



General Certificate of Secondary Education
January 2019

Centre Number

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Candidate Number

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Biology

Unit 1
Foundation Tier



[GBY11]

GBY11

MONDAY 14 JANUARY, MORNING

TIME

1 hour 15 minutes.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page or on blank pages.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all twelve** questions.

INFORMATION FOR CANDIDATES

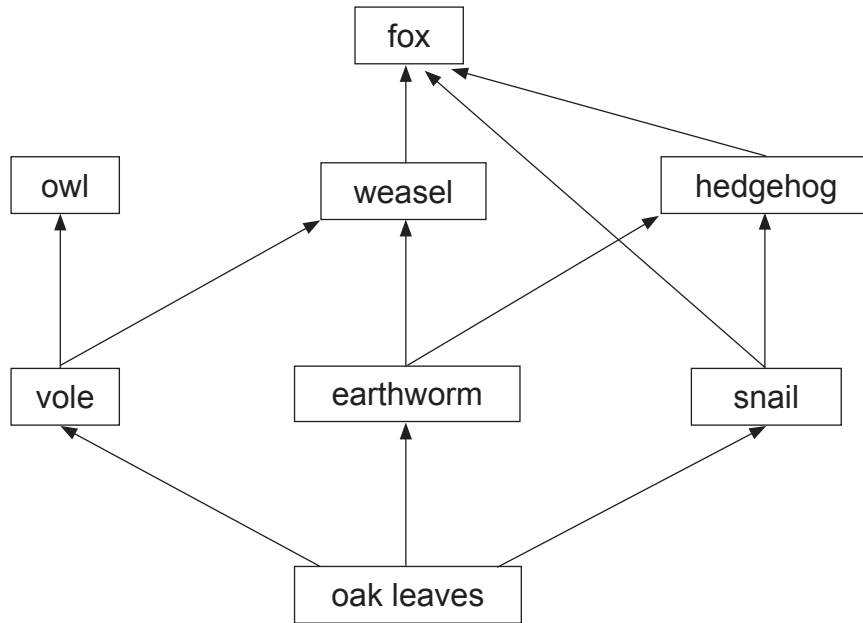
The total mark for this paper is **80**.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question **12**.



1 The diagram shows part of a woodland food web.



Source: Principal Examiner

Look at the diagram.

(a) Complete the food chain from this food web.

	vole		
--	------	--	--

[2]

(b) What is the source of energy for this food web?

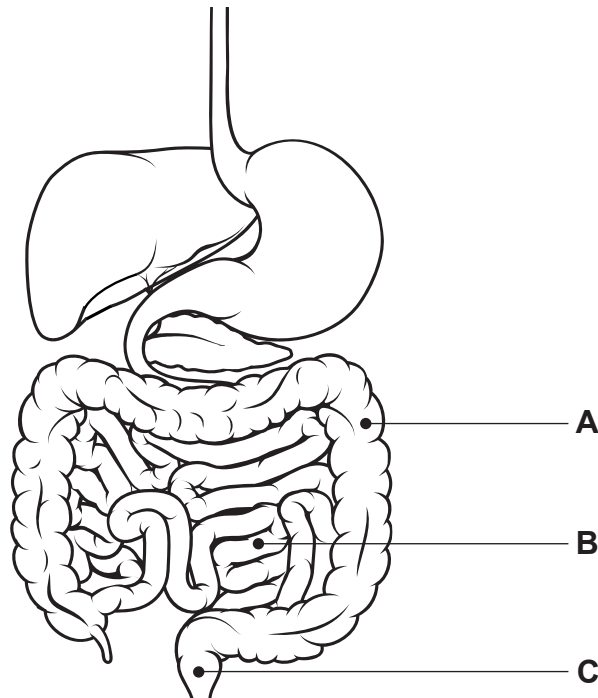
_____ [1]

(c) Name a secondary consumer in this food web.

_____ [1]



2 The diagram shows part of the digestive system.



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Look at the diagram.

(a) Name parts **A**, **B** and **C**.

