



General Certificate of Secondary Education  
2016

Centre Number

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Candidate Number

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# Biology

Unit 1  
Foundation Tier

[GBY11]

FRIDAY 10 JUNE, MORNING

MV18

## Time

1 hour 15 minutes, plus your additional time allowance.

## 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.**

Complete in blue or black ink only.

Answer **all twelve** questions.

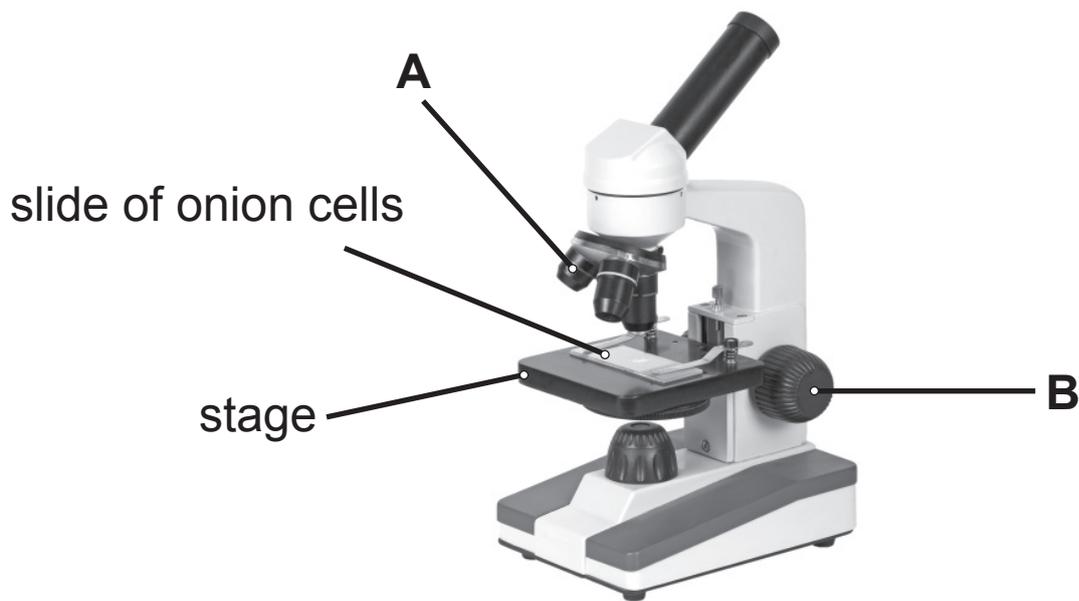
## Information for Candidates

The total mark for this paper is 80.

Figures in brackets printed at the end of each question indicate the marks awarded to each question or part question.

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

1 The photograph shows a light microscope.



Look at the photograph.

(a) Name parts **A** and **B**. [1 mark for each part]

**A** \_\_\_\_\_

**B** \_\_\_\_\_

(b) Name the part of the microscope a student would look through to see the onion cells. [1 mark]

\_\_\_\_\_

(c) While looking through this part of the microscope the student has to focus the microscope.

What happens to the stage as the student focuses the microscope? [1 mark]

\_\_\_\_\_

2 A student tested a biscuit for sugar.

(a) Choose the reagent she used.

Draw a **circle** around the correct answer. [1 mark]

**Biuret**

**Ethanol**

**DCPIP**

**Benedict's**

(b) Describe how she used this reagent. [2 marks]

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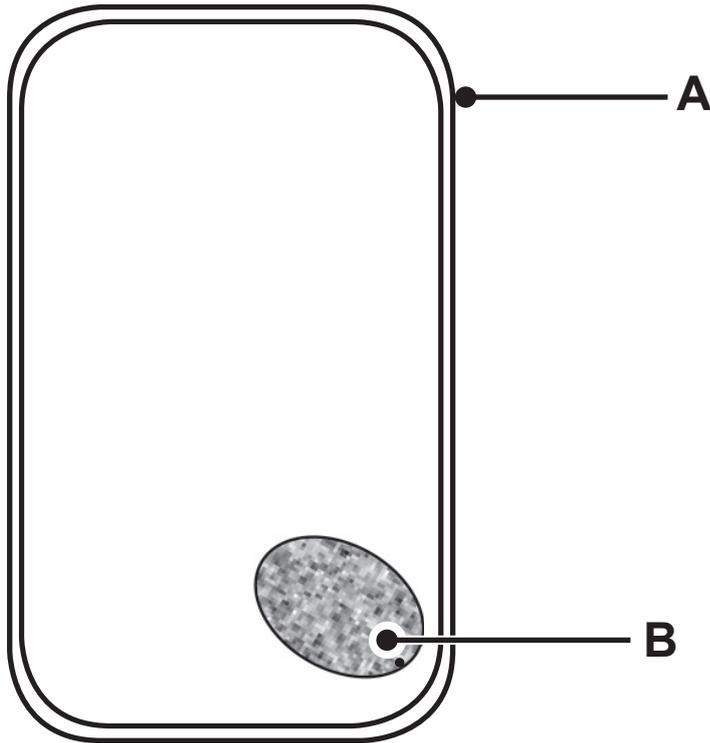
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(c) What colour change showed sugar was present?  
[2 marks]

