

NAME:



OUNDLE

School

2018 Junior Entrance Examinations

Science Paper

Time allowed: **60 minutes**

Instructions

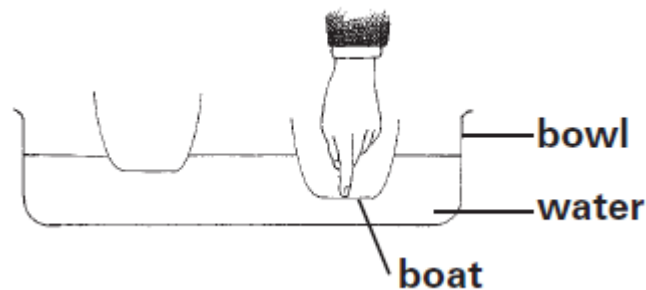
- You have **10 minutes reading time**. In this time, you should look at the questions in the paper and choose which to do.
- **Answer only 3** of the 5 questions in the paper, the choice is totally up to you.
- You have **50 minutes to answer your 3 questions**.
- You will need a pen, pencil, ruler and calculator

This question is about Forces

1. Our life is full of forces. We cannot see them but we can see how they affect things. Write down three ways in which a force can affect an object.

[2]

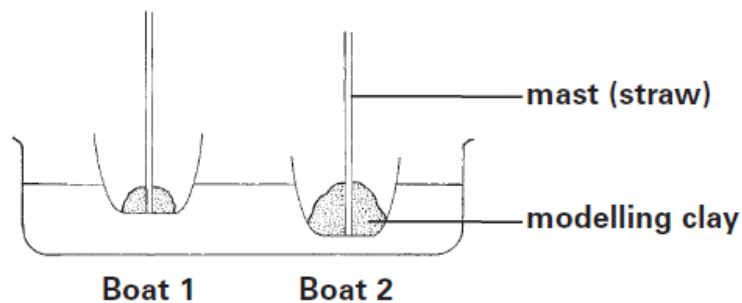
Mark puts two boats in a bowl of water. They float on the water. He pushes down on one of the boats with his finger.



- a. What does Mark feel as he pushes down?
- A. The force from the water pushing the boat up.
 - B. The force from the air pushing the boat up.
 - C. The force from the water pushing the boat down.
 - D. The force from the air pushing the boat down.

Answer [1]

- b. Mark then makes masts for the boats with straws. He attaches the masts to the boats using modelling clay.

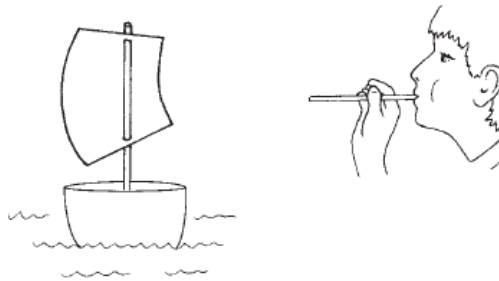


Explain why boat 2 floats lower in the water than boat 1.

. [1]

- c. To complete the boats Mark makes sails for the boats out of paper.
He uses a straw to blow one of the boats along.

Draw an arrow on the picture to show the direction of the force pushing the boat along.



[1]

- d. What is the name of the force that slows the boat down?

_____ [1]

- e. Mark would like his boat to move faster through the water.
Give two changes Mark could make to boat for it to move faster through the water?
Explain why each change will make the boat move faster.

Change 1:

Explanation 1:

_____ [2]

Change 2:

