Time allowed: 60 minutes **Maximum marks : 60 marks**

Answer in the spaces provided.

1. In the garden

(a) Fiona is in the garden. She wonders how she can find out the names of some of the plants.

Tick **ONE** box to show how Fiona could find out the names of the plants.

Fiona could use a...

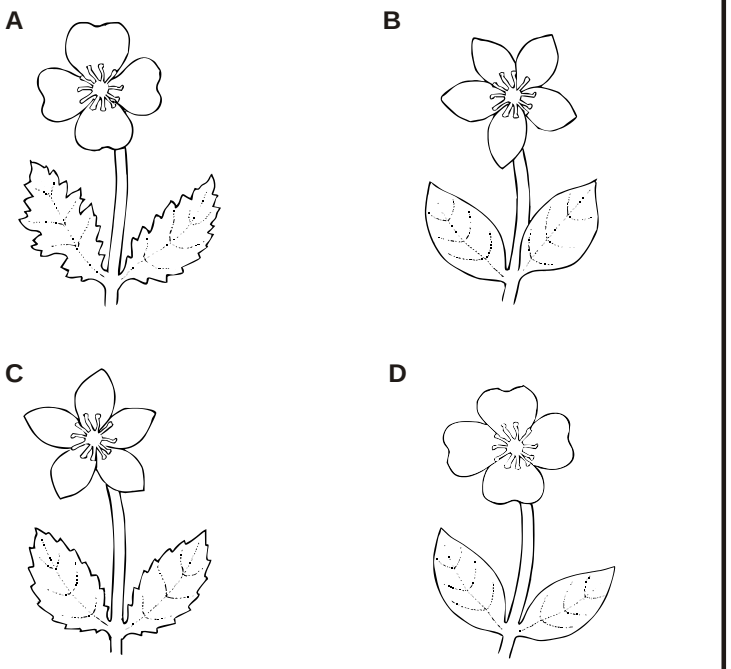
food chain. ☐ producer. ☐

fair test. ☐ key. ☐

1 mark

(b) Fiona sorts the plants into groups to help her find out their names.
The plants in one of her groups all have yellow flowers.

Plants with yellow flowers



Look at the group of plants with yellow flowers.
Fiona needs to sort these plants into two groups.

(i) Suggest a way these plants with yellow flowers could be sorted into two groups.

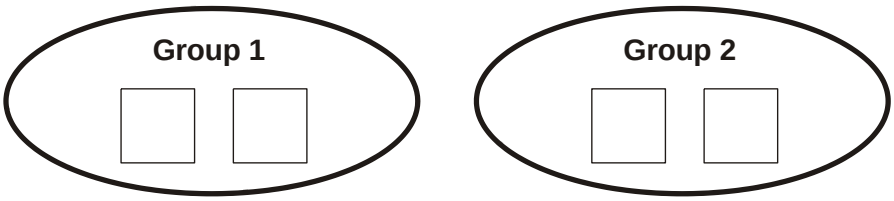
Group 1: Plants with yellow flowers and .....

.....

Group 2: Plants with yellow flowers and .....

.....

(ii) Write **A**, **B**, **C** or **D** in each box below to show how Fiona should sort the plants with yellow flowers into the two groups you gave above.



2 marks

(c) Scientists sort plants into groups.
Tick **ONE** box to show why it is a good idea.

- to compare plants with animals ☐
- to see if a plant is a living thing ☐
- in case a plant dies ☐
- because there are many types of plant ☐

1 mark

2. Growing beans

(a) Ann and Jake investigate how beans germinate and grow.
They each put a bean seed in a jar with paper.
They observe their bean seeds for 12 days.
Ann does **not** water her bean seed.

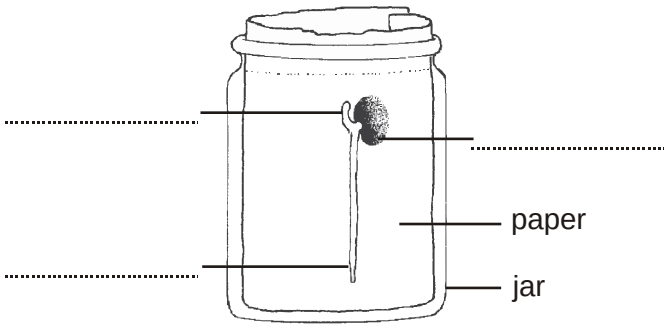
Tick **ONE** box to predict how long the root and shoot of Ann's seed will be if she **never** waters it.

Length of root: 1cm Length of shoot: 4cm	☐	Length of root: 0cm Length of shoot: 4cm	☐
Length of root: 4cm Length of shoot: 1cm	☐	Length of root: 0cm Length of shoot: 0cm	☐

1 mark

(b) Jake waters his bean seed every day.

Label the diagram of Jake's bean. Write **root**, **shoot** and **seed**.



Jake's bean

1 mark

(c) Jake measures the lengths of the root and shoot and records these in a table.