Colour at start \_\_\_\_\_

Colour at end \_\_\_\_\_

3 The diagram shows part of a leaf cell.



Look at the diagram.

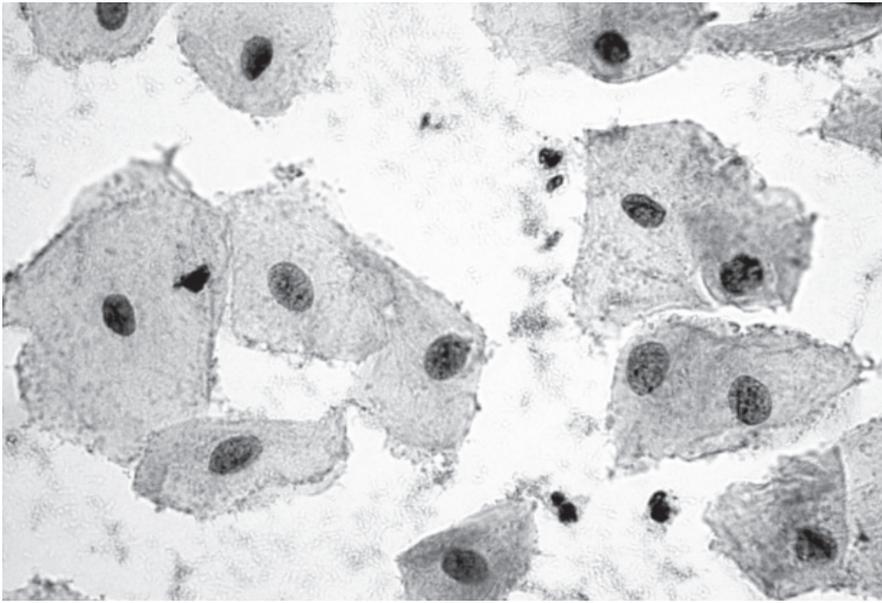
(a) Name parts **A** and **B**. [1 mark for each part]

**A** \_\_\_\_\_

**B** \_\_\_\_\_

(b) **Complete the diagram** by drawing the vacuole and a chloroplast. [2 marks]

- (c) The photograph shows some cells stained and viewed under the microscope.



Look at the photograph.

- (i) Suggest why the cells were stained. [1 mark]

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- (ii) Name the type of cells shown in the photograph.

Tick (✓) the correct answer. [1 mark]

plant	<input type="checkbox"/>
virus	<input type="checkbox"/>
animal	<input type="checkbox"/>
bacterium	<input type="checkbox"/>

4 (a) Teeth begin the mechanical digestion of food into smaller pieces.

(i) Choose the part of the digestive system where mechanical digestion begins.

Draw a **circle** around the correct answer. [1 mark]

**stomach**      **colon**      **buccal cavity**      **liver**

Amylase acts on the starch in bread.

(ii) Suggest how breaking the bread into smaller pieces affects the speed of action of amylase.

