AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.4.1

Trophic levels

Past-paper questions

Tier	**Higher**
Question groups	**17**
Available paper years	**2009–2024**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.7.4.1 Trophic levels

Question 01

January 2009 | BLY1H | Original Q6 | Legacy

6 The use of cloned animals in food production is controversial.

It is now possible to clone 'champion' cows.
Champion cows produce large quantities of milk.

6 (a) Describe how adult cell cloning could be used to produce a clone of a 'champion' cow.

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(4 marks)

4.7.4.1 Trophic levels

Question 01 · continued

for mark

6 (b) Read the passage about cloning cattle.

> The Government has been accused of 'inexcusable behaviour' because a calf of a cloned American 'champion' cow has been born on a British farm. Campaigners say it will undermine trust in British food because the cloned cow's milk could enter the human food chain.
>
> But supporters of cloning say that milk from clones and their offspring is as safe as the milk we drink every day.
>
> Those in favour of cloning say that an animal clone is a genetic copy. It is not the same as a genetically engineered animal. Opponents of cloning say that consumers will be uneasy about drinking milk from cloned animals.

Use the information in the passage and your own knowledge and understanding to evaluate whether the government should allow the production of milk from cloned 'champion' cows.

Remember to give a conclusion to your evaluation.

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(5 marks)

9

4.7.4.1 Trophic levels

Question 02

January 2009 | BLY3H | Original Q8 | Legacy

8 Read the following passage carefully.

> Petrol is a mixture which includes small amounts of nitrogen and sulfur compounds. Gasohol, a blend of ethanol with petrol, can be used in most car engines.
>
> Brazil is the world's leading producer of gasohol, using mainly ethanol from sugar cane. Other countries make use of maize or various crop wastes, such as shoots and leaves. Ethanol evaporates more readily than petrol. It releases 23.5 megajoules of energy per litre compared with 34.8 megajoules for petrol. Burning either petrol or ethanol releases carbon dioxide and water vapour into the air. But using gasohol reduces emissions of carbon monoxide and hydrocarbons. The hydrocarbons from exhaust fumes sometimes react with sunlight to form 'photochemical smog'.
>
> Opponents of the use of ethanol in motor fuel claim that it increases emissions of oxides of nitrogen from cars, but this effect has not been observed by air quality monitoring. Opponents also claim that ethanol takes more energy to produce than it releases. But other scientists report that making ethanol from sugar cane yields 8 units of energy for each unit used in production, while ethanol from maize gives 1.34 units.

Evaluate the scientific basis for and against the blending of ethanol with petrol.
Use information from the passage and your own knowledge of biology.
Remember to give a conclusion to your evaluation.

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(5 marks)

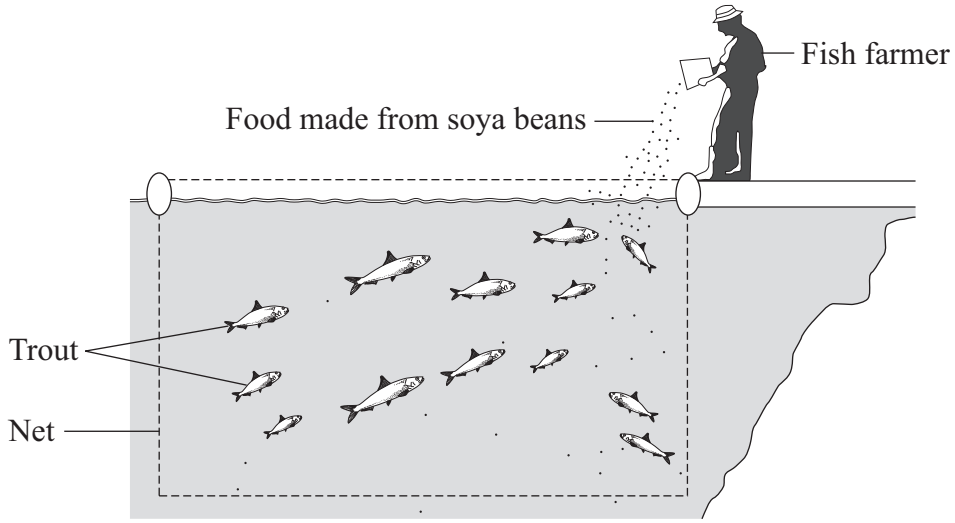
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4.7.4.1 Trophic levels

Question 03

January 2010 | BLY2H | Original Q1 | Legacy

1 A fish farmer keeps trout in a large net in a lake.



The fish farmer feeds the trout on food made from soya beans.