Day	2	4	6	8	10	12
Length of root (cm)	0	0	2.5	6.6	10.2	13.0
Length of shoot (cm)	0	0	0	0	1.4	5.0

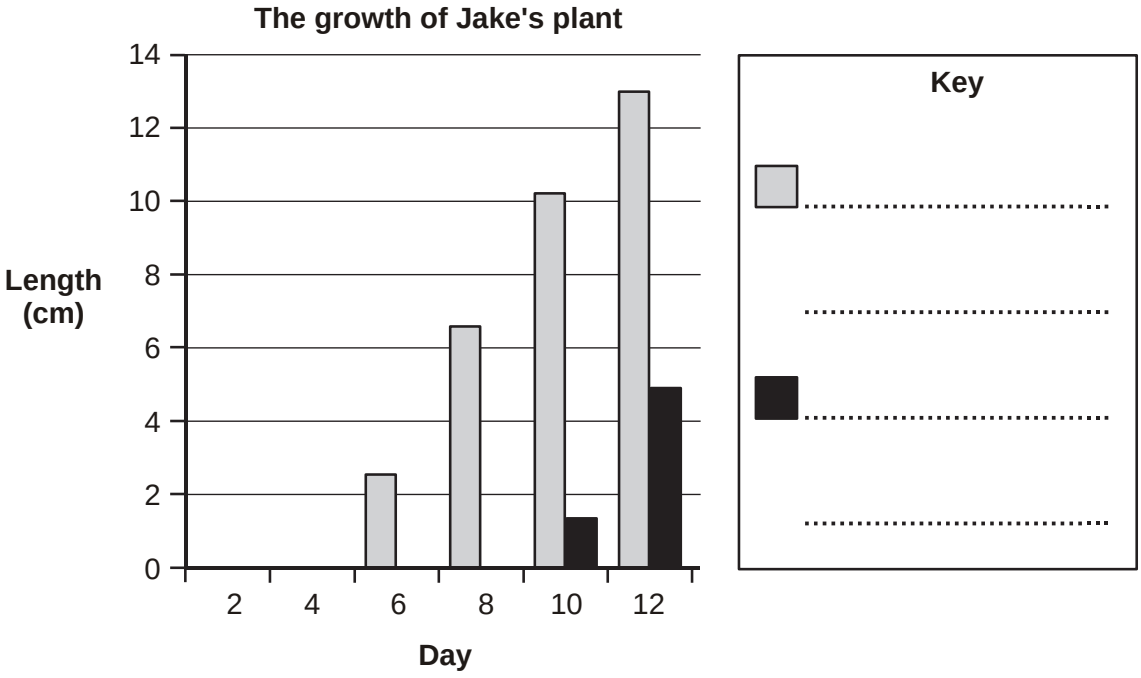
On which day did Jake **record** that his bean seed had germinated?

.....

1 mark

(d) Jake uses the information from his table to draw a bar graph.

Use the table to complete Jake's key to show what the grey and black bars on the graph mean.



1 mark

(e) Jake puts his plant in soil.
After a few weeks, there is a flower on Jake's plant.

Tick **ONE** box to show the **next stage** in the life cycle of Jake's plant.

seed dispersal	☐	fruit production	☐
seed production	☐	pollination	☐

1 mark

3. Bones

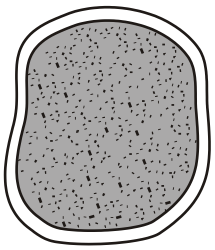
(a) A human skeleton is made up of bones.

Tick **ONE** box to show the main life process for which bones are important.

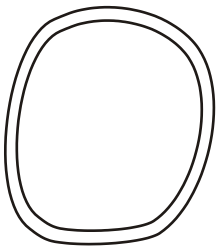
breathing	☐	nutrition	☐
movement	☐	reproduction	☐

1 mark

(b) Birds also have a skeleton. The diagrams below show a human bone and a bird bone cut in half.



Human bone



Bird bone

The bird bone is hollow (filled with air) inside. This makes it easier for the bird to fly.

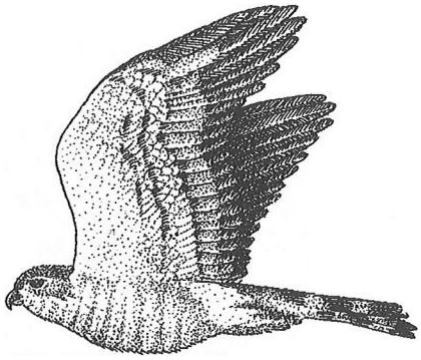
Why do hollow bones make it easier for birds to fly?

.....

1 mark

(c) This bird eats only meat.

Meat is all it needs for its bones to stay strong.



If humans ate only meat, their bones would not stay strong.

Tick **ONE** box to show what is best for humans to eat to keep their bones strong.

all food without fat	☐	only fruit and vegetables	☐
Any food that tastes good	☐	a balanced diet	☐

1 mark

(d) Describe a **different** way humans can keep their bones strong.

.....

1 mark

4. The heart

(a) Denise uses a stethoscope.
She listens to Joe's heartbeat before Joe exercises.

As soon as Joe stops exercising, Denise listens again. Joe's heartbeat is louder.

Describe one other change in Joe's heartbeat straight after exercise compared with before exercise.

..... 1 mark

(b) Denise and Joe collect information from four adults. The table shows what they find out.

Adult	Exercises regularly	Eats a balanced diet	Smokes regularly	Cleans teeth regularly
A	✗	✗	✓	✗
B	✓	✓	✗	✗
C	✓	✓	✗	✓
D	✓	✗	✓	✓

Which **TWO** adults are most likely to have healthy hearts?

Write **A**, **B**, **C**, or **D**.

..... and ..... 1 mark

5. Making soup

(a) Fahim is making some soup.

