



General Certificate of Secondary Education
2015–2016

Centre Number

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Candidate Number

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Science: Single Award

Unit 1 (Biology)
Foundation Tier



[GSS11]

WEDNESDAY 11 NOVEMBER 2015, MORNING

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

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

Write your answers in the spaces provided in this question paper.
Answer **all ten** questions.

INFORMATION FOR CANDIDATES

The total mark for this paper is 60.

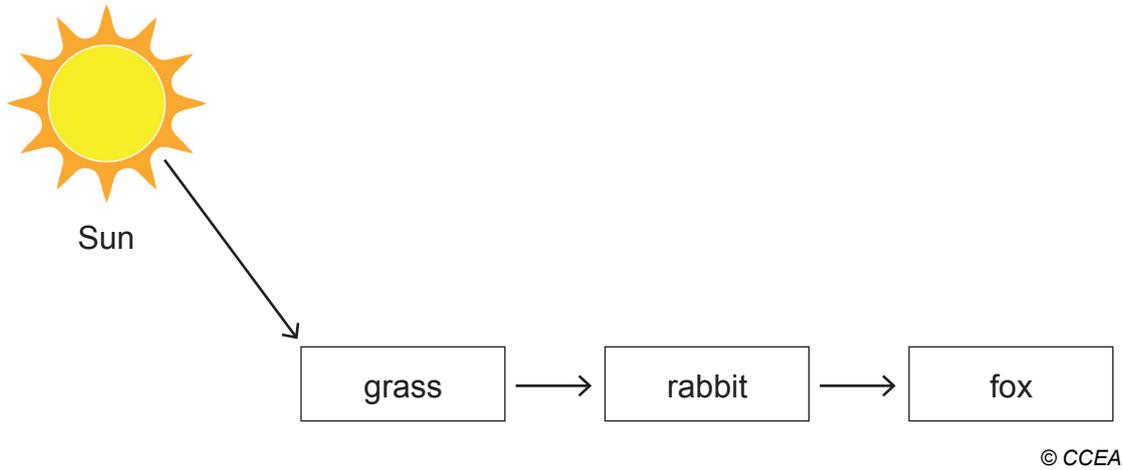
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

Quality of written communication will be assessed in Question 8.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total Marks	

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1 (a) Shown below is a simple food chain.



In this food chain how are the grass and fox described?

Choose from:

primary consumer : secondary consumer

original energy source : producer

grass _____

fox _____ [2]

(b) Animals get energy from the food they eat. Name **two** food types that provide this energy.

Choose from:

vitamin C : water : carbohydrate : calcium : fat

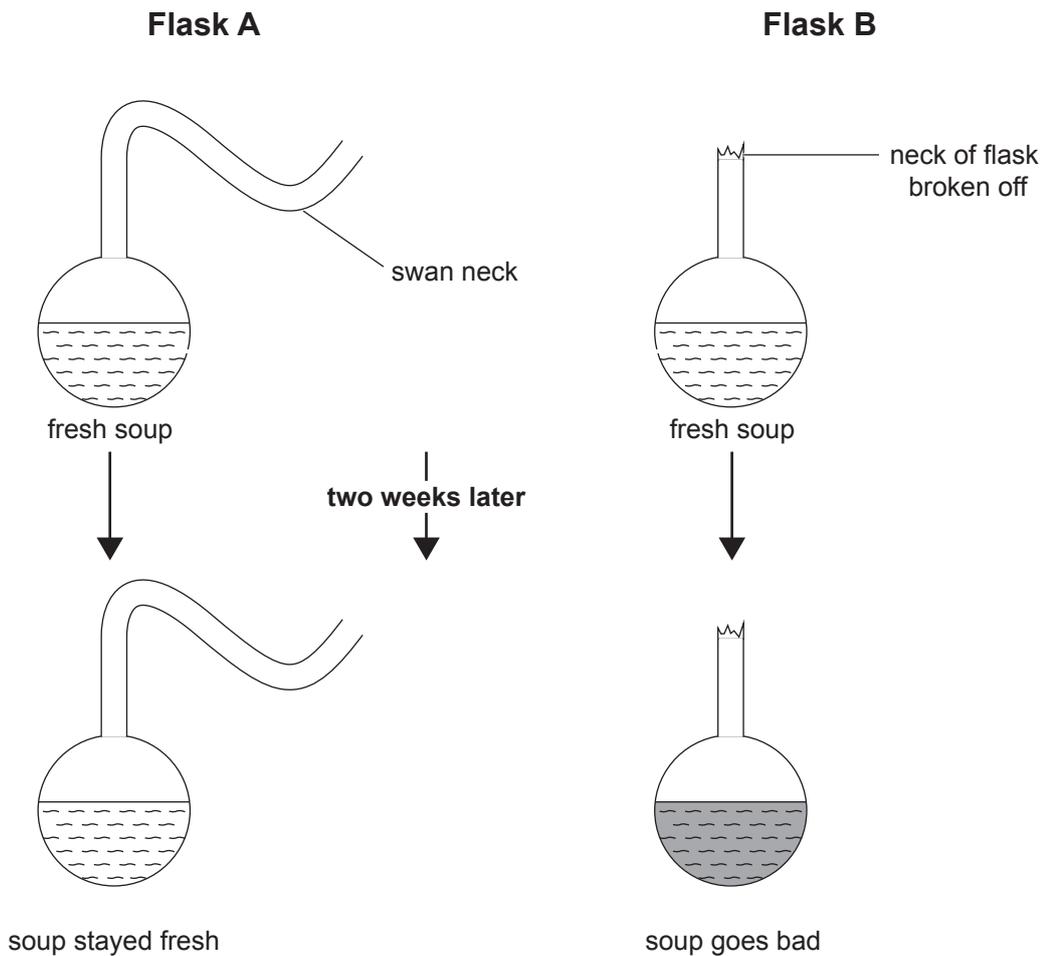
1. _____

2. _____ [2]

Examiner Only	
Marks	Remark

- 2 (a) The diagram below shows an investigation into the contamination of food.

Examiner Only	
Marks	Remark



- (i) Complete the sentences below.

Choose from:

glass : swan neck : soup

microorganisms : dust particles

The soup in flask **A** stayed fresh because

_____ were trapped by

the _____.

To make sure the investigation is a fair test it is important that the same type

of _____ is used in both flasks. [3]

(ii) Name the scientist who first carried out this investigation.

Circle the correct answer.

Fleming

Pasteur

Mendel

[1]

(b) The body is able to defend itself against infection in a number of ways. Using lines, link the method of defence with the correct description.

Method

Description

active immunity

antibodies injected into patient

antibodies produced by patient's body

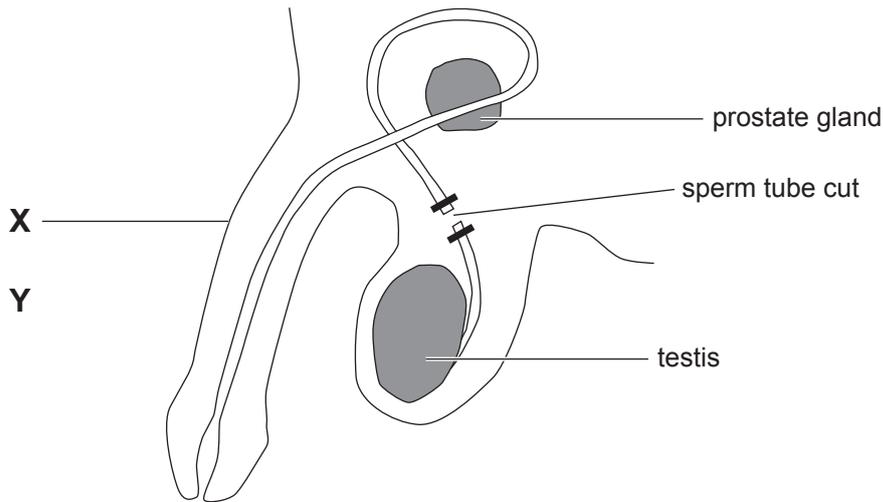
phagocytosis

phagocytes engulf and digest microorganisms

[2]

Examiner Only	
Marks	Remark

3 (a) The diagram below shows the male reproductive system.