When the trout are large enough the farmer sells them for food for people.

1 (a) Draw a pyramid of biomass for the three organisms in this food chain.

Label the pyramid.

(2 marks)

4.7.4.1 Trophic levels

Question 03 · continued

for mark

1 (b) It would be more energy efficient if people ate the soya beans rather than eating the trout.

Which **two** of the following are reasons for this?

Tick (✓) **two** boxes.

Some people do not like eating animals such as trout. ☐

The trout release energy when they respire. ☐

Soya bean plants release energy when they respire. ☐

Some energy will be lost in waste from the trout. ☐

Soya bean plants absorb energy during photosynthesis. ☐

(2 marks)

1 (c) Suggest **one** advantage to the fish farmer of keeping the trout in a large net instead of letting them swim freely in the lake.

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(1 mark)

1 (d) Some trout die before they are large enough to be sold.
The dead trout contain carbon.

Use your knowledge of the carbon cycle to describe how this carbon is returned to the atmosphere after the trout die.

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(2 marks)

7

4.7.4.1 Trophic levels

Question 04

January 2011 | BLY2H | Original Q2 | Legacy

2 A group of students investigated a food chain in a garden.

The table shows the estimates of the population and biomass of some of the organisms the students found.

Organism	Number in the garden	Mean mass of each one in g	Biomass of population in g
Hedgehog	1	200	200
Slug	600	2	1200
Lettuce	20	300	

2 (a) (i) Calculate the biomass of the lettuce population.

Show clearly how you work out your answer.

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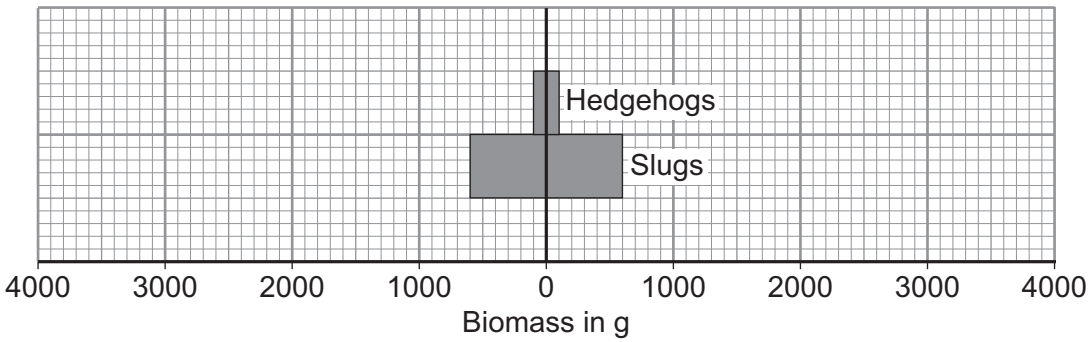
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Biomass = ... g

(2 marks)

2 (a) (ii) Use your answer to part (a)(i) to complete the pyramid of biomass.

Show the biomass of the lettuces in the garden.



(2 marks)

4.7.4.1 Trophic levels

Question 04 · continued

2 (b) Hedgehogs eat slugs.

The biomass of the hedgehog population is much less than the biomass of the slug population.

Explain why as fully as you can.