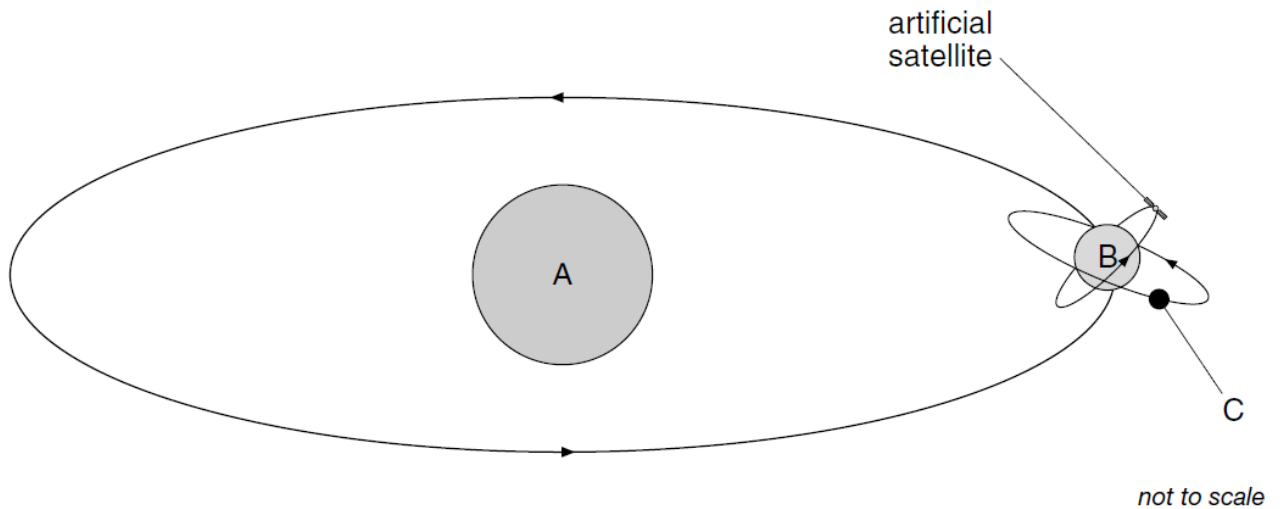
Explanation 2:

_____ [2]

Total: 10 marks

This question is about Space and Electricity

2. The diagram below shows the Earth, the Sun, the Moon and an artificial satellite.



a. Which letters, on the diagram, show the Earth, the Sun and the Moon?

the Earth _____

the Sun _____

the Moon _____

[1]

b. Suggest **one** use of a satellite.

_____ . [1]

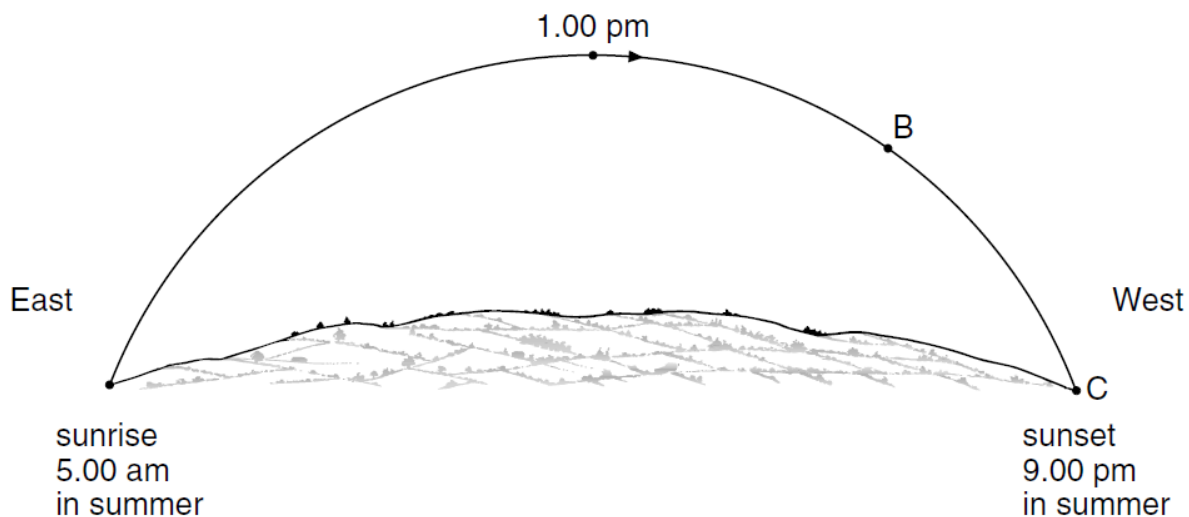
c. Which of the following is a source of light?

