



Rewarding Learning

General Certificate of Secondary Education
2021–2022

Centre Number

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Candidate Number

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Double Award Science: Biology

Unit B1

Foundation Tier



[GDW11]

GDW11

TUESDAY 17 MAY 2022, MORNING

TIME

1 hour.

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 eight** 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.



- 1 The list below gives some ecological terms.

biodiversity	population	habitat
environment	community	ecosystem

Choose the ecological term from the list above that matches the definitions in the table below.

Write your answers in the empty boxes in the table.

Definition	Ecological term
The place where an organism lives.	
The conditions which surround organisms where they live.	
The number of organisms of one species living in an area.	
The variety of species living in an area.	

[4]



2 The names and descriptions of some of the processes in the carbon cycle are given below.

(a) Use a **ruler** to draw a line to link each process with its correct description.

Process	Description
	Plants and animals die and decay.
Respiration	Dead plants and animals form coal and oil.
Fossilisation	Plants trap light and produce glucose.
Combustion	Animals eat plants.
Photosynthesis	Cells release energy from glucose.
	Coal and oil are burned.

[4]

(b) Which **two** processes named above **add** carbon dioxide to the atmosphere?

_____ and _____ [2]

[Turn over



3 The kidneys are part of the excretory system.

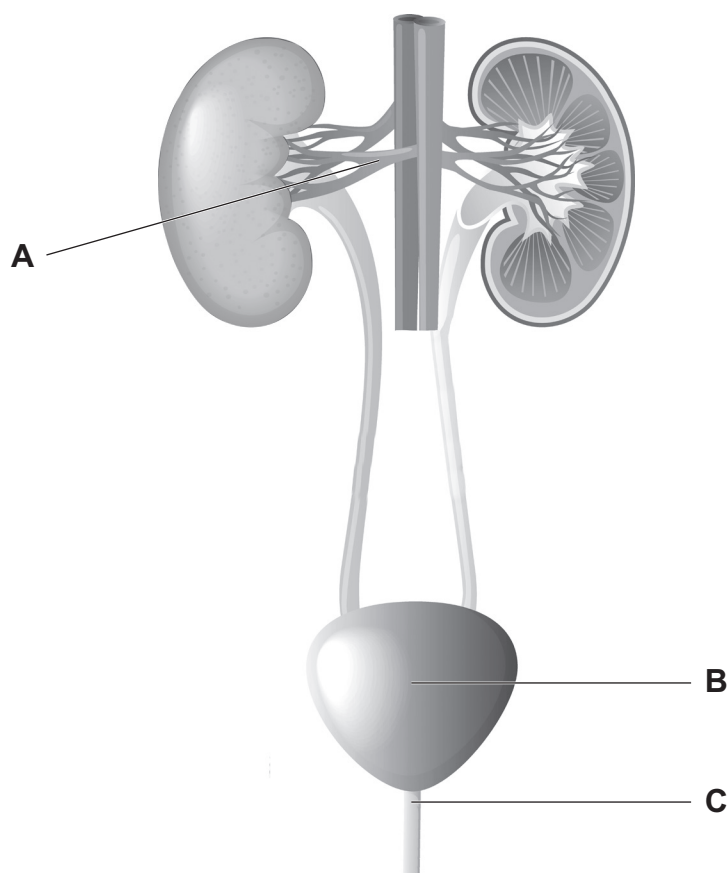
- (a)** Complete the sentences below about the excretory system by writing in the blank spaces.

The kidneys filter the _____ and also carry out osmoregulation.

Osmoregulation balances the water gained from food, drink and respiration with water lost from urine, breathing out and _____. [2]



(b) The diagram below shows the excretory system.



Use the diagram to answer the following questions.

(i) Name blood vessel **A** that transports blood **out** of the kidney.

_____.

[1]

(ii) Name structures **B** and **C**.

B _____.