A _____ [1]

B _____ [1]

C _____ [1]

(b) Draw a line labelled **G** on the diagram to show where gastric juice is produced. [1]

Some people are **not** able to produce enough hydrochloric acid in their stomach.

(c) Suggest what effect this would have on their ability to digest protein.

_____ [1]

[Turn over



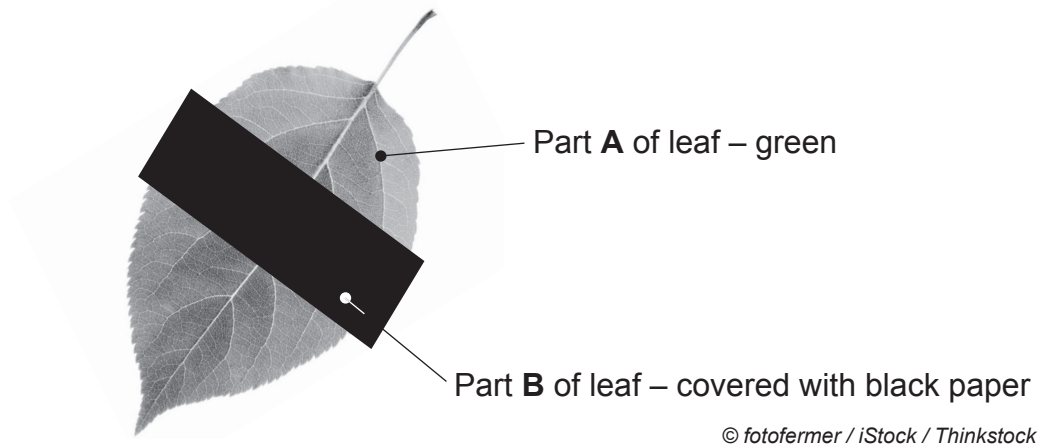
3 A pupil destarched a plant.

(a) Describe how the pupil destarched the plant.

[2]

The pupil used a leaf from the plant to carry out an experiment on photosynthesis.

The diagram shows the leaf.



Look at the diagram.

Several factors are needed for photosynthesis.

(b) Suggest which factor the pupil investigated in this experiment.

[1]



The pupil left the plant in bright light for 24 hours.

He then tested the leaf for starch using iodine solution.

The table shows his results.

Part of leaf	Colour of iodine solution	
	before test	after test
A	yellow/brown	blue/black
B	yellow/brown	yellow/brown

Look at the table.

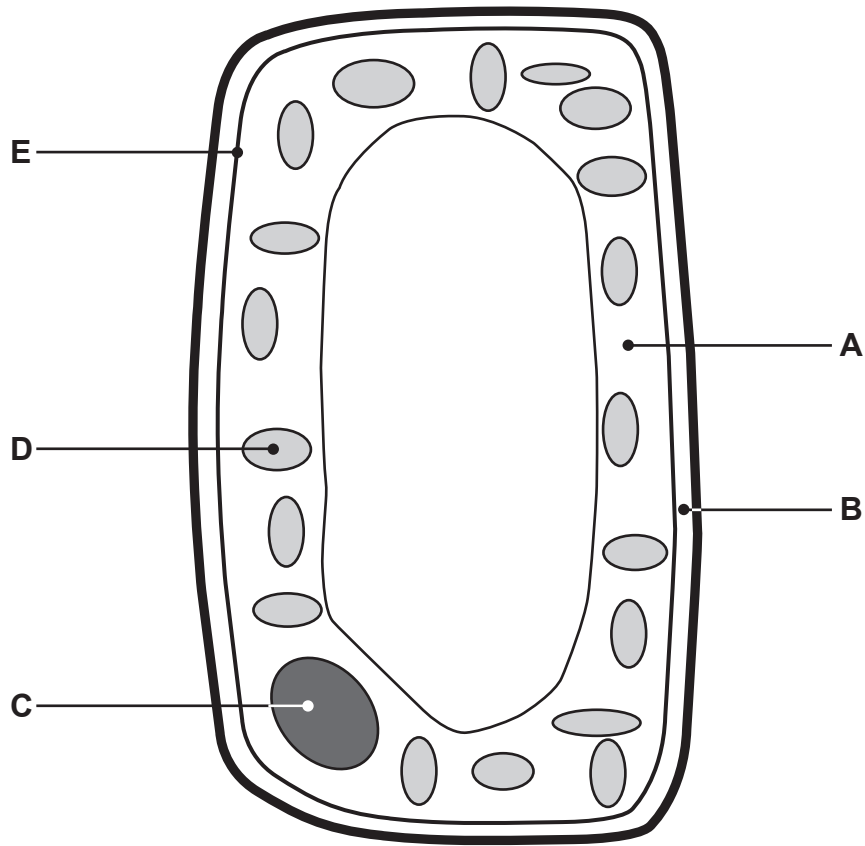
(c) Explain the result for part **B** of the leaf.