Tick the correct box.

	Tick correct answer
the Earth	
the Sun	
a satellite	
the Moon	

[1]

- d. The curve shows the path of the Sun in the sky from sunrise to sunset in England one day in **summer**.



- i. On **the curve** in the diagram above, mark the position of the Sun at 9.00 am. Label this point A.

[1]

- ii. The Sun seemed to move from point B to point C. How many hours did this take?

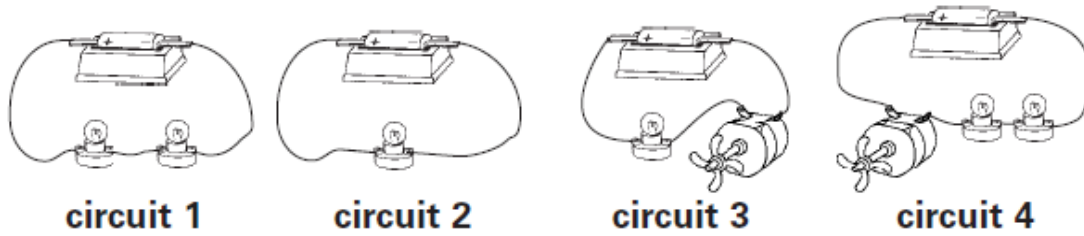
	Tick correct answer
2 hours	
4 hours	
6 hours	
8 hours	

[1]

- e. On **the diagram at the top of the page**, draw the path of the Sun from sunrise to sunset on a day in **winter**.

[1]

f. William decided to investigate how the position and brightness of the sun affects the size and shape of shadows. To do this he made different circuits using the same type of bulbs, motors with fans and cells (batteries).



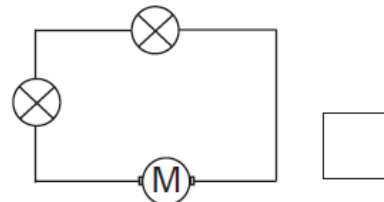
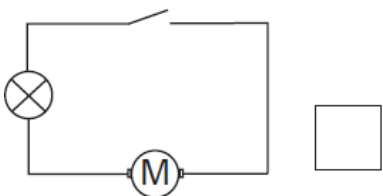
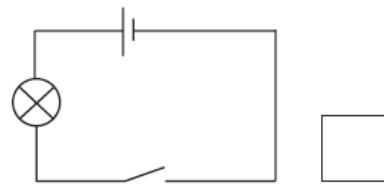
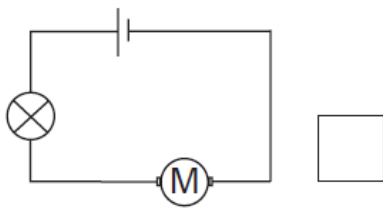
i. In which circuit will the bulb or bulbs be brightest?
 Explain why the circuit you chose has the brightest bulb or bulbs.

Circuit:

Explanation:

[2]

ii. Tick **ONE** box to show which circuit diagram below is correct for circuit 3.



[1]