He measures some cold water into a glass measuring jug.

Glass is a good material for a measuring jug, even though glass can break easily.

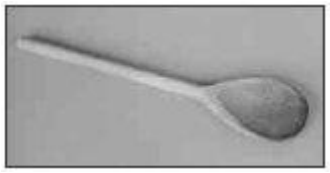
Why is glass a good material for a measuring jug?

.....

1 mark

(b) Fahim cuts some vegetables. He puts them into a saucepan.
He adds the water to make soup.

He uses a wooden spoon to stir the soup while it cooks.



Why is wood a good material for the spoon that Fahim uses to stir the hot soup?

Tick **ONE** box.

It gets hot. ☐

It conducts heat away from his hand. ☐

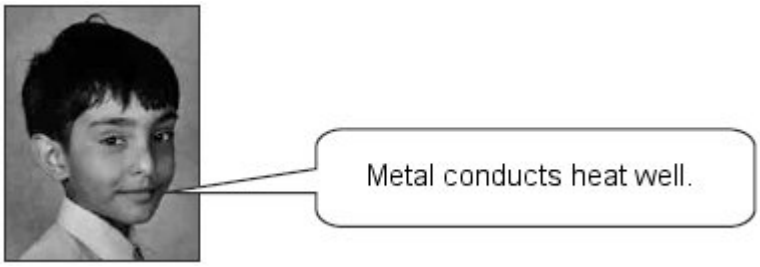
It insulates his hand from the heat. ☐

It absorbs hot water. ☐

1 mark

(c) Fahim cooks the soup in a metal saucepan.

Fahim gives one reason why saucepans are made from metal, not plastic:



Give **ONE other** reason why saucepans are usually made from metal and **not** from plastic.

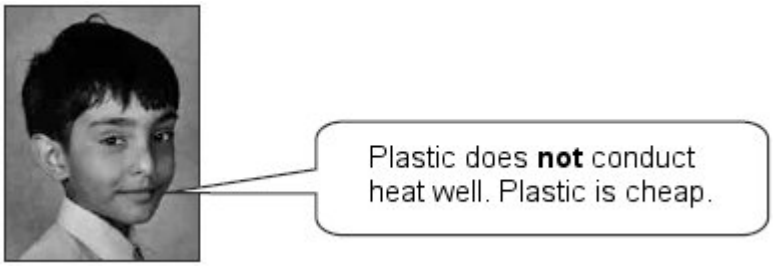
.....

.....

1 mark

(d) Fahim washes up his cooking things.
His washing-up bowl is made from plastic.

He gives two reasons why washing-up bowls are made of plastic:



Give **ONE other** reason why plastic is a good material for a washing-up bowl.

.....

.....

1 mark

6. Solids, liquids and gases

(a) Megan has three cups.
There is a solid in one cup, liquid in another, and gas in another.

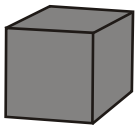
Megan writes a description of what is in each cup.

Draw **THREE** lines to match solid, liquid and gas to the best description of what is in each cup.

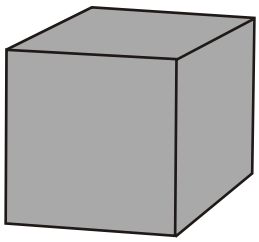
	Description
solid	I cannot see anything inside the cup.
liquid	I cannot pour the material out of the cup.
gas	When I move the cup, the material changes shape.

1 mark

(b) Megan's teacher says gases spread out to completely fill up any container.



A small container of gas.



All of the gas from the small container can fill up a big container.

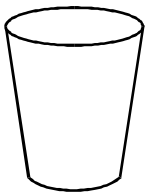
Write **yes** or **no** in each row to complete the table.

	Do they spread out to **completely fill up** any container?
Gases	yes
Liquids	
Solids	

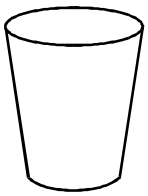
1 mark

7. Measuring temperature

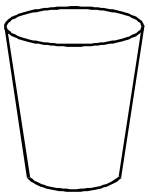
(a) Some children want to find out which material keeps a drink hottest. They fill three cups with hot water.



metal cup



polystyrene cup



plastic cup

They measure the temperature of the water. It is the same in each cup.

What equipment do they use to measure the temperature of the water?

.....

1 mark

(b) They leave all the cups in the same place to cool.

What else must the children keep the same for their test to be fair?

Tick **TWO** boxes.

The size of each cup. ☐

The material used to make the cups. ☐

The final temperature of the water. ☐

The volume of hot water in each cup. ☐

1 mark

(c) They measure the temperature again after 20 minutes.

In their test, the polystyrene cup keeps the water hottest.

Write **metal**, **polystyrene** and **plastic** in the correct order in the boxes below, to show how well each insulates heat.