Use evidence from the table and the diagram in your answer.

[3]



4 The diagram shows a plant cell.



Source: Chief Examiner

Look at the diagram.

Use the diagram to help complete the table.

Structure	Label	Function
Cytoplasm		
	E	Controls what enters and leaves the cell
Nucleus		
Chloroplast		Site of photosynthesis

[6]



5 The photograph shows emissions from factory chimneys.



© Gudella / iStock / Thinkstock

(a) Name a gas which causes acid rain.

[1]

(b) Use the photograph to help explain how this gas forms acid rain.

[2]

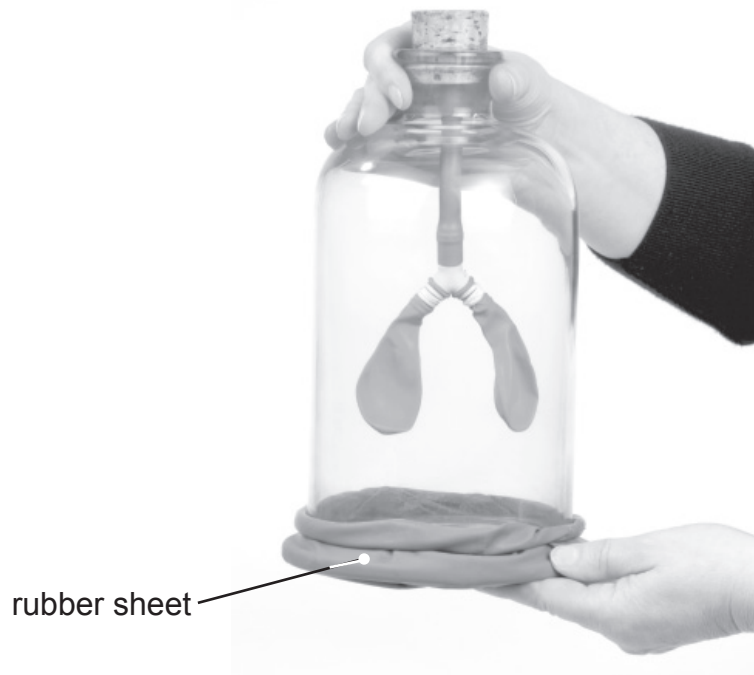
(c) Explain why acid rain is an international problem.

[2]

[Turn over



6 The photograph shows a model of the respiratory system.



© Martyn F. Chillmaid / Science Photo Library

Look at the photograph.

(a) Name the part of the respiratory system which is represented by the rubber sheet.

_____ [1]

(b) Describe and explain what happens to the balloons when the rubber sheet is pulled down.

Description _____ [1]

Explanation _____ [2]



(c) The table shows the percentage of some gases in inhaled and exhaled air.

Gas	Percentage of gas	
	inhaled air	exhaled air
Oxygen	21	16
Carbon dioxide	0.04	4
Nitrogen	78	78

Look at the table.

The percentages of oxygen and carbon dioxide differ in inhaled and exhaled air.

(i) Describe and explain these differences.