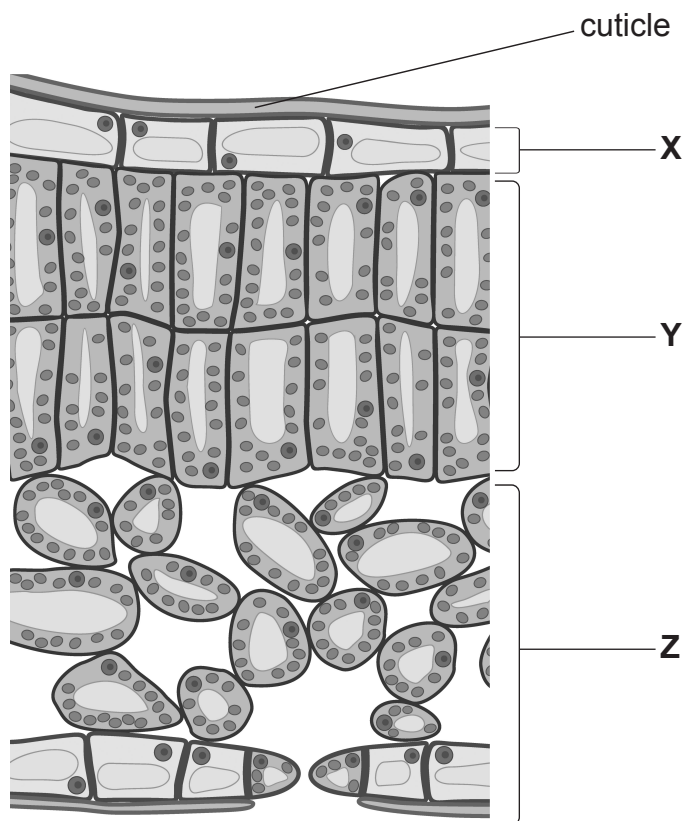
C _____.

[2]

[Turn over



4 The diagram below shows a cross section of a leaf.



(a) How is the **cuticle** of the leaf adapted:

- to allow light through?

- to reduce water loss?

[2]

(b) Name the layers of the leaf labelled X, Y and Z.

X _____

Y _____

Z _____

[3]



Use the diagram of the leaf opposite to answer the following questions.

(c) (i) Give the letters of the **two** layers that carry out photosynthesis.

_____ and _____ [1]

(ii) Explain your answer.

_____ [1]

[Turn over



- 5 Kiwis are flightless birds found only in New Zealand.
The population of kiwis is decreasing each year.

The photograph shows a sign to warn about kiwis crossing the road.



- (a) Read the passage below about kiwis and answer the questions that follow.

Kiwis feed on plants and worms.

Rabbits and worms feed on plants.

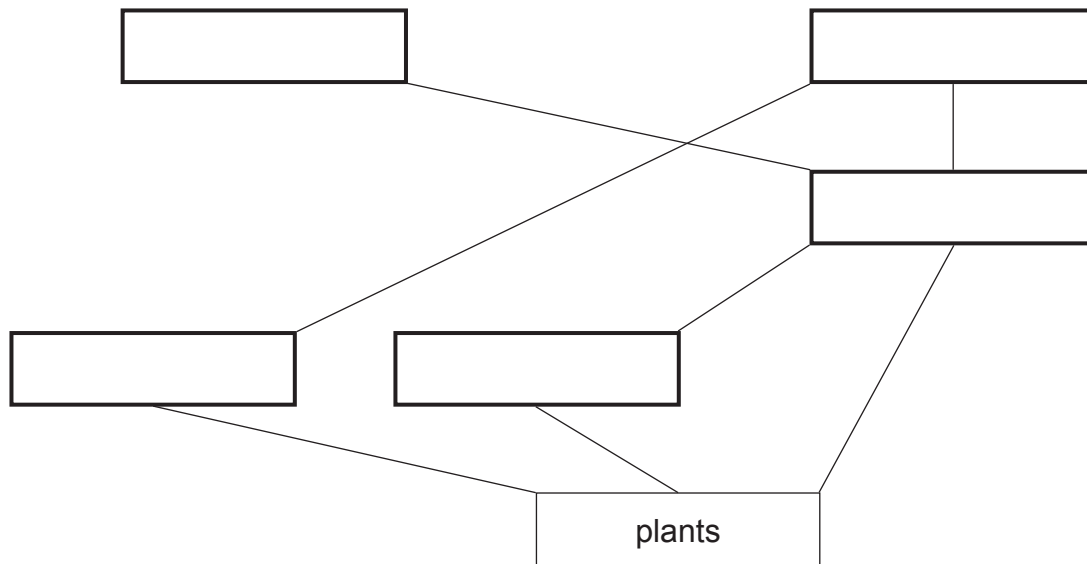
Kiwis had few predators before people introduced animals like dogs and stoats.

Stoats were brought into New Zealand to kill rabbits that had been introduced into the country.



- (i) Use the information in the passage opposite to write the names of the organisms in this food web in the empty boxes.

Complete the food web by adding **arrowheads** to the lines.



[4]

- (ii) What types of consumer are the kiwis in this food web?

_____ and _____ [2]

[Turn over



- (b) In 1998 the population of kiwis was 100 000.
In 2008 the population of kiwis was 70 000.

- (i) Calculate the percentage (%) reduction in the kiwi population between 1998 and 2008.

Show your working.

_____ % [3]

Between 2008 and 2018 measures were taken to reduce the decline in the kiwi population.

- (ii) Suggest what **one** of these measures could have been.

_____ [1]

Between 2008 and 2018 the kiwi population declined by only 0.5%.