Explain your answer. [2 marks]

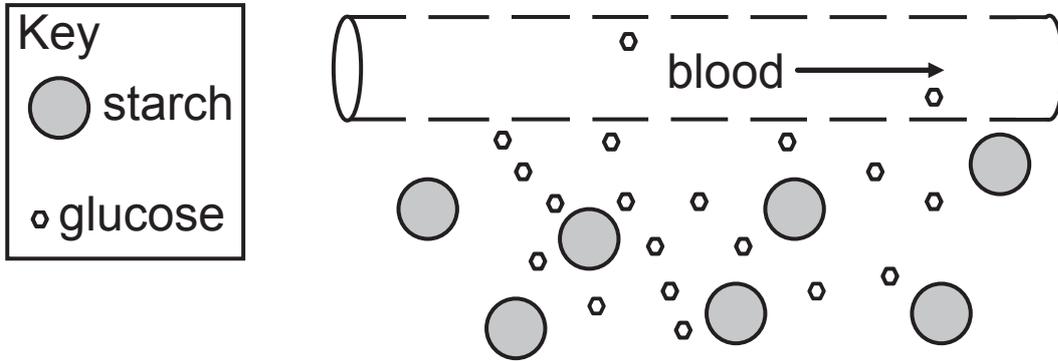
Speed \_\_\_\_\_

Explanation \_\_\_\_\_

\_\_\_\_\_

Starch is broken down into glucose.

The diagram shows the absorption of glucose into the blood.



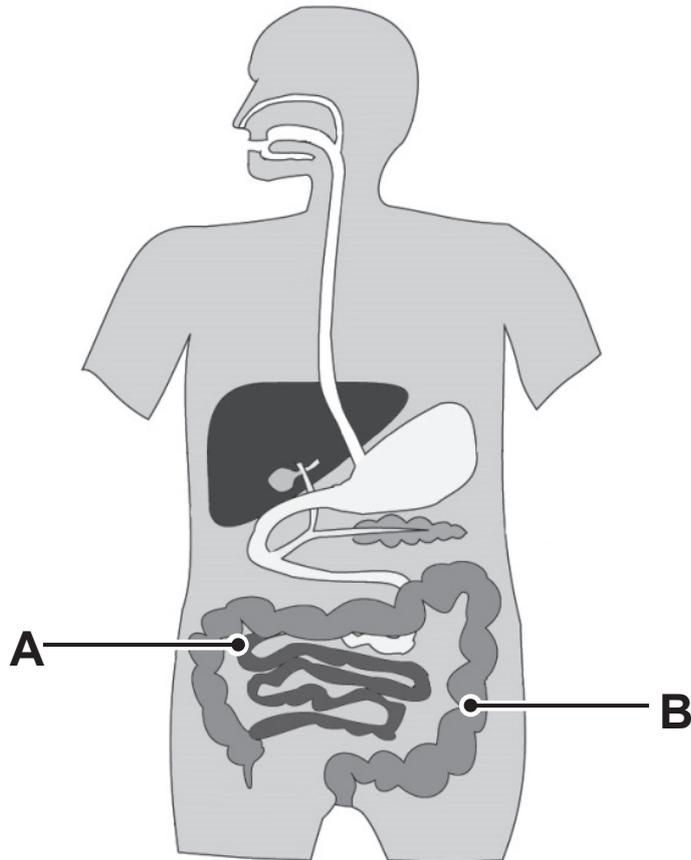
(b) Use information from the diagram to explain why starch needs to be digested. [2 marks]

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The diagram shows part of the digestive system.



Look at the diagram.