Description _____

_____ [2]

Explanation _____

_____ [2]

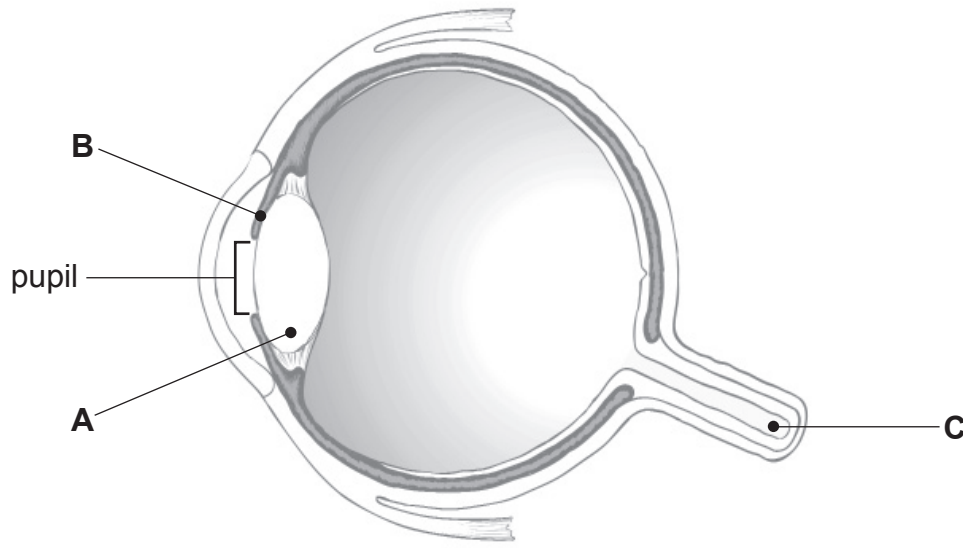
(ii) There is **no difference** in the percentage of nitrogen in inhaled and exhaled air. Explain why.

_____ [1]

[Turn over



7 The diagram shows a section through an eye in dim light.



© Trifonenko / iStock / Thinkstock

Look at the diagram.

(a) Name parts **A**, **B** and **C**.

A _____ [1]

B _____ [1]

C _____ [1]

(b) (i) Describe the change which occurs in the pupil in bright light.

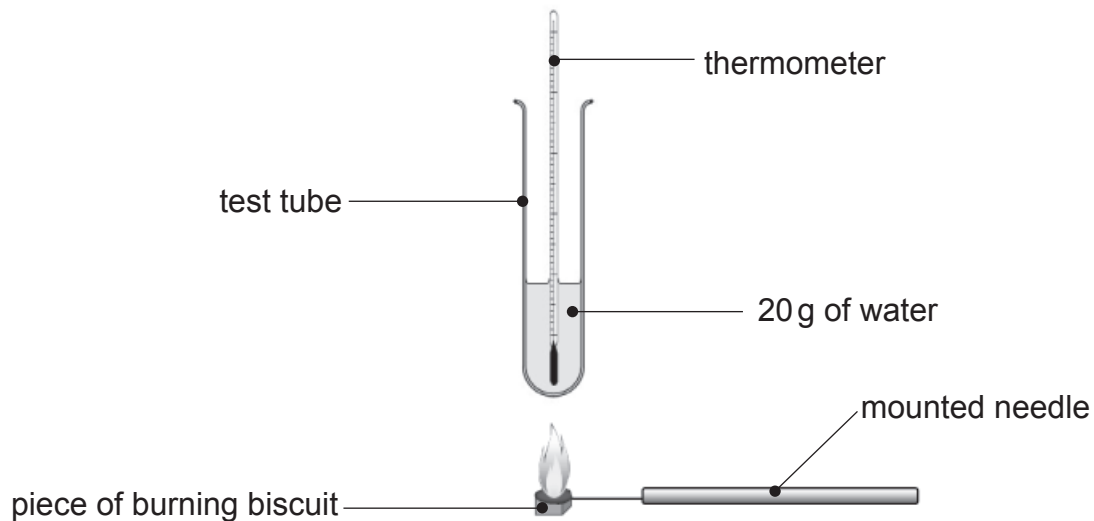
_____ [1]

(ii) Explain why this change is necessary.