- (iii) Calculate the size of the kiwi population in 2018.

Show your working.

_____ [3]





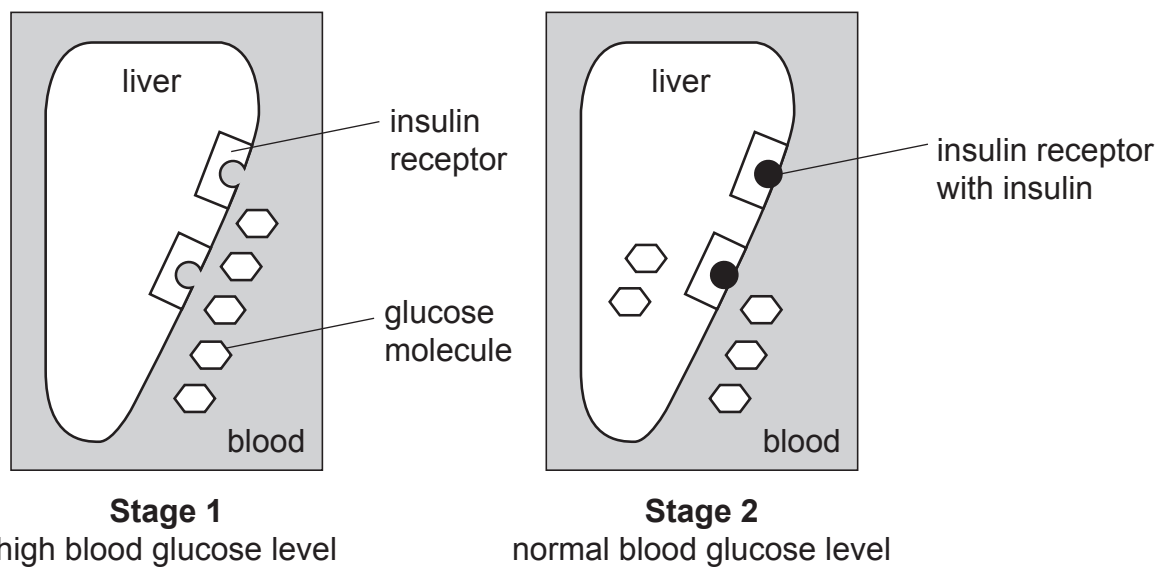
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(Questions continue overleaf)



- 6 (a) The diagrams below show the liver when blood glucose level is high (stage 1) and when it has been returned to normal (stage 2).



- (i) Use the **diagrams** to describe what happens when insulin travels in the blood to the liver.

[3]



(ii) Two further changes occur when insulin travels in the blood to the liver.

Circle the **two** correct descriptions of these changes in the list below.

more glycogen is converted to glucose	more glucose is converted to glycogen
more glucose is converted to glycerol	more respiration
less respiration	same amount of respiration

[2]

(b) Type 2 diabetes is a condition in which the blood glucose control mechanism fails.

(i) Give **two** lifestyle changes that can control Type 2 diabetes.

1. _____

2. _____ [2]

(ii) Give **one** form of treatment that can be used for Type 2 diabetes if lifestyle changes on their own are not effective.

_____ [1]

[Turn over]



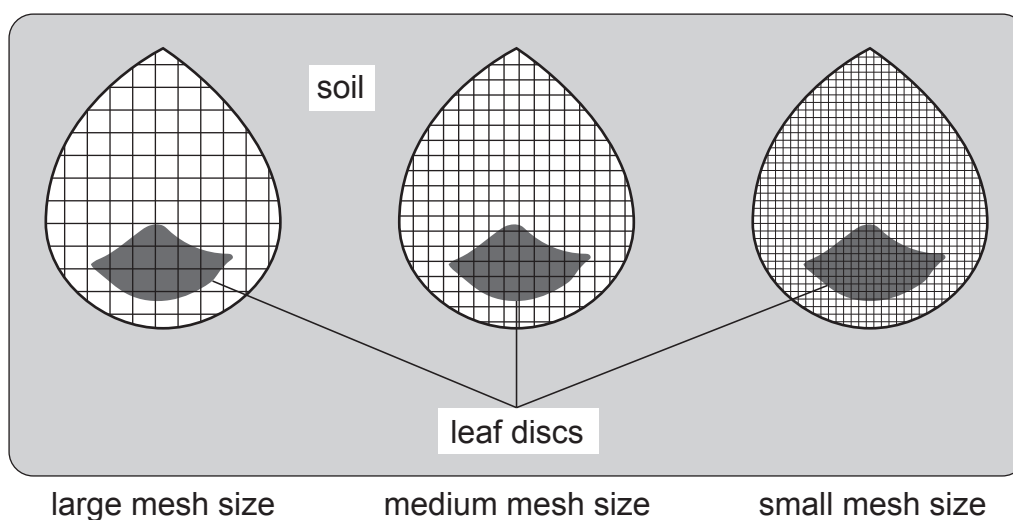
- 7 (a) Students carried out an investigation into the rate of decomposition of leaf discs. The students cut leaf discs of the same size from leaves of the same plant.