**(c) Complete the table** by naming parts **A** and **B**.  
[2 marks]

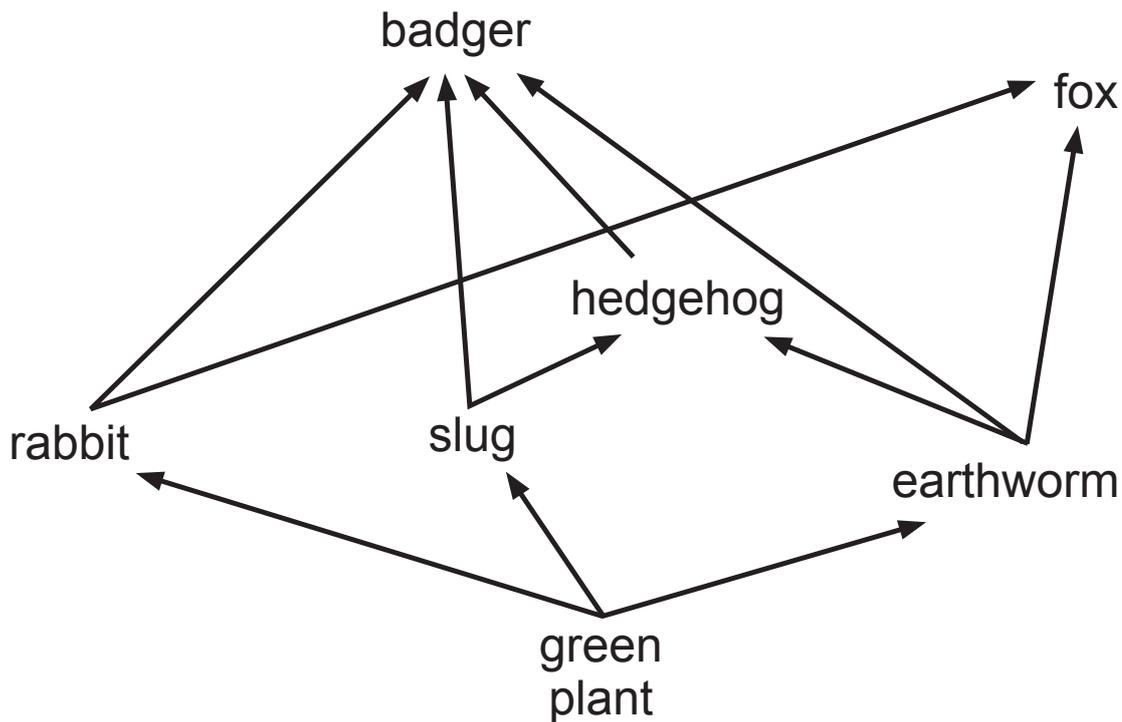
Give the function of part **B**. [1 mark]

Part	Name	Function
<b>A</b>		absorbs digested food
<b>B</b>		

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**(Questions continue overleaf)**

5 The diagram shows part of a food web from a woodland.



(a) Why are green plants described as producers?  
[2 marks]

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(b) How many primary consumers are there in this food web?  
[1 mark]

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(c) Name the animal that feeds at **two** different trophic levels.  
[1 mark]

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**(d)** Complete the food chain. [2 marks]

green plant

slug

**(e)** Explain why the number of hedgehogs may decrease if a disease killed most of the rabbits. [2 marks]

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**(f)** Families of approximately six badgers live underground in setts.

Badgers are difficult to count because they are most active at night.

The number of badgers in this woodland was estimated by counting the number of badger setts rather than trapping individual badgers.

**(i)** Suggest one advantage of using this method to estimate the numbers of badgers in the woodland rather than trapping. [1 mark]

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(ii) This method may not give accurate results.

Suggest why. [1 mark]

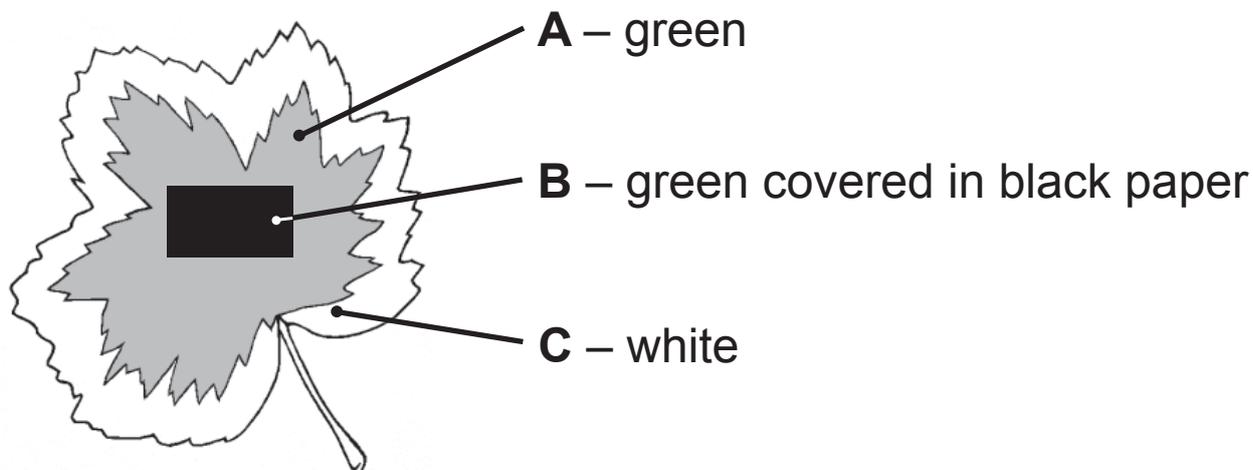
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6 The drawing shows a variegated leaf used in a photosynthesis experiment.