_____ [1]



- 8 (a) A student used the apparatus below to measure the energy content of a piece of biscuit.



Source: Chief Examiner

The table shows the results obtained by the student.

Temperature of water/°C	
at start	at end
22	28

The energy content of the piece of biscuit can be calculated using the equation

$$\text{Energy (J)} = \text{mass of water (g)} \times 4.2 \times \text{rise in temperature (}^\circ\text{C)}$$

- (i) Use the equation to calculate the energy content of the piece of biscuit.

Show your working.

_____ J [3]

[Turn over



The energy content calculated by the student was lower than the energy content on the food label for the same mass of biscuit.

(ii) Give **two** reasons why not all the energy in the biscuit was used to heat the water.

1. _____

_____ [1]

2. _____

_____ [1]

The student repeated the experiment with an equal mass of pasta.

She found the energy content of the pasta was less than the biscuit.

The table shows the nutrient content of the biscuit and the pasta.

	Nutrient content/%		
	Carbohydrate	Fat	Protein
Biscuit	71	16	6
Pasta	72	2	7



(iii) Suggest why the energy content of the pasta was less than the biscuit.

Use evidence from the table to support your answer.

[2]

(b) People are advised to monitor their energy intake to maintain a healthy lifestyle.

(i) Give **one** use of energy in the body.

[1]

(ii) Give **two** factors which affect the energy requirements of a person.

1. _____ [1]
2. _____ [1]

People who have an unhealthy diet may become obese.

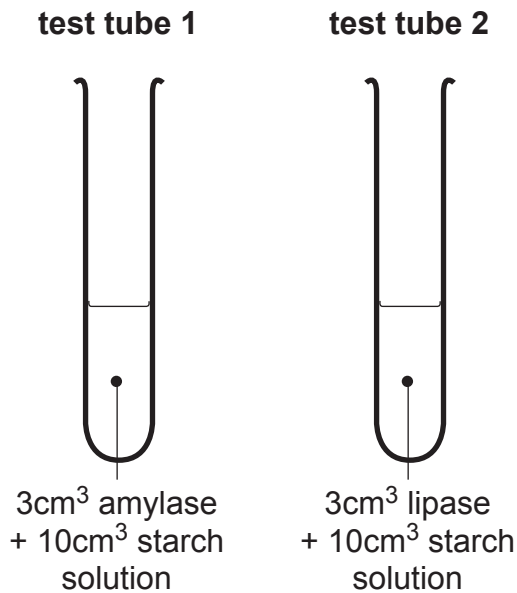
(iii) Give **two other** health problems linked to an unhealthy diet.

1. _____ [1]
2. _____ [1]



- 9 A student carried out an experiment to investigate the action of enzymes on starch solution.

The diagram shows her experiment.



Source: Chief Examiner

Every two minutes a sample was removed from each test tube and tested with iodine solution.

The table shows the colour of the iodine solution when added to a sample after 20 minutes.

Test tube	Colour of iodine solution when added to a sample after 20 minutes
1	yellow/brown
2	blue/black



Look at the table opposite.

(a) Give **two** factors the student controlled in this experiment.

1. _____ [1]

2. _____ [1]

(b) Describe what happened to the starch in test tube 1.