They placed equal numbers of leaf discs inside three bags of the same size. The bags had different mesh sizes (large, medium and small).

The students weighed each bag at the start of the investigation. The bags were **different masses** at the start of the investigation.

The students buried the bags in the same depth of soil.

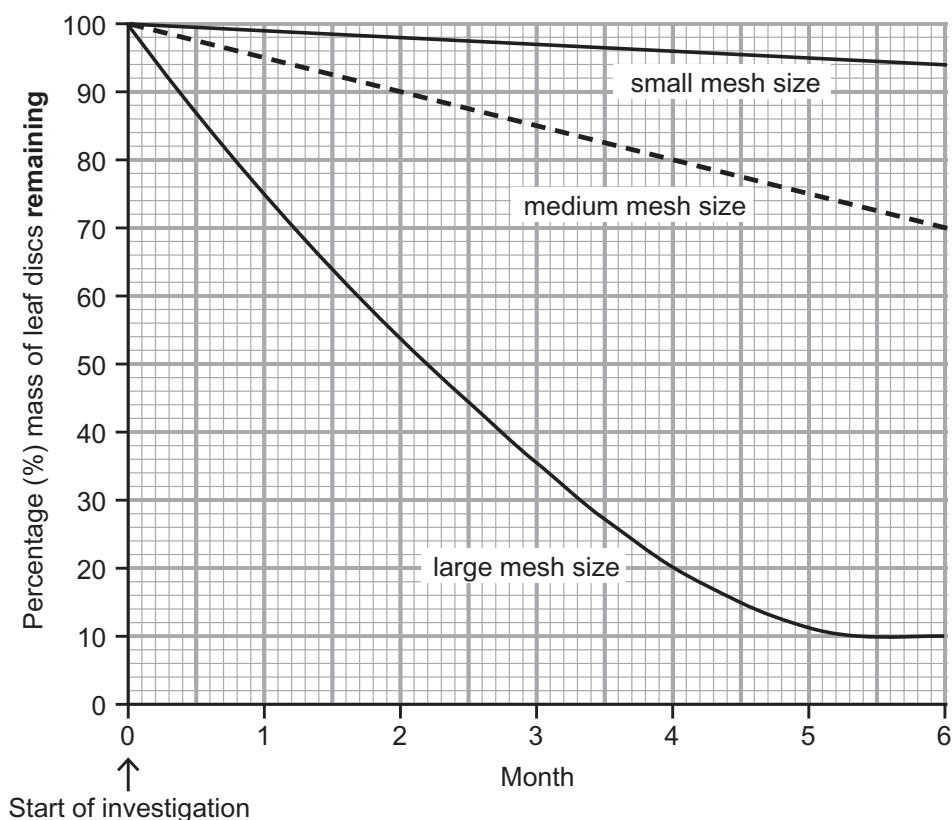
The diagram below shows the set-up of the students' investigation.



Every month for six months the students dug up the bags, weighed them and then buried them again. Every month they calculated the percentage (%) mass of leaf discs **remaining** for each bag.

The graph opposite shows their results.





Use the information and the graph to answer the following questions.

(i) Place a tick (✓) in the box which correctly describes each statement.

Statement	True	False	Can't tell
The mass of the bags was the same at the start of the investigation.	☐	☐	☐
After six months the leaf discs in the bag with the large mesh size had lost 90% of their mass.	☐	☐	☐
The rate of decomposition of the leaf discs is slowest in the bag with the small mesh size.	☐	☐	☐
The rate of decomposition of the leaf discs in the bag with the medium mesh size is faster in the first two months than in the next four months.	☐	☐	☐
Leaf discs of the same mass from a different plant would decompose faster.	☐	☐	☐

[5]

[Turn over



- (ii) Suggest an explanation for the different rate of decomposition in the bag with the large mesh compared to the bag with the small mesh.

_____ [1]

- (b) (i) Name the **two** types of microorganism that carry out decomposition.

_____ and _____ [2]

- (ii) Name the type of digestion carried out by the microorganisms in (i).

_____ [1]

As a result of decomposition both the soil and the microorganisms benefit.

- (iii) Name the beneficial substance formed in the soil by decomposition.

_____ [1]

- (iv) Suggest how the microorganisms benefit from decomposition.

_____ [1]



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Question 6(a): Chief Examiner

Question 7(a): Chief Examiner

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Question Number	Marks
1	
2	
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Total Marks	
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Examiner Number

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13193/6



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