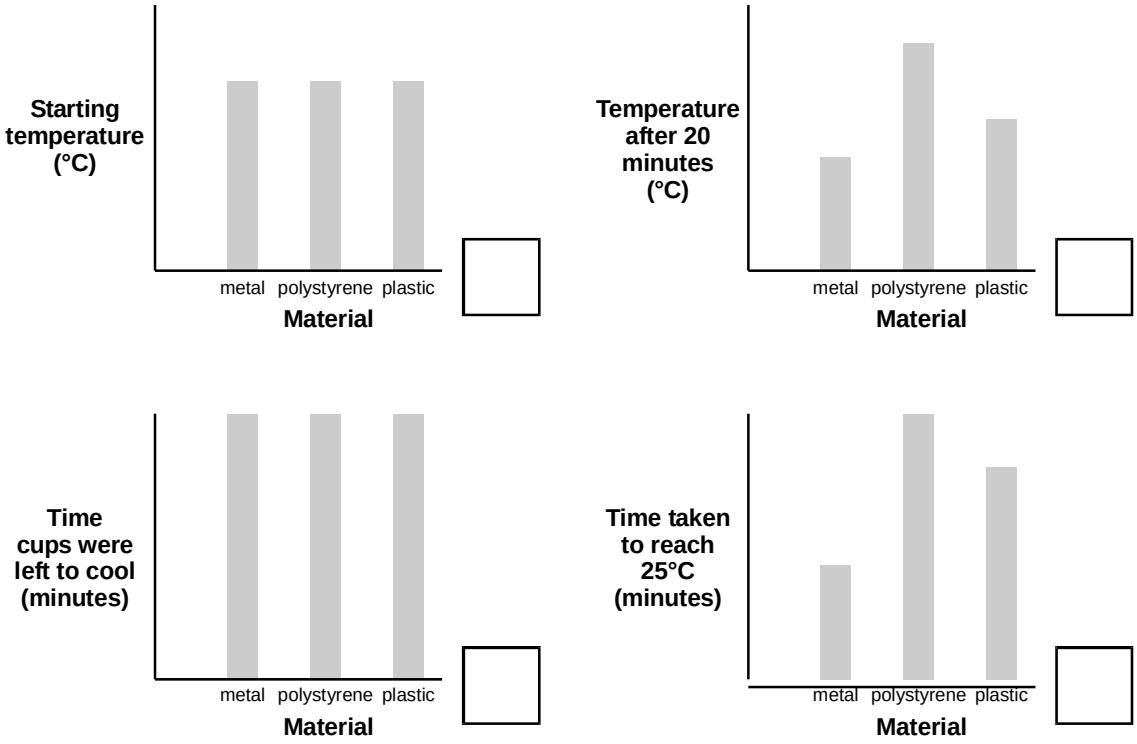
Good insulator of heat ⟷ **Poor insulator of heat**

1 mark

(d) The children want to record their results on a graph.

Which graph would best show the results at the end of **their test**?

Tick **ONE** box.



1 mark

8. Evaporation

(a) Rose knows that water and vinegar evaporate.

Tick **ONE** box to show what **evaporation** means.

Evaporation is the change from...

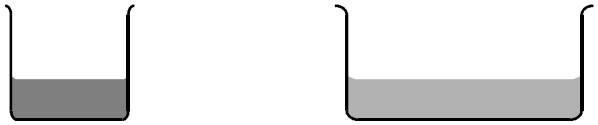
gas to liquid. ☐ gas to solid. ☐

liquid to solid. ☐ liquid to gas. ☐

1 mark

(b) Rose sets up a test to find out if more water or more vinegar evaporates over 3 days.

She puts water in one container and vinegar in another container, like this:



Rose places both containers on the same windowsill.

(i) Use the information above to describe **ONE** thing that is not fair in her test.

.....

1 mark

(ii) Why does it matter if her test is not fair?

.....

.....

1 mark

(c) Rose changes her test to make it fair. She measures the volumes of water and vinegar twice each day to see how much has evaporated.

The table below shows her results.

Day	Time	Volume of water (cm^3)	Volume of vinegar (cm^3)
Monday	10am 3pm	100 99	100 98
Tuesday	10am 3pm	97 94	94 86
Wednesday	10am 3pm	91 89	82 80

Rose wanted to compare water and vinegar to find out which evaporated the most over 3 days.

Use Rose's results to write a conclusion for her test.

.....

.....

1 mark

(d) Rose notices that more water and vinegar evaporated between 10am and 3pm on Tuesday than between the same times on Monday or Wednesday.

Suggest **ONE** possible reason why more water and vinegar evaporated on Tuesday.

.....

1 mark

9. Light sensor

(a) The light in a classroom comes from different sources.

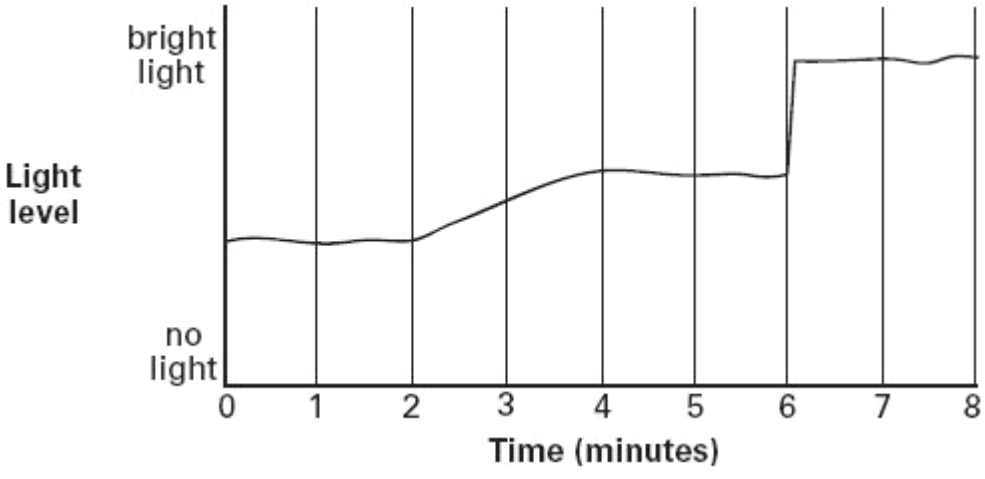
Tick **ONE** box below to show one possible source of light in a classroom.

plant	☐	mirror	☐
radiator	☐	computer screen	☐

1 mark

(b) Some children place a light sensor in the middle of the classroom.