_____ [2]

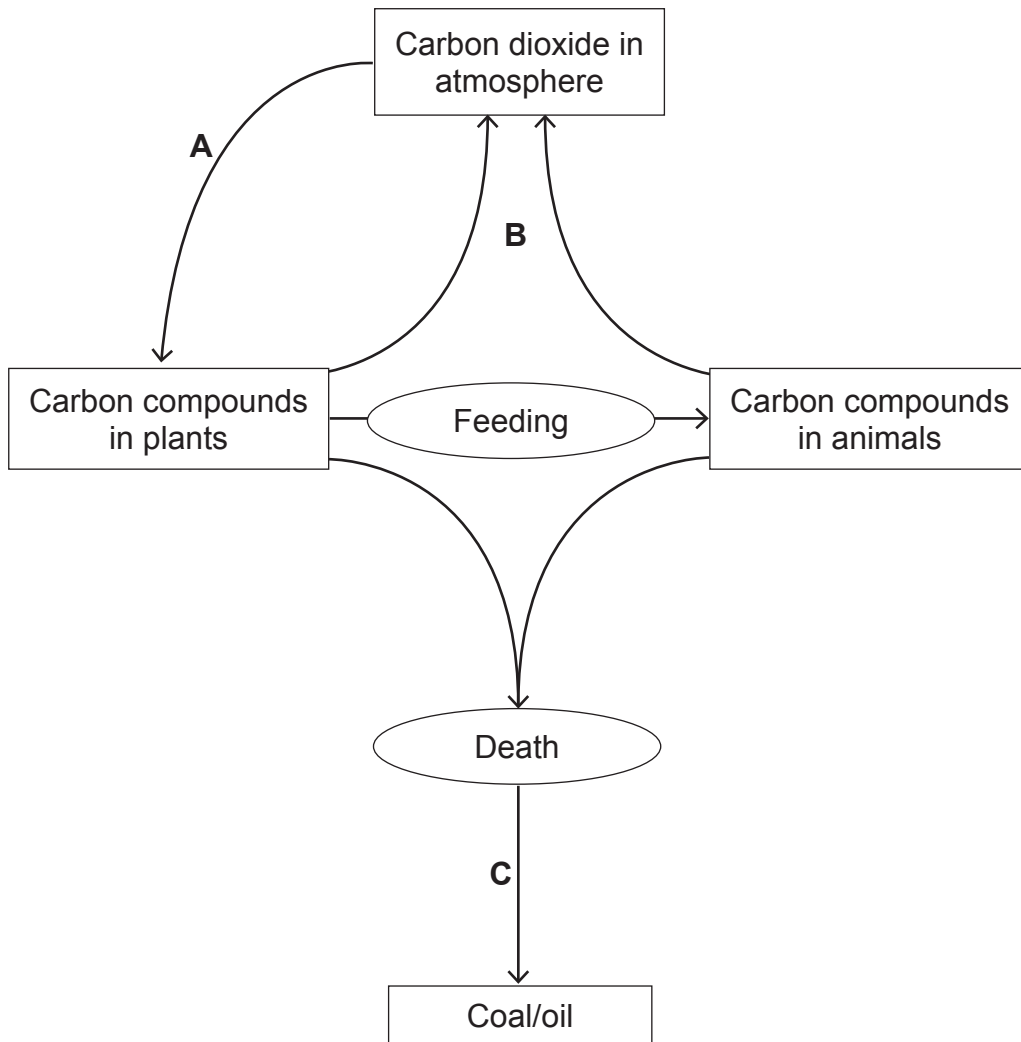
(c) Explain the results for test tube 2 using your knowledge of enzyme action.

_____ [4]

[Turn over



10 The diagram shows part of the carbon cycle.



Source: Principal Examiner

Look at the diagram.

(a) Name processes **A**, **B** and **C**.

A _____ [1]

B _____ [1]

C _____ [1]



(b) The graph shows how the temperature of the Earth and the carbon dioxide concentration in the atmosphere have changed over a five-hundred-year period.

Image removed due to copyright

Look at the graph.

(i) Explain how, after 1910, the graph provides evidence to suggest that carbon dioxide is a major cause of global warming.

[1]

(ii) Suggest **one** reason for the change in carbon dioxide concentration from 1910 to 2000.