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(3 marks)

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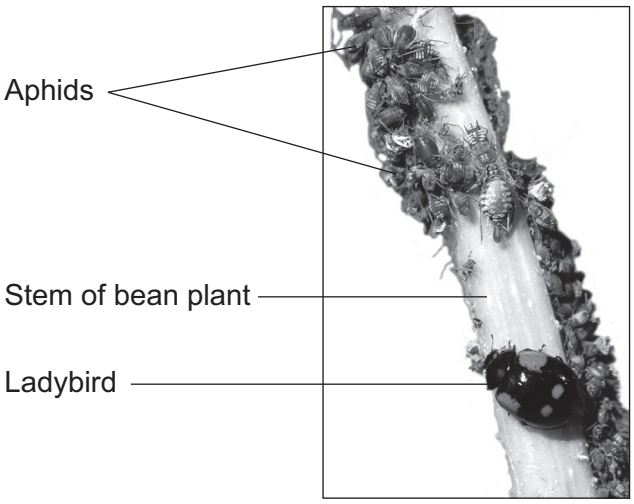
4.7.4.1 Trophic levels

Question 05

January 2012 | BL1HP | Original Q3 | Legacy

3 Students investigated a food chain in a garden.

The students found 650 aphids feeding on one bean plant.
Five ladybirds were feeding on the aphids.



3 (a) (i) Draw a pyramid of biomass for this food chain.
Label the pyramid.

(2 marks)

4.7.4.1 Trophic levels

Question 05 · continued

3 (a) (ii) The biomass in the five ladybirds is less than the biomass in the bean plant.

Give **two** reasons why.

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(2 marks)

3 (b) The carbon in dead bean plants is returned to the atmosphere via the carbon cycle.

Describe this part of the carbon cycle.

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(4 marks)

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4.7.4.1 Trophic levels

Question 06

June 2013 | BL3HP | Original Q3 | Legacy

3 There are many ways to increase the efficiency of food production.

3 (a) The table shows the energy available to humans from two different food chains.

Food chain	Energy transferred to humans in kJ per hectare of crop
Wheat → humans	900 000
Wheat → pigs → humans	90 000

3 (a) (i) Compare the amount of energy the two food chains transfer to humans.

.....

.....

(1 mark)

3 (a) (ii) Give **one** reason for the difference in the amount of energy the two food chains transfer to humans.

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.....

(1 mark)

4.7.4.1 Trophic levels

Question 06 · continued

3 (b) *In this question you will be assessed on using good English, organising information clearly and using specialist terms where appropriate.*

Give methods used in the factory farming of animals.
Explain the advantages and disadvantages of these methods.

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(6 marks)

8

4.7.4.1 Trophic levels

Question 07

June 2014 | BL1HP | Original Q1 | Legacy

1 Food chains show the flow of energy through the organisms in a habitat.

1 (a) **Figure 1** shows a food chain.

Figure 1



The biomass in each stage of the food chain changes as food passes along the food chain.

Draw a pyramid of biomass for this food chain.

Label the pyramid.

[2 marks]

4.7.4.1 Trophic levels

Question 07 · continued

1 (b) **Table 1** shows three food chains, **A**, **B** and **C**.

Table 1

	Food chain
A	plants → sheep → human
B	plants → grasshoppers → frogs → trout → human
C	plants → human

1 (b) (i) In which food chain, **A**, **B** or **C**, will the greatest proportion of biomass and energy of the plants be passed to humans? ☐

[1 mark]

1 (b) (ii) Give reasons why the food chain that you chose in part **(b)(i)** passes on the greatest proportion of biomass and energy to humans.