Source: CCEA

(i) Name the structure labelled X.

_____ [1]

(ii) On the diagram, draw a line from the letter Y to the urethra. [1]

(b) (i) Name the method of contraception shown in the diagram.

_____ [1]

(ii) Using the diagram, explain fully how the method of contraception shown prevents pregnancy.

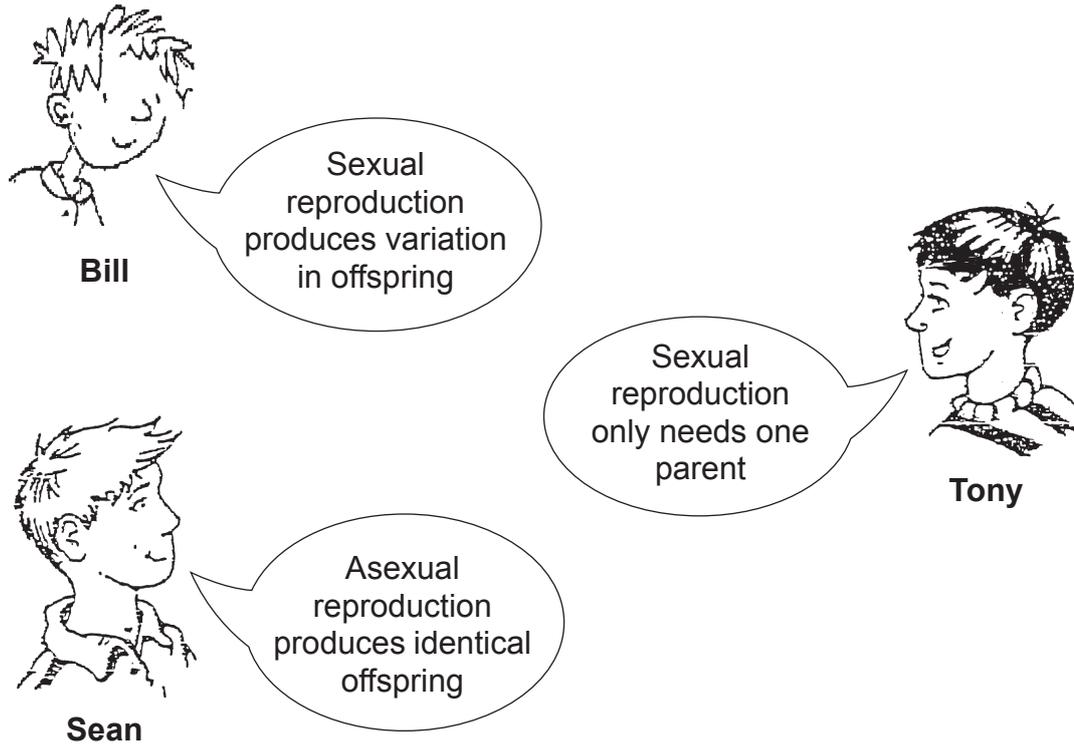
 _____ [2]

(c) Condoms are another type of contraception. Give **two** advantages of using condoms as contraceptives.

1. _____
 2. _____ [2]

Examiner Only	
Marks	Remark

(d) Three students were discussing sexual and asexual reproduction.



