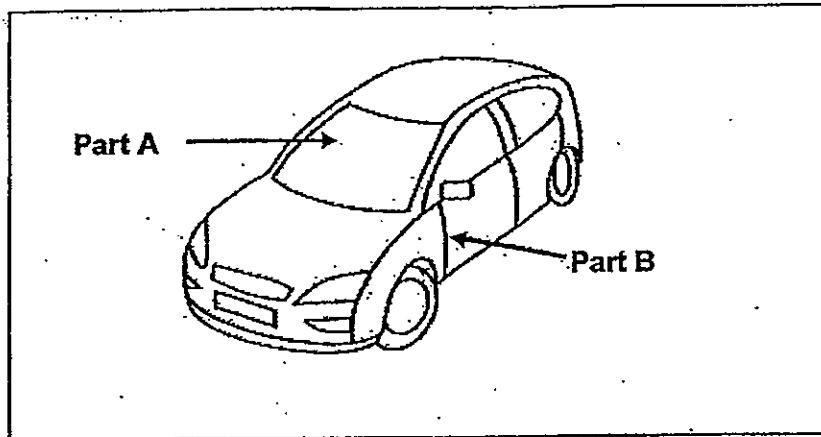
- c) How would the results of the experiment differ if the experiment is carried out at night when there is no light? (1m)

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- 38 The diagram below shows Mrs Lee's car.



- a) Suggest a suitable material for making Part A and B of the car. (1m)

(i) Part A: \_\_\_\_\_

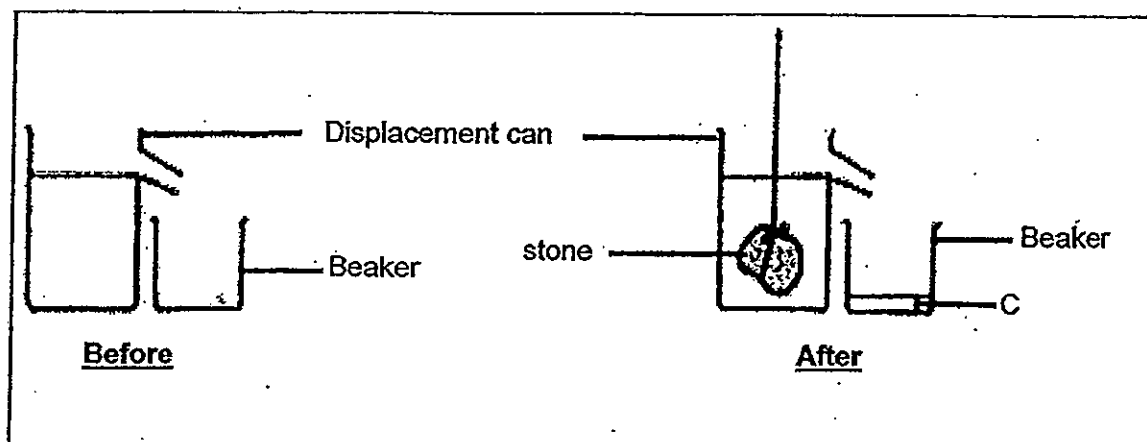
(ii) Part B: \_\_\_\_\_

- b) Give a reason for the material chosen for Part A. (1m)

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39 Sally carried out an experiment as shown in the diagram below.



When she lowered a stone into the displacement can, some water was collected in the empty beaker. This amount of water was labelled C.

a) What is Sally trying to find out about the stone from C? (½m)

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b) What will happen to C if the stone that was placed into the displacement can was bigger? (½m)

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c) Explain how water gets from the displacement can into the beaker. (2m)

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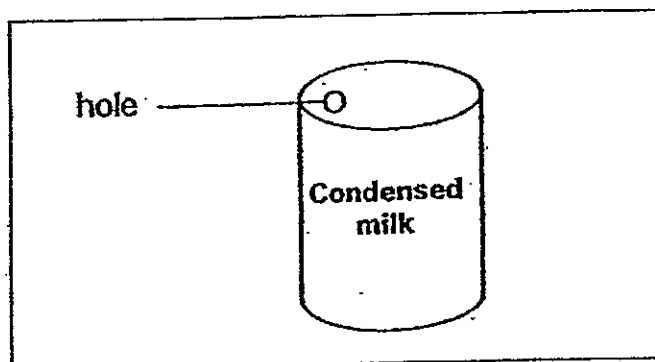
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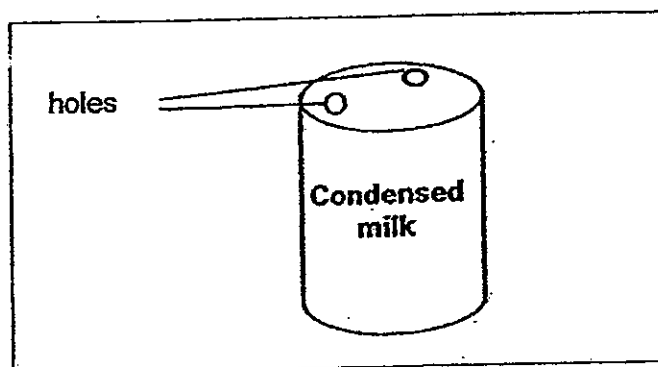
d) What property does the stone have based on Sally's observation of the above experiment? (1m)

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- 40 Mrs Tan made a hole on a can of condensed milk as shown below.