The graph below shows how the light level changed over time.



Describe what happened to the light level between two and four minutes on the graph.

.....

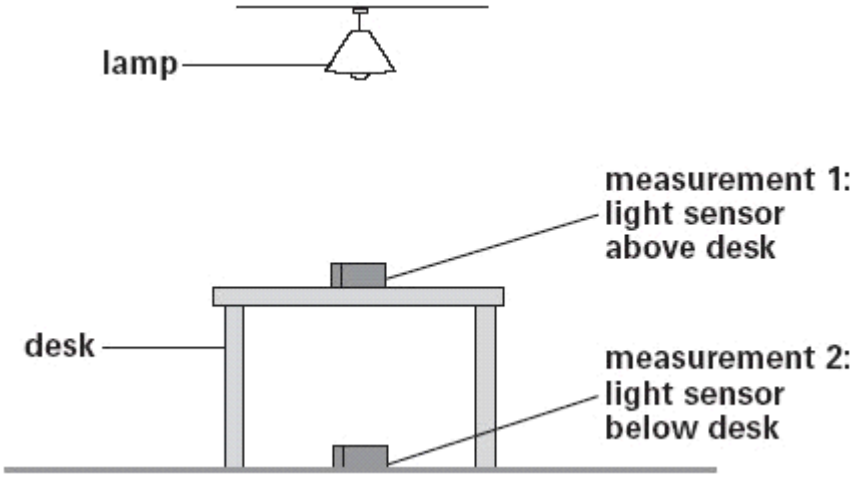
1 mark

(c) Describe **ONE** thing that could have happened in the classroom at six minutes to make the light level suddenly change.

.....

1 mark

(d) The children measure the light above a desk and below a desk.



George says: 'When the light sensor is under the desk, the reading on the sensor goes down.'

Write **true** or **false** next to each sentence below.

	True or **false?**
The light source is above the desk.	.....
The light cannot pass through the desk.	.....
There is a shadow underneath the desk.	.....

1 mark

(e) Complete the sentence using a word from the box below.

impermeable	opaque	transparent	solid

The sensor reading is lower when it is below the desk because

the desk is .....

1 mark

10. Shadows and space

(a) Jimmy stands a pole in the playground.
There is a shadow of the pole on the playground.

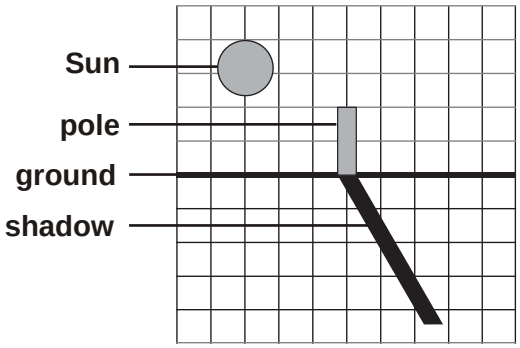
Why does the pole cause a shadow on the playground?

.....

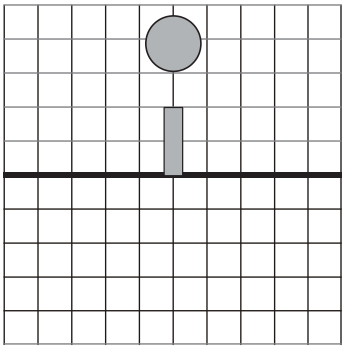
1 mark

(b) Jimmy records the shadow at 10 am.

He draws his results on squared paper.



Draw the shadow of the pole at 12 noon.



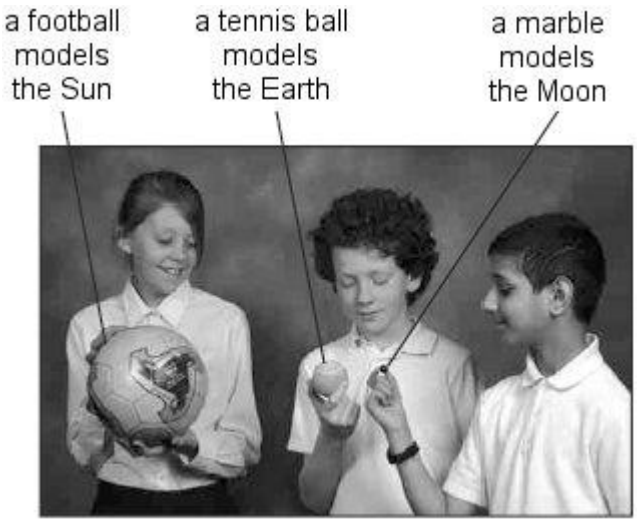
1 mark

(c) Tick **ONE** box to show which movement in space causes the shadows to change on Earth during a day.