Source: CCEA

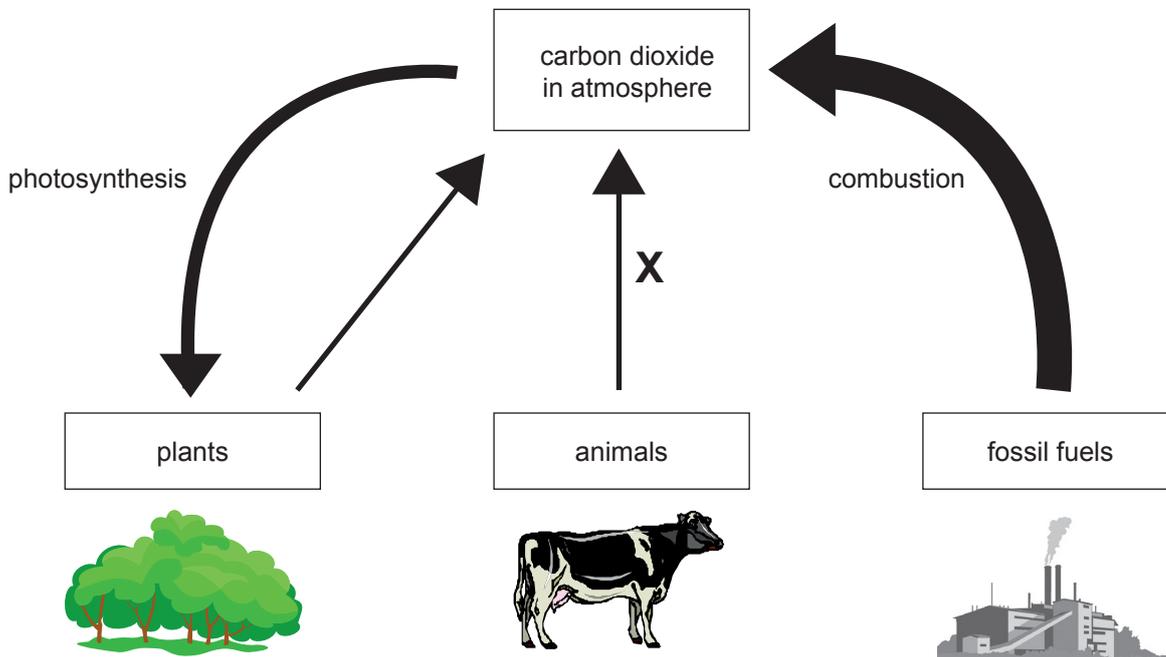
One of the statements is incorrect.
Name the student who made the wrong statement.

[1]

Examiner Only	
Marks	Remark

- 4 (a) The diagram below shows how carbon dioxide enters and leaves the atmosphere. The arrows show the movement of carbon dioxide.

The thicker the arrow the more carbon dioxide.



Source: CCEA

- (i) Name the process labelled X in the diagram.

_____ [1]

- (ii) Using the diagram, explain why the amount of carbon dioxide in the atmosphere is increasing.

 _____ [2]

- (b) The increase in carbon dioxide is leading to global warming. Give **one** effect of global warming.

_____ [1]

Examiner Only

Marks Remark

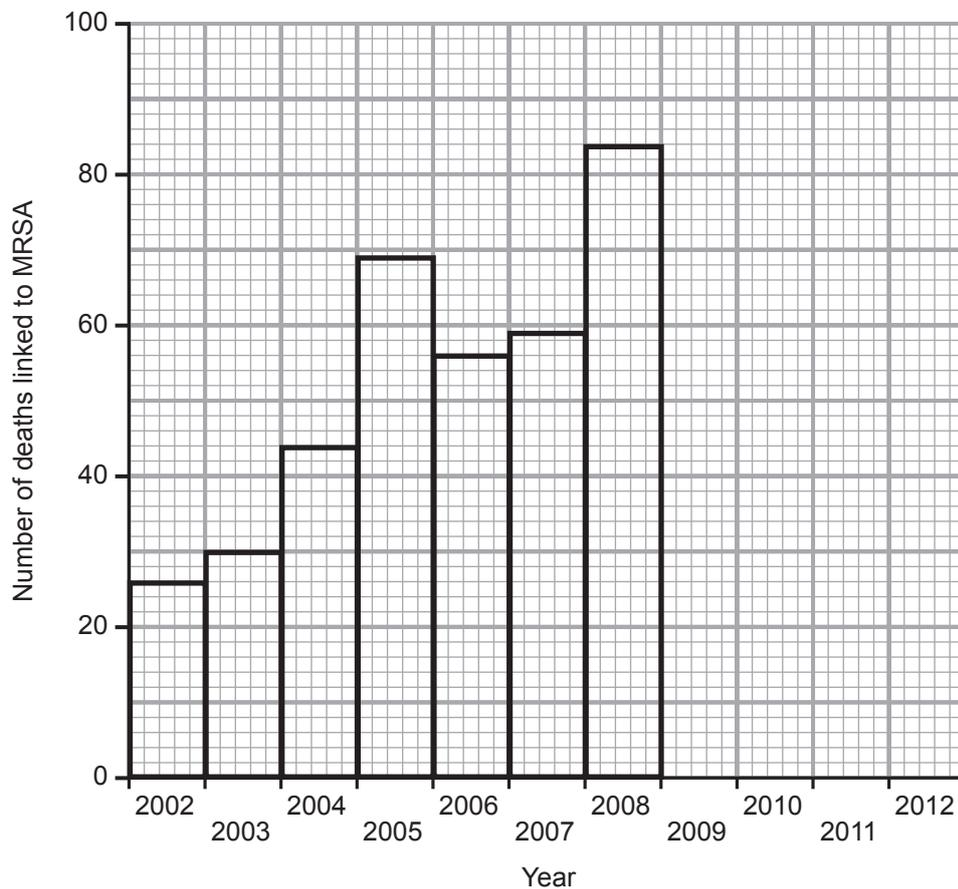
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(Questions continue overleaf)