She tried pouring the milk out but found that it flowed out very slowly. She then made another hole as shown below:



She observed that the milk flowed faster this time.

- a) Explain how the condensed milk was able to flow <sup>faster</sup> out of the can. (2m)

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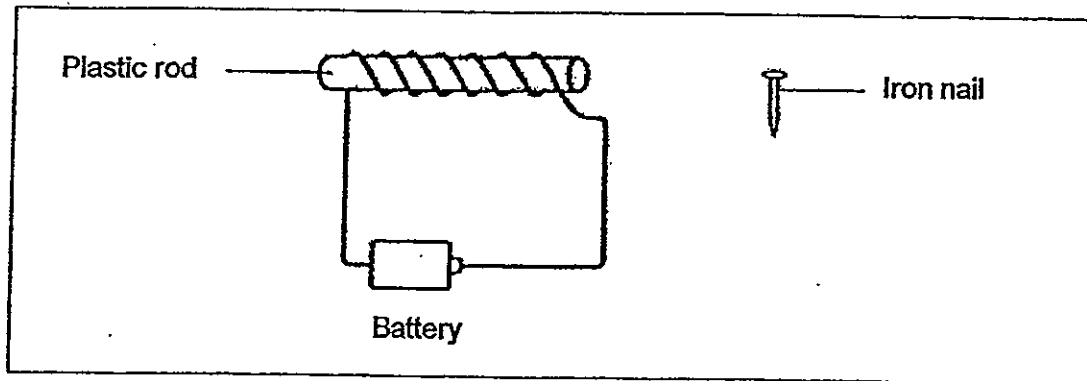
---

Mrs Tan let the condensed milk flow into a glass container.

- b) She found out that the volume of condensed milk that was in the glass container is the same volume as when it was in the can. What does this show about the milk? (1m)

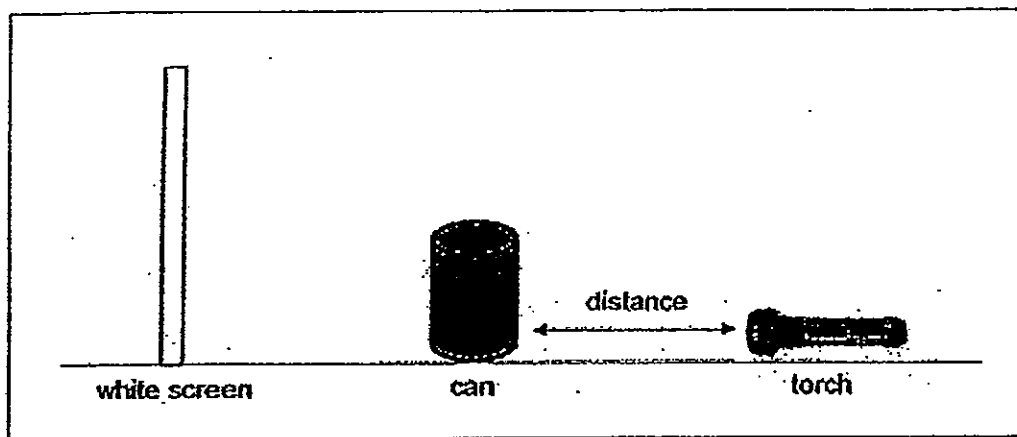
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- 41 Jane set up the experiment as shown below:



- a) What will she observe when the iron nail is placed close to the plastic rod?  
(1m)
- 
- b) Explain your answer given in (a).  
(1m)
- 
- 
- c) If she wants to make a strong electromagnet, what are the two changes she has to make?  
(2m)
- 
-

- 42 Cecilia conducted an experiment with a torch, a can and a white screen as shown below.



She changed the distance between the torch and the can by moving the torch to observe the effects on the shadow formed on the white screen. She recorded her findings in a table as shown below.

| Distance between the torch and the can (cm) | Height of shadow formed on the white screen (cm) |
|---------------------------------------------|--------------------------------------------------|
| 50                                          | 10                                               |
| 40                                          | 12                                               |
| 30                                          | 14                                               |
| 20                                          | 16                                               |

- a) Based on the table above, what is the relationship between the distance of the torch and the can, and the height of the shadow formed on the white screen? (2m)