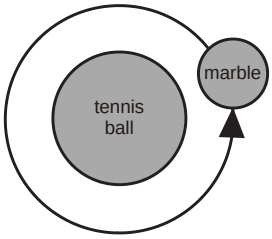
the Sun spinning	☐	the Earth orbiting the Sun	☐
the Earth spinning	☐	the Moon orbiting the Earth	☐

1 mark

(d) Jimmy and his friends use different sized balls to model the Sun, Earth and Moon.



The marble is moved around the tennis ball.



Which movement is modelled by the marble and the tennis ball?
Tick **ONE** box.

the Moon orbiting the Earth	☐	the Earth orbiting the Moon	☐
the Moon spinning on its axis	☐	the Earth spinning on its axis	☐

1 mark

(e) The children use the tennis ball and the football to model an orbit.
This orbit takes one year.

How should the children move the tennis ball and the football to model the orbit that takes one year?

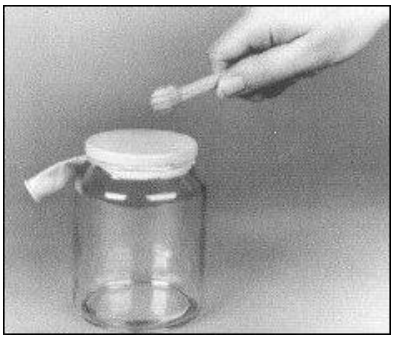
.....

.....

1 mark

11. Sound

(a) Carina makes a drum by stretching a balloon over the top of a jam jar.



She hits the stretched balloon with a beater. It makes a sound.

What does the sound travel through to reach Carina' s ears?

..... 1 mark

(b) She pulls the balloon more tightly over the jar.

This changes the pitch of the sound.

(i) Describe what pitch means.

..... 1 mark

(ii) How does the pitch change when the balloon is tighter?

..... 1 mark

12. (a) Mark is listening to the sound from his radio.

What effect does the sound have on Mark's ear drum?

.....

..... 1 mark

(b) Mark makes his radio play more loudly.

What is the **difference** that this louder sound has on his ear drum?

.....

..... 1 mark

(c) The sound from Mark's radio changes to a lower pitch.

What is the **difference** that this lower pitched sound has on his ear drum?

.....

1 mark

13. Planet Earth

(a) A long time ago, people thought that the Earth was flat.

Now we know that planet Earth is not flat.

What shape is planet Earth?

.....

1 mark

(b) A long time ago, scientists had different ideas about the Sun and the Earth.

Now we know that only some of their ideas are true.

Tick ONE box in each row on the table below to say whether each idea is true or false.

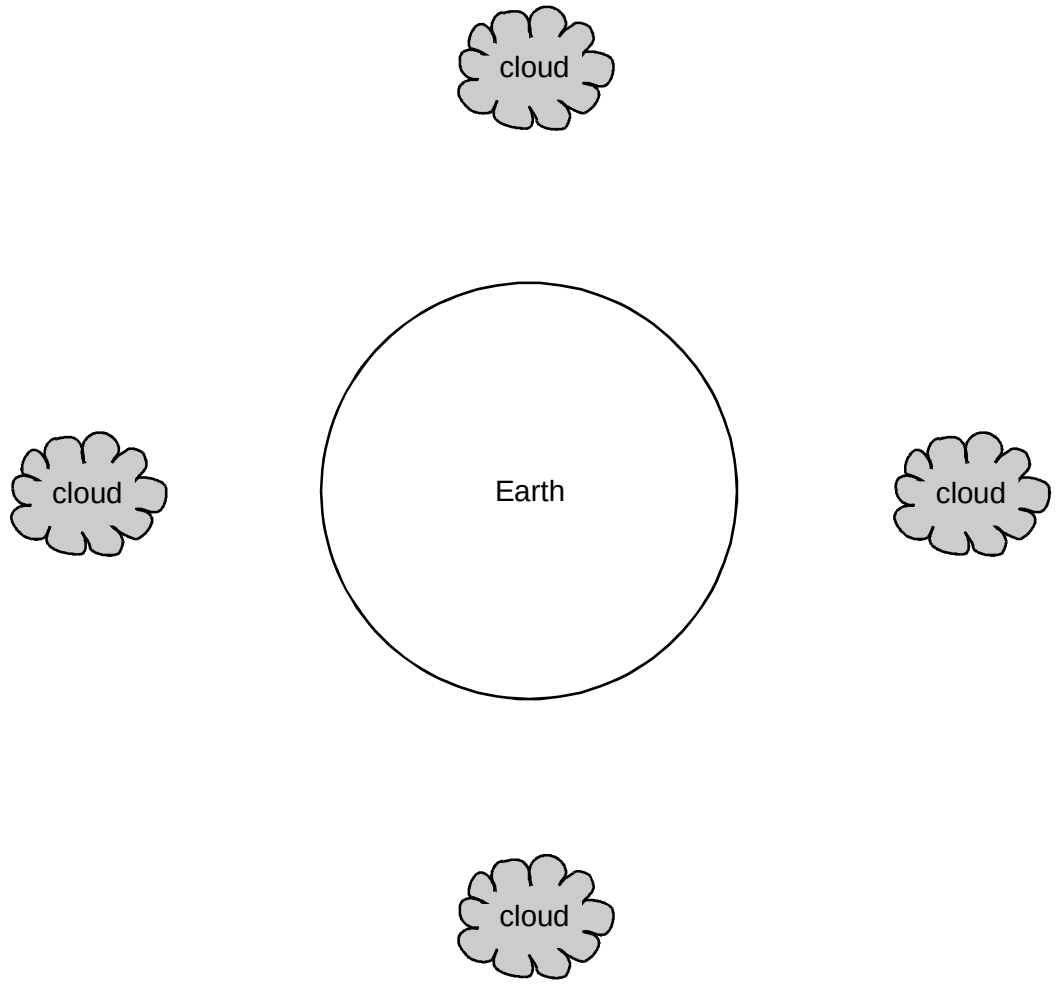
Idea	True	False
The Earth goes around the Sun.		
The Earth spins on its axis.		
The Sun is hidden behind the Moon at night.		
The Sun orbits the Earth.		
Night is dark because thick clouds cover the Sun.		