- 5 (a) The table below shows the number of deaths in Northern Ireland between 2002–2012 that are linked to the bacterial infection MRSA.

Year	Number of deaths linked to MRSA
2002	26
2003	30
2004	44
2005	69
2006	56
2007	59
2008	84
2009	50
2010	29
2011	30
2012	18

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- (i) Using the data in the table complete the histogram below.



[2]

- 6 Lichens are good indicators of air pollution. Sulfur dioxide produced by burning fossil fuels is particularly harmful to lichens.

(a) Complete the following sentence.

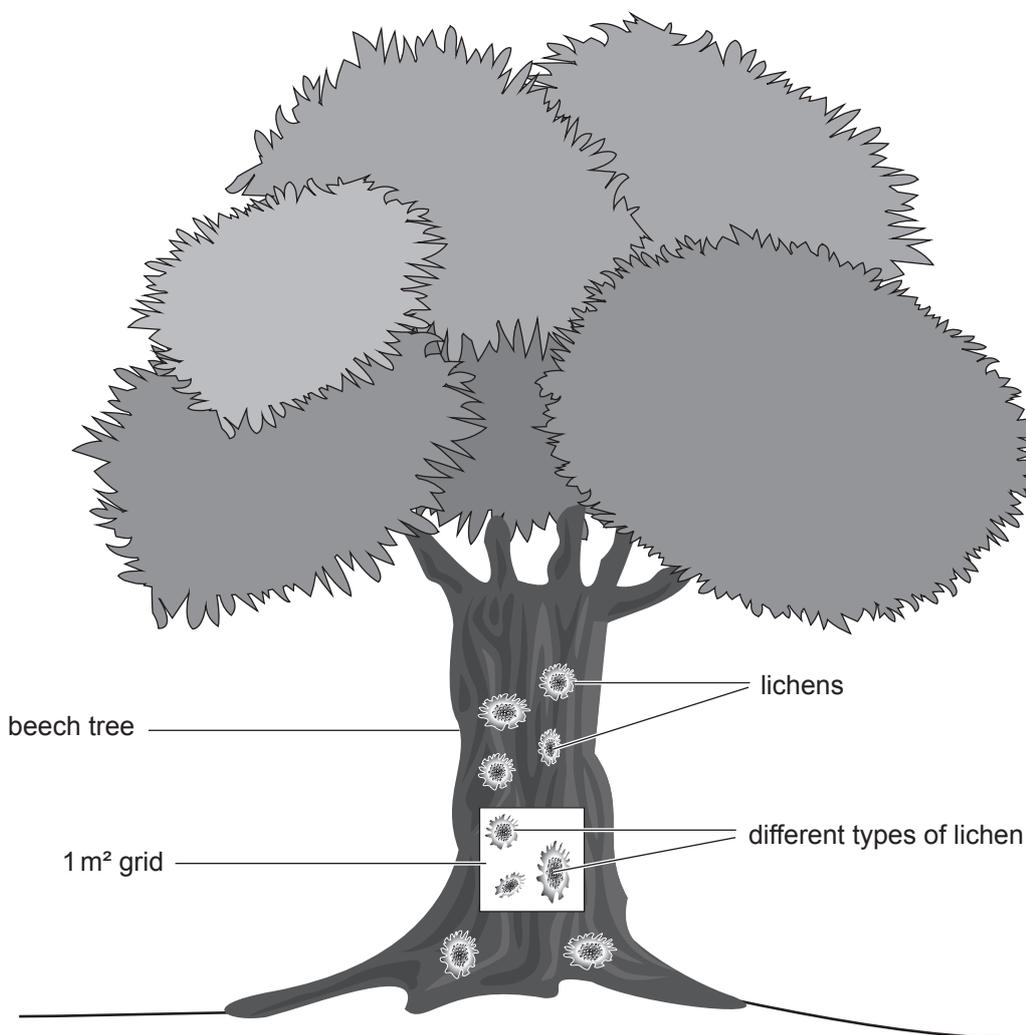
When sulfur dioxide mixes with moisture in the air