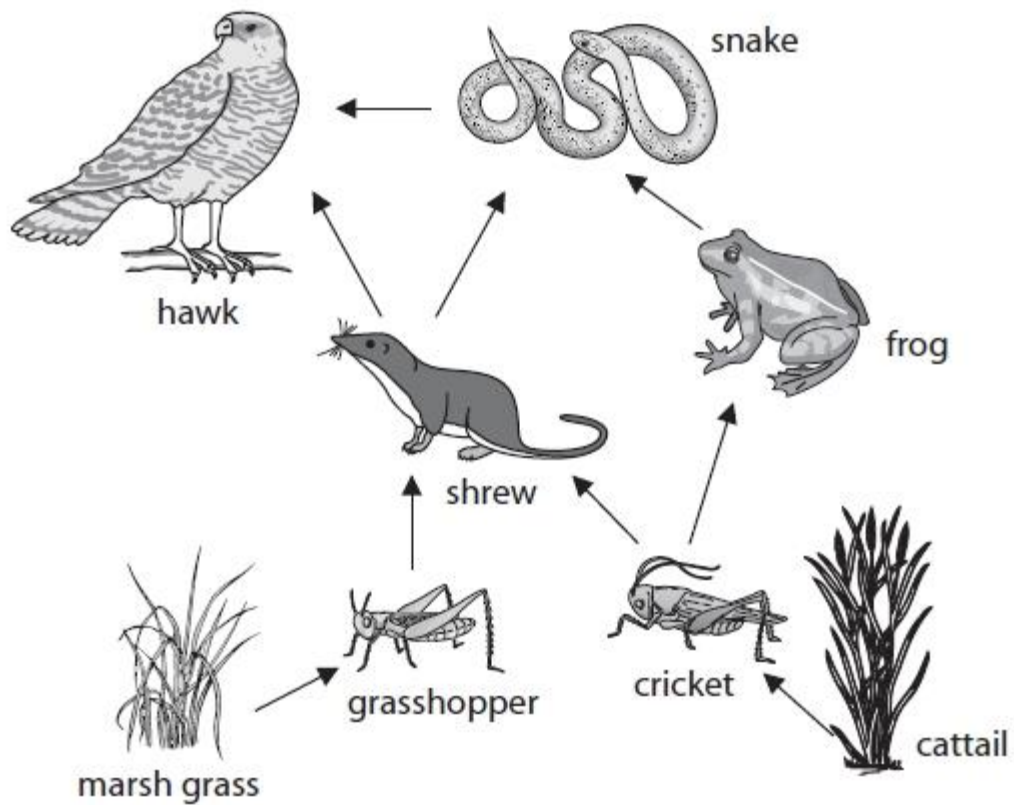
iii. Each of the circuits made has one cell. Explain the effect on the bulbs of adding a second cell to circuit 1.

[1]

Total: 10 marks

This question is about Food Chains

3. The diagram shows a food web from a habitat.



- a. Use information in the food web to complete the table.
The first one has been done for you.

number of organisms	8
number of different types of plant	
number of animals	
number of primary consumers	
number of food chains	

b.

i. What does an arrow mean when used in a food chain?

_____ [1]

ii. What is the name of the place where a plant or an animal lives?

_____ [1]

c.

i. The plants in this food web make the food for some of the animals to eat.
Give the name used to describe these plants.

_____ [1]

ii. The hawk catches and eats its prey.

Give the name used to describe the hawk in this food web.

_____ [1]

d. A pesticide can be used to kill the grasshoppers in this habitat.

i. Describe the effect that killing grasshoppers would have on the number of shrews.

_____ [1]

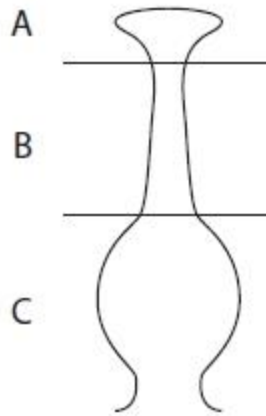
ii. Describe the effect that killing grasshoppers would have on the number of marsh grass plants.

_____ [1]

Total: 10 marks

This question is about Reproduction in Plants

4. The drawing shows part of a flower involved in sexual reproduction. The drawing has been separated into three sections A, B and C.

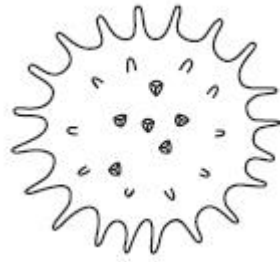


- a. Complete the table by giving the correct letter for the section that matches each statement.
 Each letter may be used once, more than once or not at all.
 The first one has been done for you.

Statement	Section letter
This is the stigma	A
This is where fertilisation occurs	
This is where the pollen grains land at pollination	
This is where most pollen tube growth occurs	
This is where the seed will develop	

[4]

- b. The drawing shows a pollen grain from an insect-pollinated flower as seen using a microscope.