[3 marks]

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4.7.4.1 Trophic levels

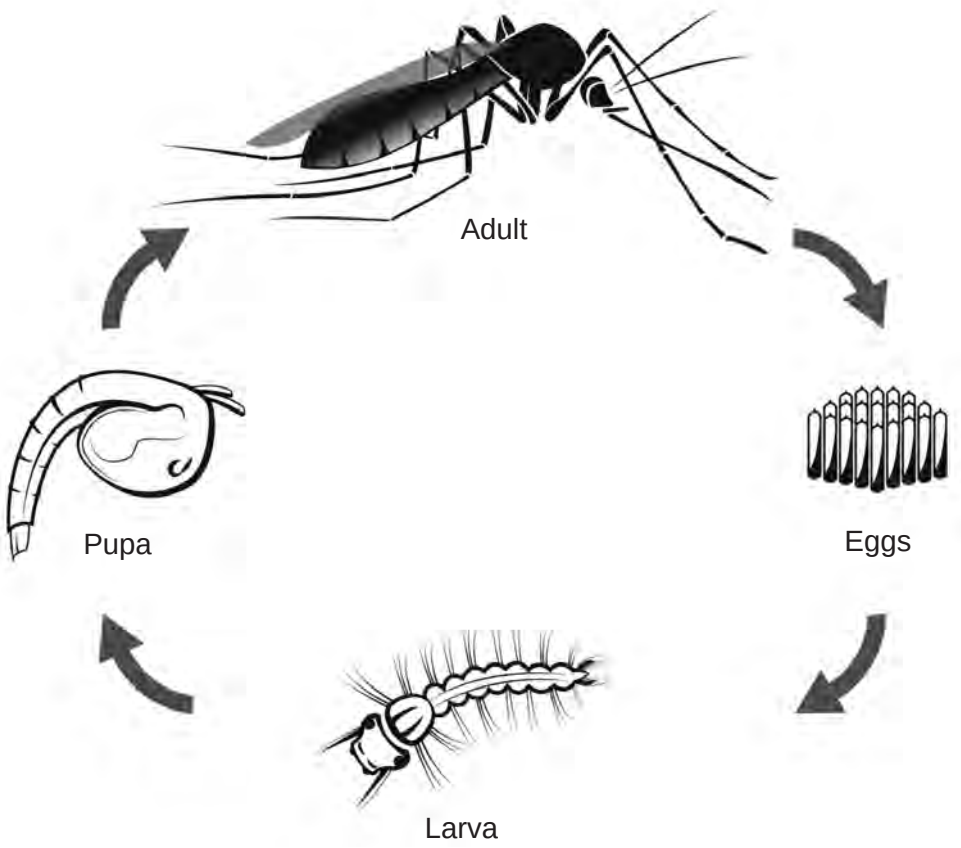
Question 08

June 2016 | BL1HP | Original Q6 | Legacy

6 Malaria is a disease caused by a microorganism carried by mosquitoes.
The microorganism is transferred to humans when adult female mosquitoes feed on human blood.

Figure 5 shows the life cycle of a mosquito.

Figure 5



The World Health Organisation estimates that 3×10^8 people are infected with malaria every year.

Scientists estimate that malaria kills 2×10^6 people every year.

The people who are infected with malaria but do not die, may be seriously ill and need health care for the rest of their lives.

6 (a) Based on the estimated figures, what percentage of people infected with malaria die from the disease?

[2 marks]

Question 08 · continued

6 (b) An internet article states:

1 Mosquito larvae are at the start of the food chain for some fish.
2 Adult mosquitoes provide food for bats and birds.
3 Mosquitoes are also important in plant reproduction because they feed from flowers of crop plants.

6 (b) (i) The first sentence in the article is **not** correct.

Explain why.

[2 marks]

6 (b) (ii) A company plans to produce genetically modified (GM) adult male mosquitoes. The GM mosquitoes will carry a gene from bacteria. The gene causes the death of offspring before they become adults.

Male mosquitoes do **not** feed on blood.
Scientists are considering releasing millions of adult male GM mosquitoes into the wild.

Do you think scientists should release millions of male GM mosquitoes into the wild?

In your answer you should give advantages and disadvantages of releasing GM mosquitoes into the wild.

[4 marks]

Question 6 continues on the next page

4.7.4.1 Trophic levels

Question 08 · continued

6 (b) (iii) Describe the process for creating a GM mosquito.