Look at the drawing.

(a) Why is the leaf used in this experiment described as variegated? [1 mark]

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(b) The leaf was destarched before the experiment.

(i) Describe how the leaf was destarched. [2 marks]

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(ii) Why was it important to destarch the leaf before the experiment? [1 mark]

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(c) The destarched leaf was left in bright light for 24 hours.

It was then tested for starch using a chemical reagent.

The table shows some of the results.

Part of leaf	Colour of chemical reagent	
	before test	after test
<b>A</b>	yellow/brown	
<b>B</b>	yellow/brown	
<b>C</b>	yellow/brown	yellow/brown

(i) Name the chemical reagent used to test a leaf for starch. [1 mark]

\_\_\_\_\_

(ii) **Complete the table** to show the results for parts **A** and **B** of the leaf. [2 marks]

(iii) Explain the result for part **C** of the leaf.  
Use evidence from the table in your answer.  
[3 marks]

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

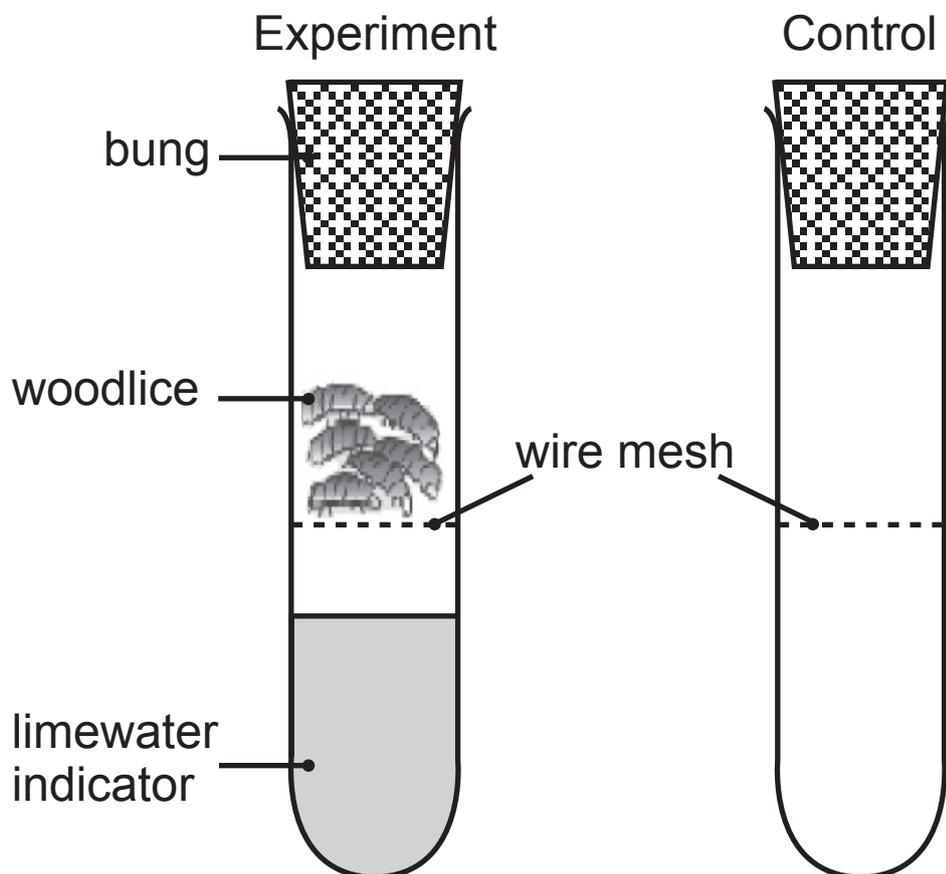
\_\_\_\_\_

- 7 A pupil set up an experiment to investigate respiration in woodlice.

She placed several woodlice on a wire mesh in a test tube containing limewater indicator.

Limewater indicator shows the presence of carbon dioxide by becoming cloudy.

She placed a bung in the test tube for 60 minutes.



(a) The bung was left in the test tube for no longer than 60 minutes.

Suggest why. [2 marks]

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After 60 minutes the limewater indicator changed from clear to cloudy.

(b) Explain why the limewater indicator turned cloudy. [1 mark]

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(c) A control was needed to show that the change in the limewater indicator was due to the woodlice.