2 marks

(c) The diagram below shows clouds over different parts of the Earth.

Rain is falling from the clouds.

(ii) Draw an arrow from each cloud to show the direction of gravity acting on the rain.



1 mark

(ii) Explain why you have drawn the arrows in this way.

In your answer write about the force of gravity.

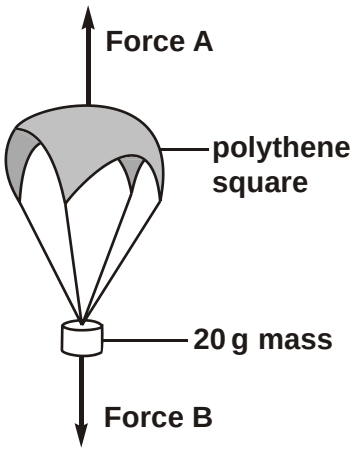
.....

.....

1 mark

14. Parachutes

(a) James makes a parachute out of a square piece of polythene. He attaches it to a 20 g mass.



He drops the parachute. The main forces acting on the parachute are shown in this diagram.

What is the name of force A?

.....

1 mark

(b) James and Aneesa make three more parachutes using different sizes of polythene squares.
They attach a 20 g mass to each parachute.
They drop all four parachutes from the same height.
They record the time taken for each parachute to fall to the ground.

Area of parachute (cm^2)	Time taken to fall (seconds)
9	1.7
16	2.4
25	3.5
36	5.3

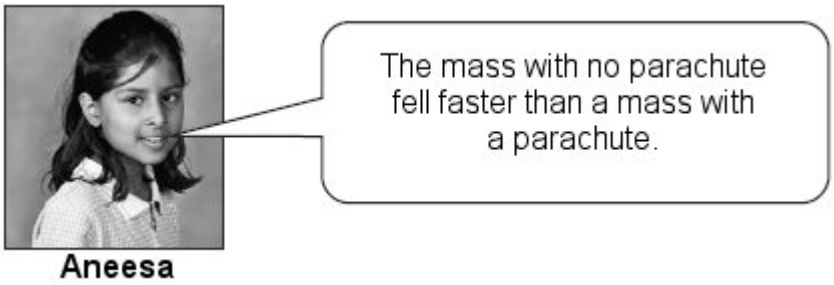
Describe the relationship between the **area of the parachute** and the **time taken** for the parachute to fall to the ground.

.....

.....

1 mark

(c) James drops a 20 g mass from the same height with no parachute.
Aneesa records the time it takes the mass to fall.



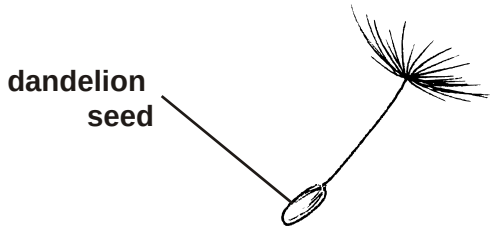
Tick **ONE** box to show why the mass with no parachute fell fastest.

The mass with no parachute...

is heavier.	☐	has less upwards force on it.	☐
is more solid.	☐	has a bigger downwards force on it.	☐

1 mark

(d) In nature, a dandelion seed has a parachute-like structure attached to it.

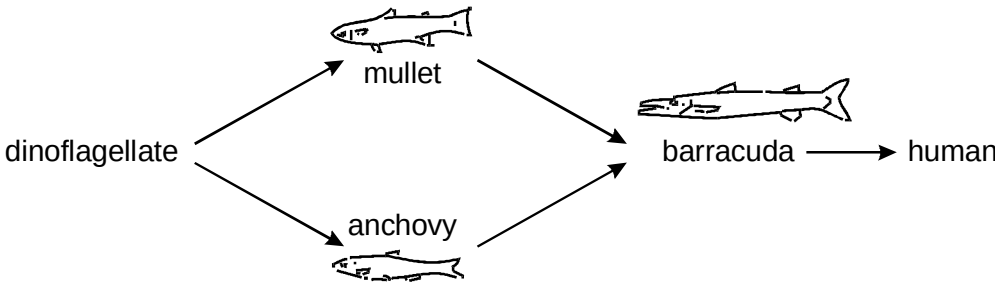


How is the dandelion seed usually dispersed?

.....