Suggest how the structure of this pollen grain shows it is from an insect-pollinated flower.

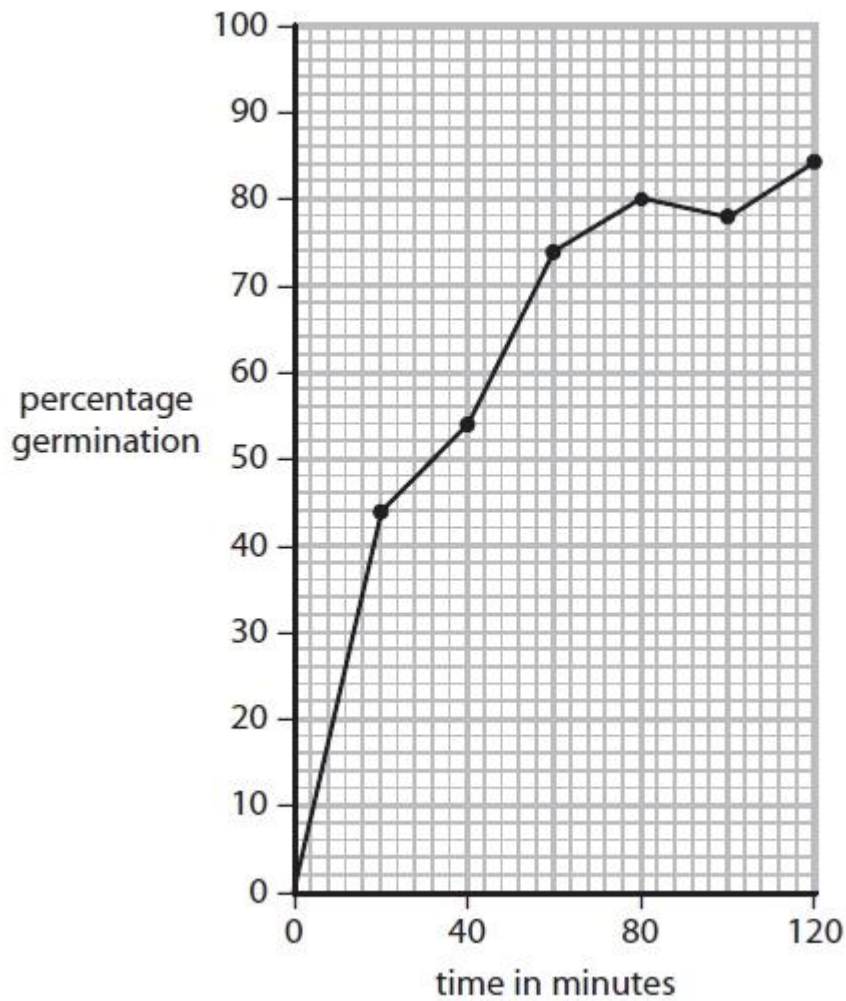
[2]

- c. Pollen grains were placed in a solution that helps them to germinate (grow a pollen tube).

A microscope was used to observe the pollen grains for two hours.