**Complete the diagram** of the control tube by drawing and labelling its contents. [2 marks]

(d) Give **one** way woodlice use the energy released by respiration. [1 mark]

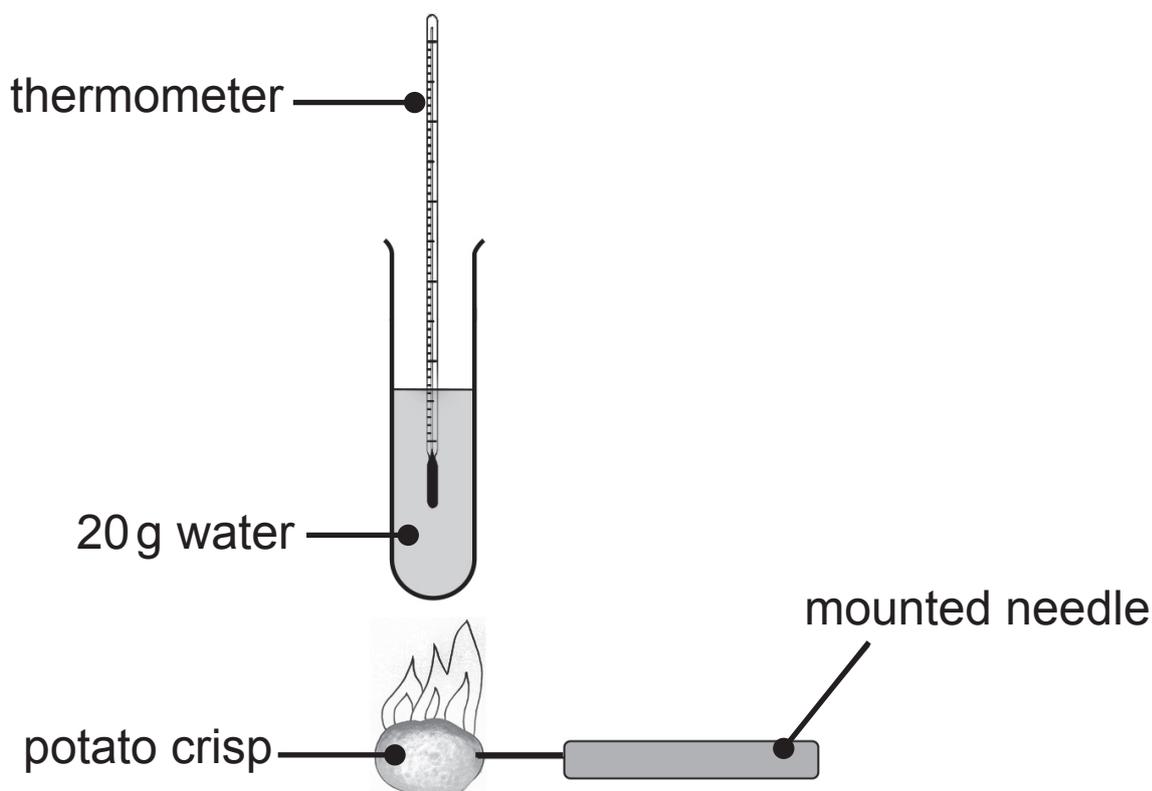
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- 8 The diagram shows the apparatus a pupil in a class used to measure the energy content of a potato crisp.

The temperature of the water at the start was 14°C.

A burning potato crisp was held under the test tube until it went out.

The temperature of the water at the end was 17°C.



The energy in the potato crisp is calculated using the formula.

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

- (a) Calculate the energy in the potato crisp.  
Show your working. [2 marks]

Energy \_\_\_\_\_ J

- (b) What other measurement would the pupils in the class need to take so that they all could compare their results? [1 mark]

\_\_\_\_\_

- (c) The result for the energy content in this potato crisp may be lower than the value given on the packet.

Suggest **two** reasons why. [2 marks]

1. \_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

- (d) Potato crisps contain carbohydrates.

Carbohydrates are made up of three elements.

One of these elements is hydrogen.

Name the other **two** elements. [2 marks]

\_\_\_\_\_ and \_\_\_\_\_

- (e) The table shows how the energy requirements of a boy change with age.