1 mark

15. (a) Look at these food chains of living things around a coral reef:



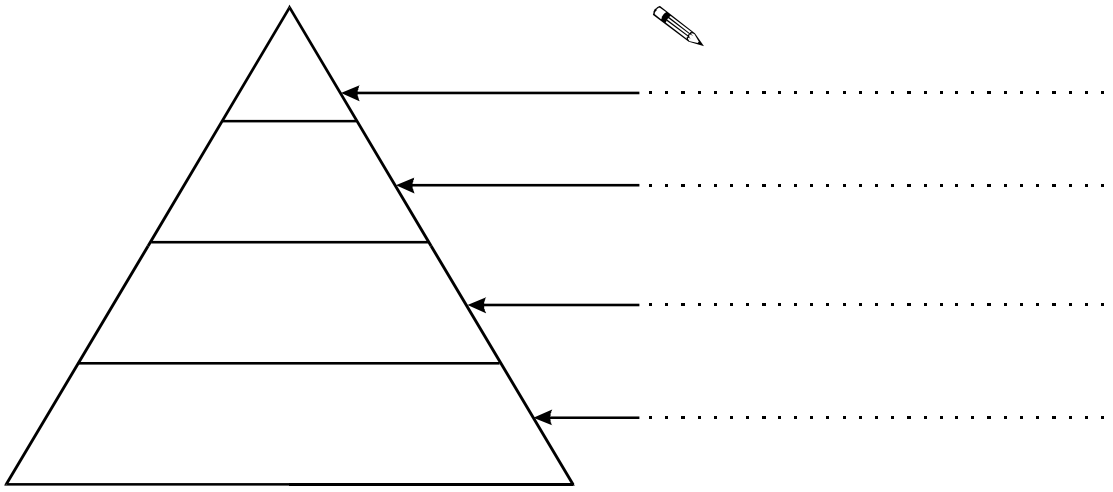
Name the secondary consumer in the food chains above.

.....

1 mark

(b) The pyramid below represents the number of organisms feeding at each level around the coral reef.

Write the name of the correct living thing on each label line below.
Use **ONE** food chain from part (b) to help you.



1 mark

(d) Dinoflagellates can take in harmful chemicals from a polluted ocean.

The amount of harmful chemicals in one dinoflagellate would not kill a human.

Explain why a human eating barracuda from these food chains could take in enough harmful chemicals to be killed.

.....

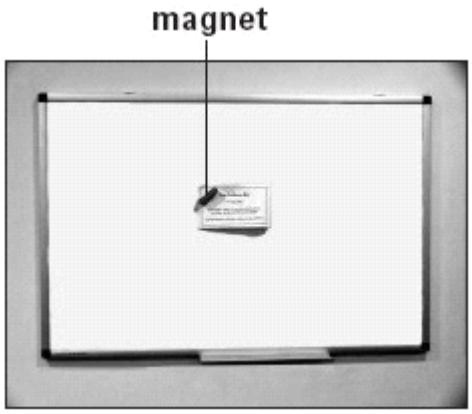
.....

1 mark

16. Magnetic noticeboard

(a) Miya uses a magnet to hold a notice on the noticeboard in her classroom.

The board is coated in white plastic.



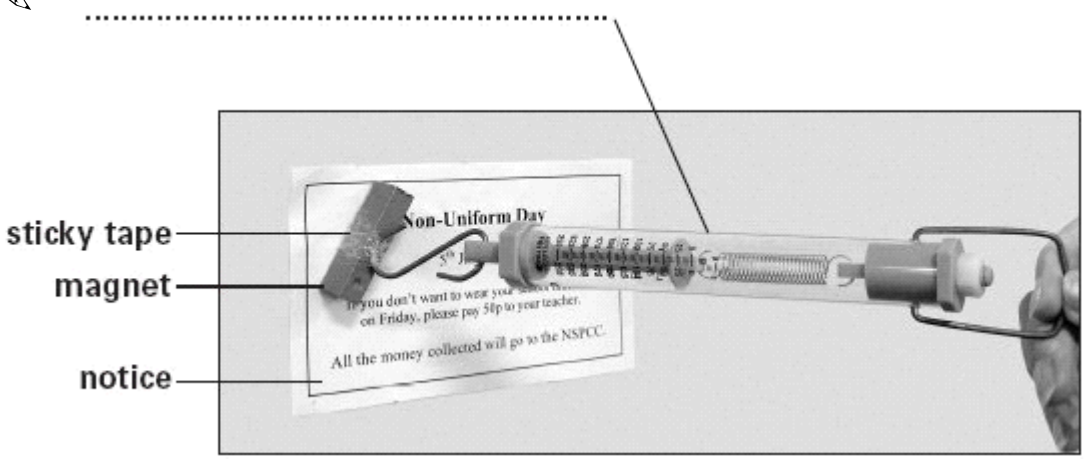
Tick **ONE** box to show which material may be under the plastic coating for the magnet to stick to the board.

steel	☐	paper	☐
wood	☐	cork	☐

1 mark

(b) Miya has four magnets. She wants to measure how much force is needed to pull each magnet away from the board.
The picture below shows how she carries out her test.

Write the label on the picture to name the equipment she uses to measure the force.



1 mark

(c) Miya measured the force for each magnet three times to calculate the average force.

The table below shows her results.

Magnet	Average force needed to pull the magnet away (N)
A	2
B	10
C	5
D	6

Which magnet is the strongest?

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1 mark

(d) Miya observes that as she pulls on the magnet the force reading increases until the magnet comes away from the board.

Tick **ONE** box to show **when** Miya should take the force reading.

before she starts pulling on the magnet	☐	just after she starts pulling on the magnet	☐
just before the magnet pulls away from the board	☐	after the magnet is pulled away from the board	☐

1 mark

(e) Give **ONE** reason why it is better to measure the force for each magnet three times instead of just once.

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1 mark