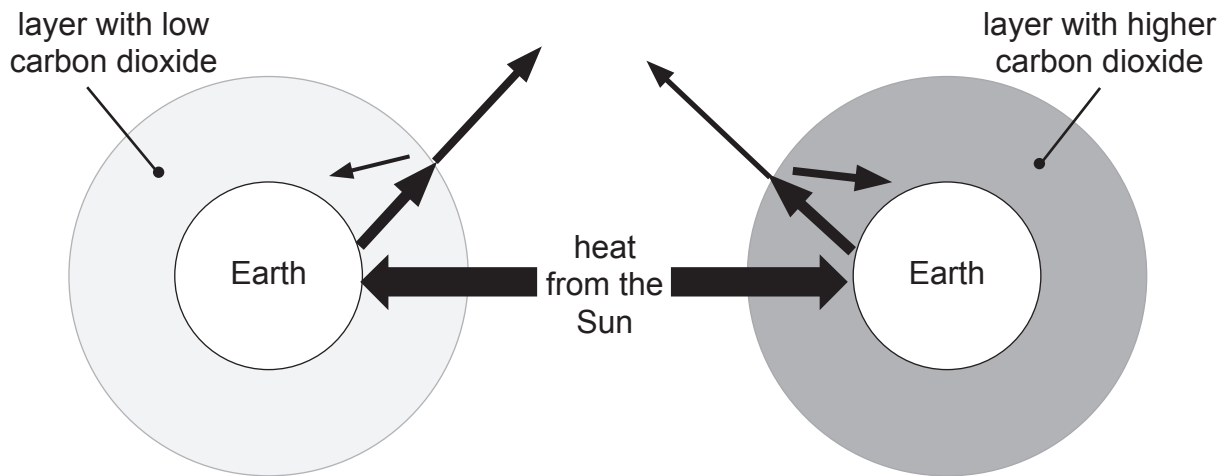
[1]

[Turn over



Carbon dioxide acts as a greenhouse gas.

The diagram shows how carbon dioxide acts as a greenhouse gas.



Source: Principal Examiner

(c) Use the diagram to help explain how a build-up of carbon dioxide in the atmosphere affects the temperature of the Earth.

[3]





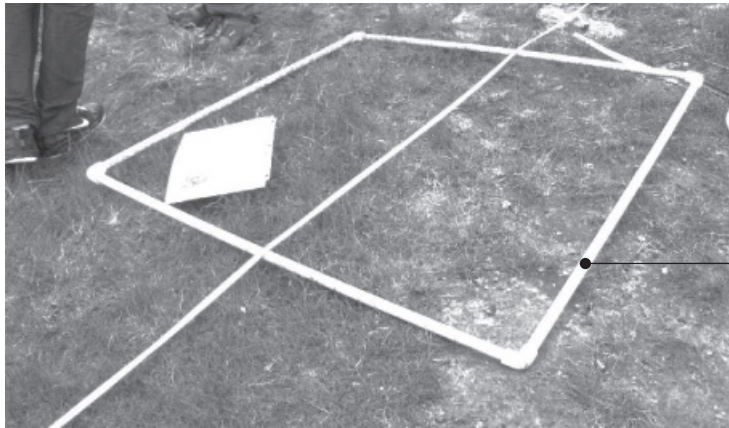
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(Questions continue overleaf)



- 11 The photograph shows apparatus used by a group of students to study the biodiversity of two forests.



apparatus X

Source: Principal Examiner

Look at the photograph.

- (a) Name apparatus X.

[1]

The students estimated the percentage cover of a number of plant species in the two forests.

Table 1 shows their results.

Table 1

Plant species	Percentage cover	
	Forest A	Forest B
Wild garlic	4	43
Ivy	2	39
Bluebells	50	0
Moss	6	0
Buttercups	15	20
Wood Anemone	40	0



Look at Table 1.

The students concluded that forest **A** had greater biodiversity.

(b) Use evidence from Table 1 to explain how they reached this conclusion.

[2]

The students also measured three abiotic factors in the two forests.

Table 2 shows their measurements.

Table 2

Abiotic factor	Forest A	Forest B
Light intensity / arbitrary units	77	11
Soil pH	5.5	5.5
Temperature / °C	15	12

Look at Table 2.

(c) Use evidence from Table 2 to explain **why** forest **A** had greater biodiversity than forest **B**.

[3]

[Turn over





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For Examiner's use only	
Question Number	Marks
1	
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Total Marks	
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Examiner Number

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