[3 marks]

11

4.7.4.1 Trophic levels

Question 09

June 2016 | BL1HP | Original Q7 | Legacy

7 Students investigated a food chain in a garden.

lettuce ⟶ **snail** ⟶ **thrush (bird)**

The students:

- estimated the number of lettuce plants in the garden
- estimated the number of snails feeding on the lettuces
- counted two thrushes in the garden in 5 hours.

Table 2 shows the students' results and calculations.

Table 2

Organism	Population size	Mean mass of each organism in g	Biomass of population in g	Biomass from previous organism that is lost in g	Percentage of biomass lost
Lettuce	50	120.0	6000		
Snail	200	2.5	500	5500	91
Thrush	2	85.0	170	330	66

7 (a) (i) Give **two** ways that biomass is lost along a food chain.

[2 marks]

7 (a) (ii) Scientists estimate that about 90% of the biomass in food is lost at each step in a food chain.

Suggest **one** reason why the students' value for the percentage of biomass lost between the snails and the thrushes is only 66%.

[1 mark]

Question 7 continues on the next page

7 (b) European banded snails have shells with different colours (light or dark) and with stripes or with no stripes.

Figure 6 shows two examples of European banded snails.

Figure 6



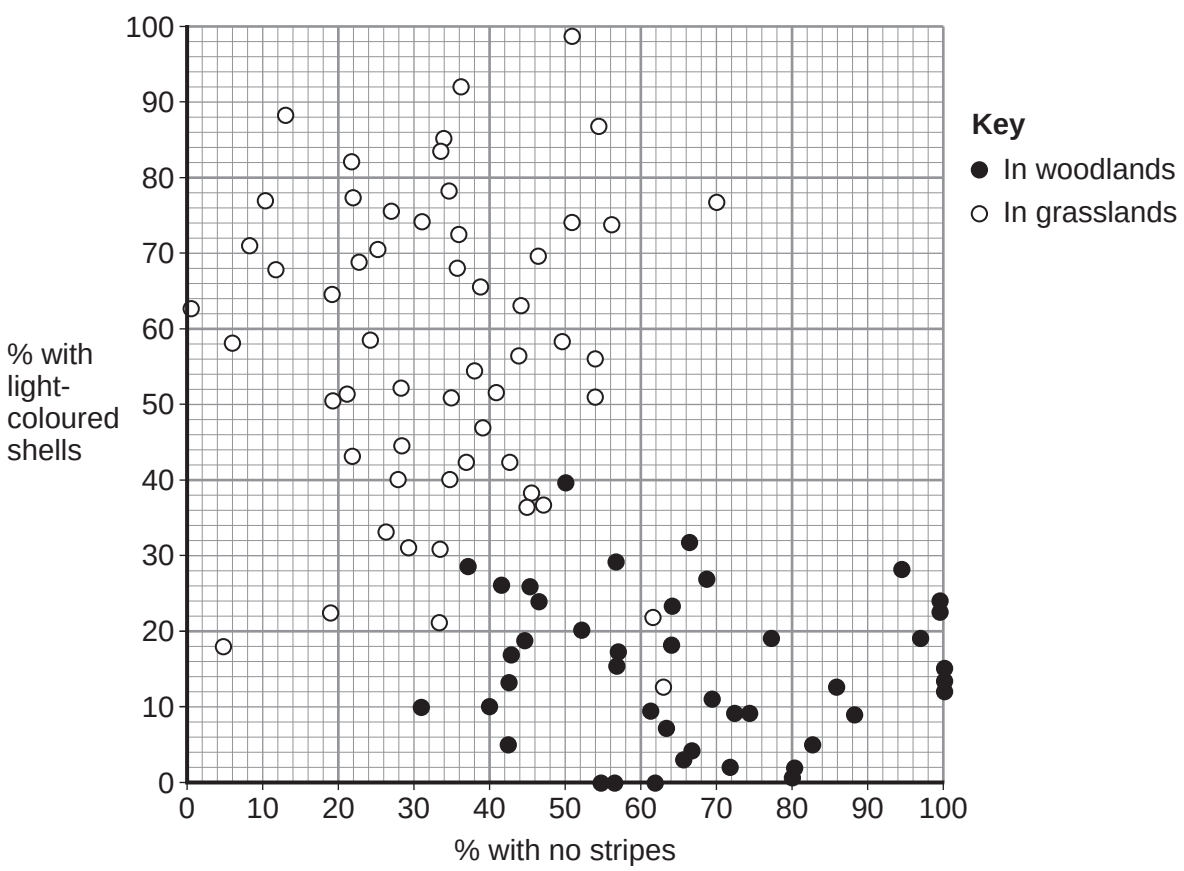
Dark-coloured shell, with stripes

Light-coloured shell, with no stripes

Figure 7 shows results from surveys in woodlands and in grasslands of the percentage of snails with light-coloured shells and the percentage of snails with no stripes.