it produces _____

[1]

(b) The number of different types of lichen species in 1 m^2 at the base of a beech tree was counted. This was repeated at different distances from a town centre.

The percentage of the 1 m^2 grid covered by lichen was also recorded.



Source: CCEA

Examiner Only	
Marks	Remark

The results are shown in the table below.

	Distance from town centre/km								
	0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Number of species of lichen	0	1	3	3	4	5	5	5	5
Percentage cover/%	0	10	10	20	20	30	30	30	30

Using the information provided, answer the following questions.

- (i) Give the shortest distance from the town centre that sulfur dioxide no longer affects lichen.

_____ km [1]

- (ii) Suggest **one** way the investigation could be made more reliable.

_____ [1]

- (iii) Suggest **one** reason why there is more sulfur dioxide pollution in a town centre than in the countryside.

_____ [1]

Examiner Only

Marks Remark

7 (a) The diagram below shows a short section of DNA.



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(i) What name is given to the shape of DNA?

[1]

(ii) DNA is formed into chromosomes. What are short sections of chromosomes called?

[1]

(b) In sweet pea plants, the allele for red flowers (**R**) is dominant to the allele for white flowers (**r**).

(i) Give the two possible **genotypes** of a plant producing red flowers.

1. _____

2. _____

[2]

Examiner Only	
Marks	Remark

A red flowered plant and a white flowered plant were bred together. There were four offspring produced; two that produced red flowers and two that produced white flowers.

- (ii) Complete the Punnett square to show the gametes of the parent plants and the genotypes of the offspring plants.

		red flowered plant	
		R	
white flowered plant		Rr	
	r		

[3]

- (c) Another type of plant can produce many different colours of flower between red and white. For example, dark red, light red, pink and white.

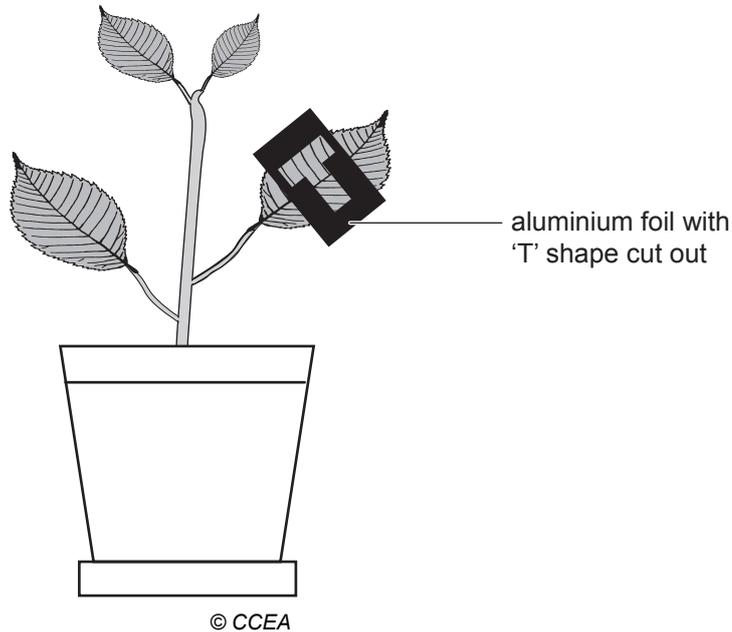
Name this type of variation. Explain your answer.