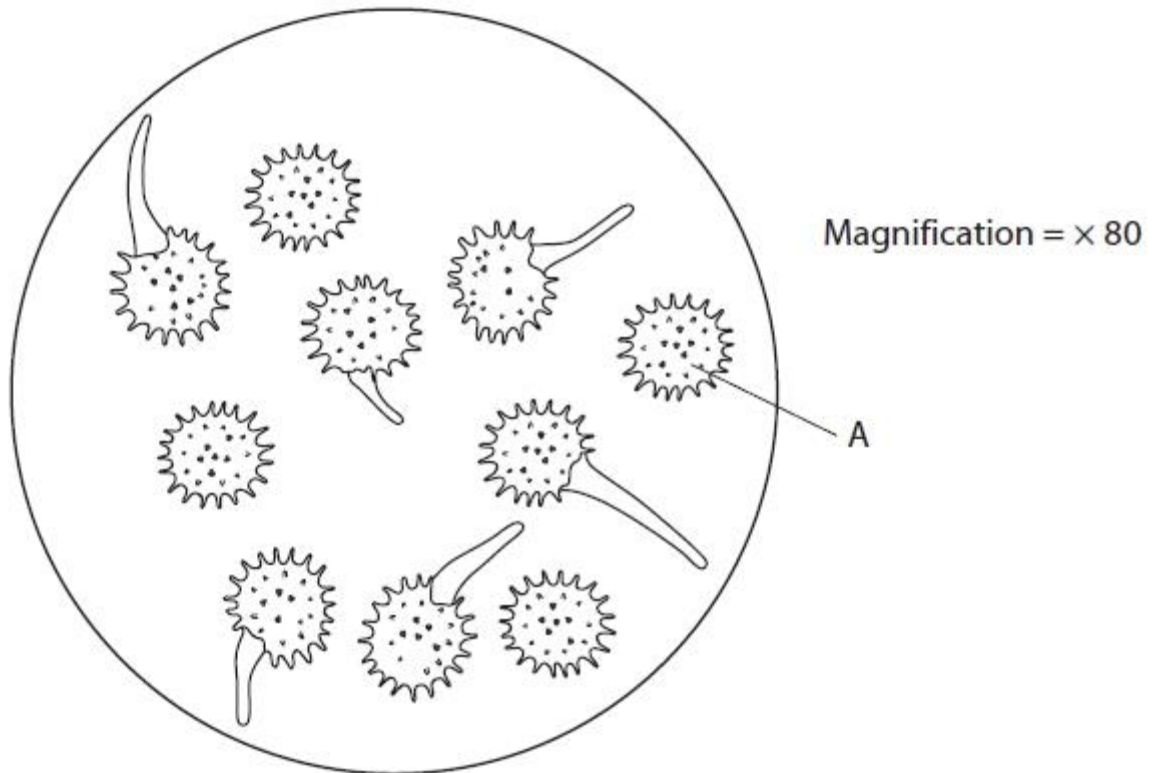
The percentage of pollen grains that had started to germinate was measured during the two-hour period.

The graph shows the results.



- i. Describe how the percentage germination changed during the two-hour period.

- ii. The drawing shows pollen grains seen using the microscope at one time during the two hours.



Use the drawing and the graph to determine the time when these pollen grains were observed.
Show your working.

Answer minutes [2]

Total: 10 marks

This question is about States

5. Imagine that you have recently returned from a trip around the world, and you have noted a few curious things.

You noticed that in China, much like in Britain, they prefer to drink hot tea.

However, in the southern United States, you observed people drinking iced tea.

Both types of tea drinkers would like to sweeten their drinks with sugar cubes.

- a. In which kind of tea will the sugar cubes dissolve more quickly?

_____ [1]

- b. Name two other things the tea drinkers could do to help their sugar cubes to dissolve.

1. _____

2. _____ . [2]

- c. Is dissolving sugar in tea a reversible or irreversible change?

_____ [1]

You also travelled to the Middle East, where it was very hot. The heat caused the water vapour in the air to turn to liquid on your skin.

- d. What is this state change called?

_____ [1]

You decided to cool off by visiting the Dead Sea - known for its very salty seawater. While at the beach, you scooped some seawater and sand into a glass jar to bring home as a souvenir.

- e. Is sand soluble or insoluble in water?

_____ [1]

You have brought your jar to school to show your classmates and want to show everyone how much salt there is in the water. Your teacher provides you with some filter paper, a funnel, and a beaker.

- f. Draw a labelled diagram to show the equipment set up so that you would use it to separate the sand from the seawater.

[2]

- g. The substance that stays on the filter paper is called the **residue**; the substance that passes through the filter paper is called the **filtrate**.
Circle which substance is in the filtrate.

Salt Sand

[1]

- h. Suggest one way you could recover the pure solid from your filtrate.

_____ [1]

Total: 10 marks