Each point on **Figure 7** represents the results of one survey in one habitat.

Figure 7



4.7.4.1 Trophic levels

Question 09 · continued

7 (b) (i) **Figure 7** is a scatter graph.

Why is a scatter graph used for this data?

[1 mark]

_____

_____

7 (b) (ii) Compare the general appearance of snails that live in woodlands with the general appearance of snails that live in grasslands.

[2 marks]

_____

_____

_____

_____

7 (b) (iii) Suggest a reason for the general appearance of snails that live in woodlands.

[1 mark]

_____

_____

7 (c) Snails are **not** used as indicator species as they cannot give us information about pollution levels.

7 (c) (i) Name **one** type of animal that can be used as an indicator species.
State the environmental factor that the animal indicates.

[1 mark]

Indicator species _____

Environmental factor _____

7 (c) (ii) Give **one** different method of measuring the environmental factor you gave in part **(c)(i)**.

[1 mark]

_____

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9

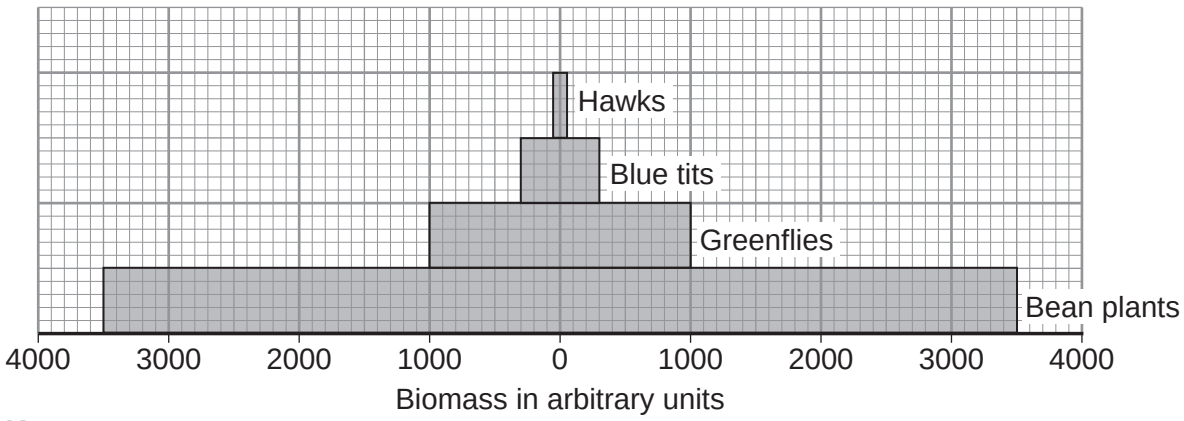
4.7.4.1 Trophic levels

Question 10

June 2017 | BL1HP | Original Q1 | Legacy

1 **Figure 1** shows a pyramid of biomass for a food chain.

Figure 1



Key

= 500 arbitrary units

1 (a) (i) Not all of the biomass of the bean plants is converted into the biomass of greenflies.

Calculate the biomass of bean plants that is **not** converted into the biomass of greenflies.

[2 marks]

Use information from **Figure 1**.