[2]

Examiner Only	
Marks	Remark

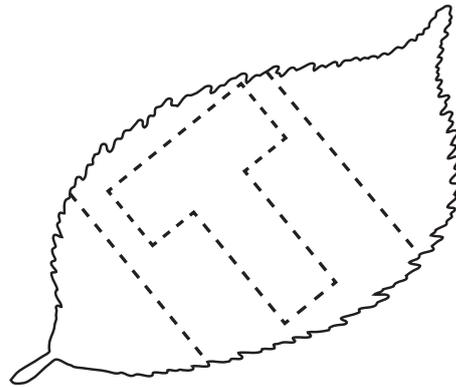
9 Photosynthesis is a light-requiring process that takes place in plants.

In a photosynthesis investigation a leaf of a plant was partly covered with aluminium foil and placed in bright light.



After five days in bright light the aluminium foil was removed and the leaf tested for starch.

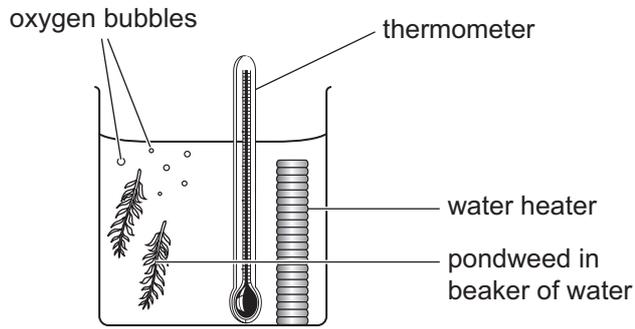
(a) Using the outline of the leaf below, shade **all** the parts where you would expect to find starch.



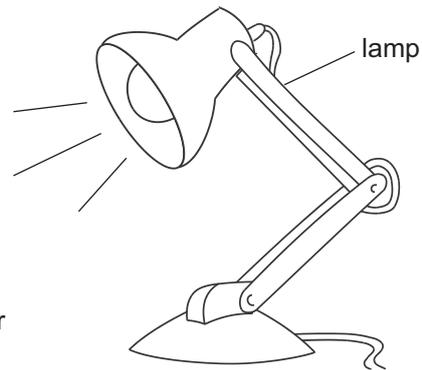
[1]

Examiner Only	
Marks	Remark

- (b) In another investigation, the effects of light intensity and temperature on photosynthesis were analysed. The apparatus used is shown in the diagram below.



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© CCEA

- (i) Suggest **one** way the light intensity could be changed.

_____ [1]

- (ii) Suggest why it is important to have a thermometer in the beaker when investigating the effect of light intensity.

 _____ [1]

Examiner Only

Marks Remark

The results of the investigation are shown in the table below.

Temperature/°C \ Light intensity	Number of oxygen bubbles per minute		
	Low	Medium	High
10	3	5	12
15	5	10	22
20	8	12	30

(iii) Describe and explain the effect of **light intensity** on the number of oxygen bubbles produced.