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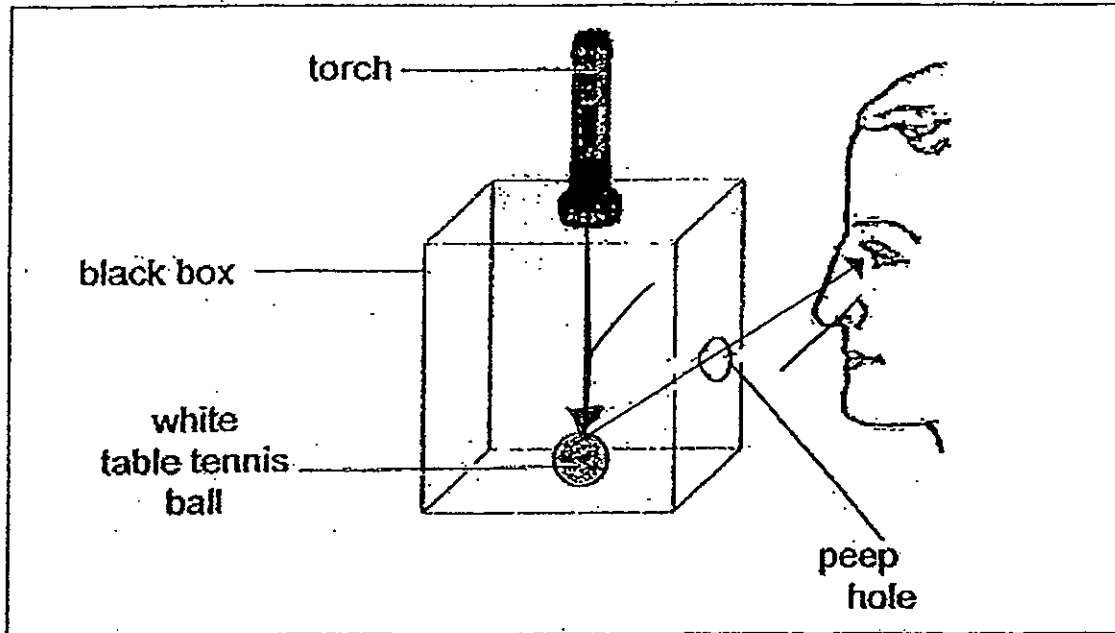
- b) Estimate the distance between the torch and the can when the height of the shadow formed on the white screen is 11cm. (1m)

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- 43 Christina conducted an experiment using a black box and a white table tennis ball as shown below. The black box has a peep hole and is fitted with a torch light on the top of the box which can be turned on to brighten the box within.



At first, Christina could not see the white table tennis ball in the black box through the peeping hole.

- a) Explain why she could not see the white tennis ball. (1m)
- 
- b) Without opening the black box, describe what Christina has to do in order for her to see the white table tennis ball through the peeping hole. (1m)
- 
- c) In the diagram above, draw two arrows to show how a light source allows Christina to see the white table tennis ball in the black box through the peeping hole. (2m)

End of Paper

# ANSWER SHEET

**EXAM PAPER 2012**

**SCHOOL : MGS**

**SUBJECT : PRIMARY 4 SCIENCE**

**TERM : SA1**

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

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

31)a)Body      b)Tail      c)Gills      d)Mouth

32)a)A: Fungi      B: Birds  
 b)Fungi  
 c)Feathers

33)a)The amount of bean seeds and the amount of moist cotton wool.  
 b)Set-up C and D.  
 c)The seeds in Set-up E was put in the oven and the oven was too warm for the seeds to germinate.

34)a)The seedling has increased in mass as the roots, stem and leaves are develop.  
 b)Yes, because its leaves has already grown and can make food of its own.

35)a)Nymph.  
 b)So that there is a higher chance of eggs becoming adults.  
 c)The cockroach at stage Y does not have wings while the cockroach in stage Z has wings.

36)a)The gullet only helps transport the food from the mouth to the stomach.  
It does not help in digestion at all.

b)Small intestine.

c)Digested food is absorbed through the small intestine walls into the blood stream to be to all parts of the body.

37)a)To allow gaseous exchange to take place.

b)A: Bubbles are seen on the underside of the leaf.

B: No bubbles are seen.

c)Less bubbles are seen on the underside of the leaf while there is no change to B.

38)a)i)Glass            ii)Metal

b)The car window needs to be transparent in order for the driver to see where he or she is driving.

39)a)She is trying to find out the volume of the stone.

b)C will be more.

c)When the stone is lowered into the displacement can, water in it will overflow from the spout and into the beaker.

d)The stone has a definite volume.

40)a)Air enters one hole and pushed the condensed milk out the other hole caused the milk to flow out of the second hole much faster.

b)The milk has a definite volume. Liquid has a definite volume.

41)a)Nothing would happen.

b)Plastic is a non-magnetic material thus it cannot be made into an electromagnet.

c)She has to change the plastic rod to a steel rod into a magnetic material and increase the number of batteries used.

42)a)The nearer the light source is to the object, the bigger the shadow.

b)45cm.

43)a)There is no light to reflect the ball into her eyes.

b)She had to turn on the torch.

c)