_____

_____

Biomass = _____ arbitrary units

4.7.4.1 Trophic levels

Question 10 · continued

1 (a) (ii) For every 10 grams of biomass eaten by the hawks, more than 8 grams of biomass are lost.

Give **one** way in which the biomass eaten by hawks is lost from the food chain.

[1 mark]

Tick (✓) **one** box.

Hawks reproduce ☐

Hawks produce faeces ☐

Hawks grow ☐

Hawks feed on other birds ☐

1 (b) When the bean plants grow they gain biomass.

Complete the sentences.

[2 marks]

The bean plants gain biomass by the process of _____ .

In this process, the bean plants make a carbohydrate called _____ .

5

4.7.4.1 Trophic levels

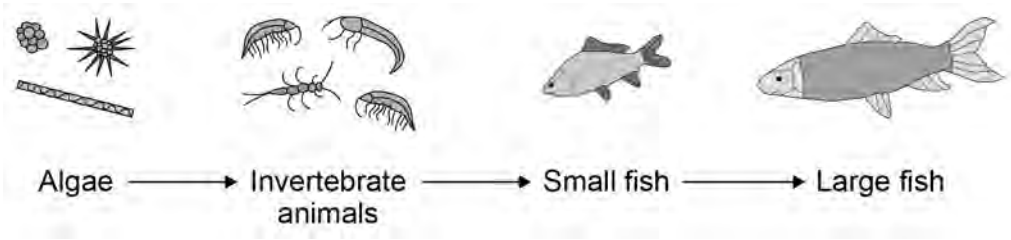
Question 11

June 2018 | 8461/2H | Original Q7

0 7 **Figure 8** shows:

- a food chain for organisms in a river
- the biomass of the organisms at each trophic level.

Figure 8



Biomass in g/m^2:	840	200	40	10

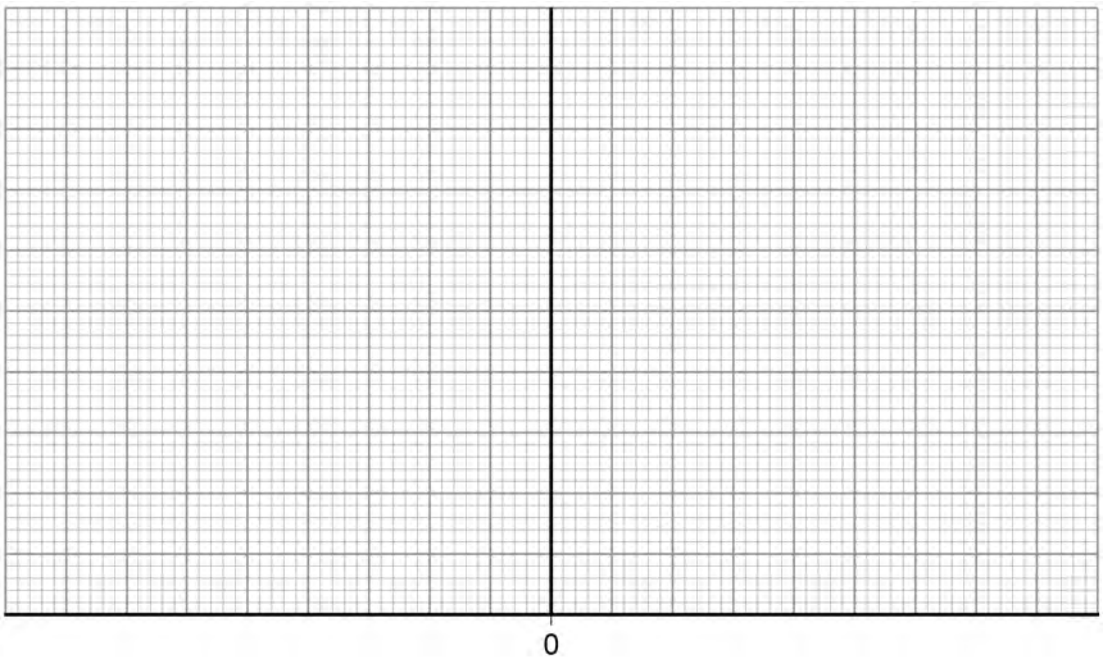
0 7 . 1 Draw a pyramid of biomass for the food chain in **Figure 8** on **Figure 9**.