[3]

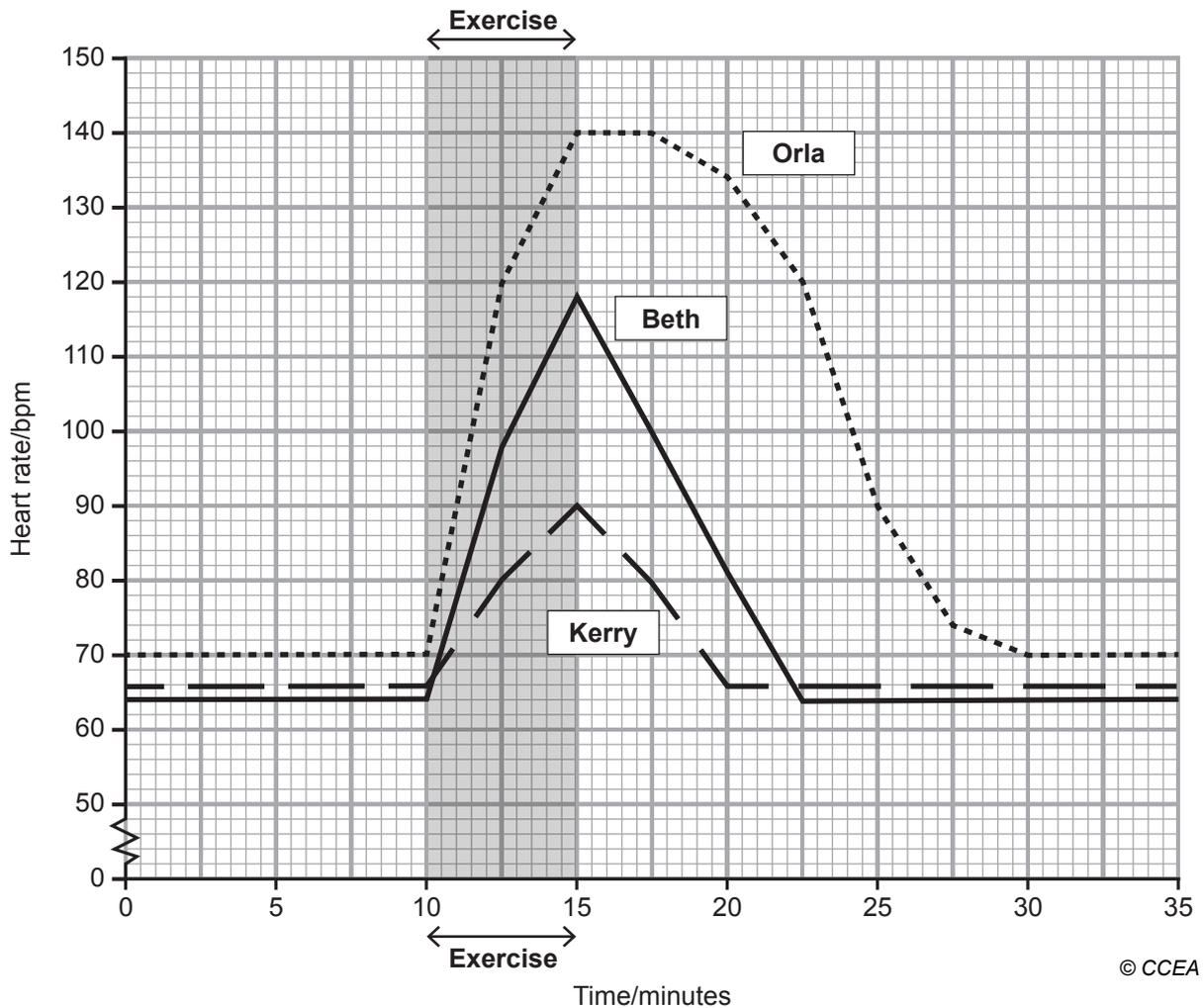
(iv) Apart from the effect of light intensity, state **one** other trend shown by these results.

[1]

Examiner Only

Marks Remark

10 (a) The graph below shows the effect of exercise on the heart rates of three girls.



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(i) Calculate the maximum increase in **Orla's** heart rate during exercise.

_____ bpm [1]

(ii) Calculate the percentage increase in **Orla's** heart rate during exercise.

_____ % [1]

(iii) Using the graph, name the girl who is the fittest. Explain your answer giving **one** piece of evidence.

Name _____

Explanation _____

_____ [2]

Examiner Only	
Marks	Remark

(b) Exercise helps prevent heart disease.
Describe and explain how heart disease can affect the wider family.

[2]

Examiner Only	
Marks	Remark

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