Age /years	Energy requirement per day /kJ
1	3000
2	6000
5	7000
10	10 000
15	12 000
18	13 000

- (i) Describe and explain the trend in the table.  
[2 marks]

Description \_\_\_\_\_

Explanation \_\_\_\_\_

- (ii) Give **two** factors, **other than age**, which would affect the daily energy requirement of a person.  
[2 marks]

1. \_\_\_\_\_

2. \_\_\_\_\_

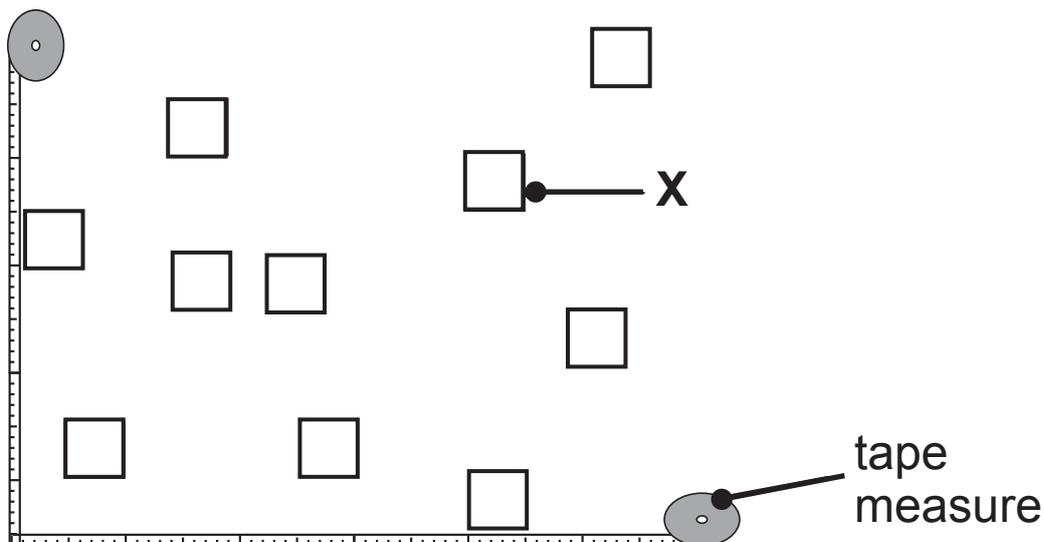
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- 9 Pupils carried out an investigation to estimate the size of a population of daisies on a playing field.

They placed two tape measures at right angles on the playing field.

They then placed apparatus **X** at 10 random coordinates inside the area enclosed by the two tape measures.



- (a) Name apparatus **X**. [1 mark]

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- (b) Explain why random coordinates were used to decide where to place apparatus **X**. [1 mark]

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The area of apparatus **X** is  $0.25\text{ m}^2$ .

**(c)** Describe how the pupils would have used apparatus **X** to calculate the number of daisies per square metre on the playing field. [2 marks]

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**10** Sulfur dioxide is one cause of acid rain.

**(a)** Explain how sulfur dioxide forms acid rain. [2 marks]

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**(b)** Describe **one** harmful effect acid rain has on living organisms. [1 mark]

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The table shows changes in sulfur dioxide emissions in Ireland from 1999 to 2007.

<b>Year</b>	<b>Sulfur dioxide emissions /1000 tonnes</b>
1999	159.5
2000	140.5
2001	135.5
2002	102.2
2003	79.4
2004	71.7
2005	70.4
2006	60.3
2007	54.7

(c) Describe the change in sulfur dioxide emissions from 1999 to 2007.

Suggest **one** reason for this change. [2 marks]

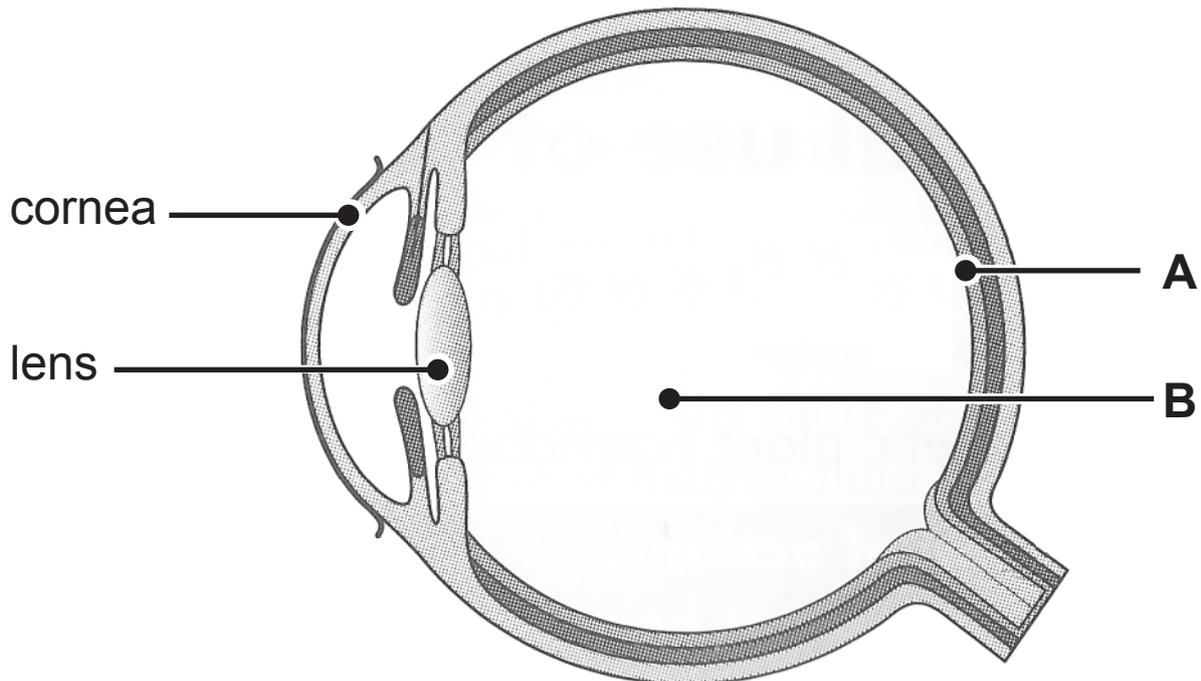
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11 The photograph shows a section through an eye.



(a) Name and give the function of parts **A** and **B**.  
[1 mark for name and 1 mark for function]

**A** \_\_\_\_\_

Function \_\_\_\_\_

\_\_\_\_\_

**B** \_\_\_\_\_

Function \_\_\_\_\_

\_\_\_\_\_

(b) The lens and the cornea work together to carry out one function.

Describe this function. [1 mark]

\_\_\_\_\_

\_\_\_\_\_

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**(Questions continue overleaf)**

**12** The photograph shows a farmer in a rainforest area clearing land by cutting down and burning trees.



Use your knowledge and understanding of the carbon cycle to explain how

- cutting down and burning trees affects the concentration of the carbon dioxide in the atmosphere.
- the change in the atmospheric carbon dioxide concentration harms the environment. [6 marks]



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**THIS IS THE END OF THE QUESTION PAPER**

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**SOURCES**

- Q1 .....Image - Microscope, © Oleg Lopatkin / iStock / Thinkstock
- Q3 .....Diagram - Leaf cell, © Chief Examiner
- Q3(c)..... Image - Cells, © Dr Gopal Murti / Science Photo Library
- Q4.....Diagram - absorption of glucose into the blood, © Chief Examiner
- Q6.....Diagram - Variegated leaf, © Chief Examiner
- Q7.....Diagram - experiment to investigate respiration in woodlice, © Chief Examiner
- Q8.....Diagram - to measure the energy content of a potato crisp, © Chief Examiner
- Q9.....Diagram - investigation on the size of a population of daisies, © Chief Examiner
- Q10(b).....Table - changes in sulfur dioxide emission in Ireland from 1999 to 2007, Greenhouse Gas and Acid Rain Precursor Accounts for Ireland 1998-2007. © Government of Ireland 2009, Material compiled by the Central Statistics Office. ISBN: 978-1-4064-2098-2. Licensed under: <https://creativecommons.org/licenses/by/4.0/legalcode>
- Q11.....Diagram - an eye, © GCSE Biology for CCEA, Revision Book by James Napier. Published by Hodder Education. ISBN: 9780340940556. "Reproduced by permission of Hodder Education".
- Q12 .....Image - Farmer in a rainforest clearing land, © Vaughan Fleming / Science Photo Library

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<b>Question Number</b>	<b>Marks</b>
1	
2	
3	
4	
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11	
12	
<b>Total Marks</b>	

Examiner Number