You should:

- use a suitable scale
- label the x-axis
- label each trophic level.

[4 marks]

Figure 9



4.7.4.1 Trophic levels

Question 11 · continued

0 7 . 2 Calculate the percentage of the biomass lost between the algae and the large fish.

Give your answer to 2 significant figures.

[3 marks]

Percentage loss = _____

0 7 . 3 Give **one** way that biomass is lost between trophic levels.

[1 mark]

Question 7 continues on the next page

4.7.4.1 Trophic levels

Question 11 · continued

0 7 . 4 A large amount of untreated sewage entered the river. Many fish died.

Untreated sewage contains organic matter and bacteria.

Explain why many fish died.

[5 marks]

13

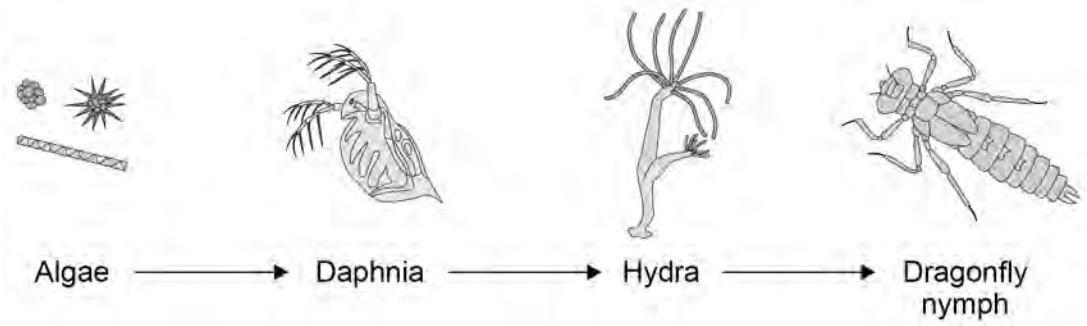
4.7.4.1 Trophic levels

Question 12

June 2019 | 8461/2H | Original Q1

0 1 **Figure 1** shows a food chain in a pond.

Figure 1



0 1 . 1 Which term describes the Daphnia in this food chain?

[1 mark]

Tick (✓) **one** box.

- Apex predator ☐
- Primary consumer ☐
- Producer ☐
- Secondary consumer ☐

4.7.4.1 Trophic levels

Question 12 · continued

0 1 . 2 Draw a pyramid of biomass for the food chain.

Label each trophic level.

[2 marks]

0 1 . 3 Give **one** reason why the total biomass of the Daphnia in the pond is different from the total biomass of the algae.

[1 mark]

_____

_____

Question 1 continues on the next page

Question 12 · continued

Students investigated the size of the population of Daphnia in the pond.

This is the method used.

1. Collect 1 dm^3 of pond water from near the edge of the pond.
2. Pour the water through a fine net.
3. Count the number of Daphnia caught in the net.
4. Repeat steps 1–3 four more times.

Table 1 shows the results.

Table 1

Sample number	Number of Daphnia in 1 dm^3 water
1	5
2	21
3	0
4	16
5	28

0 1 . 4 Calculate the mean number of Daphnia in 1 m^3 of pond water.

1 m^3 = 1000 dm^3

[2 marks]

Mean number of Daphnia in 1 m^3 of pond water = _____

4.7.4.1 Trophic levels

Question 12 · continued

0 1 . 5 The pond was a rectangular shape, measuring:

- length = 2.5 metres
- width = 1.5 metres
- depth = 0.5 metres.

Calculate the estimated number of Daphnia in the pond.

Use your answer from Question **01.4**.

Give your answer in standard form.

[4 marks]

Number of Daphnia in the pond = _____

Question 1 continues on the next page

4.7.4.1 Trophic levels

Question 12 · continued

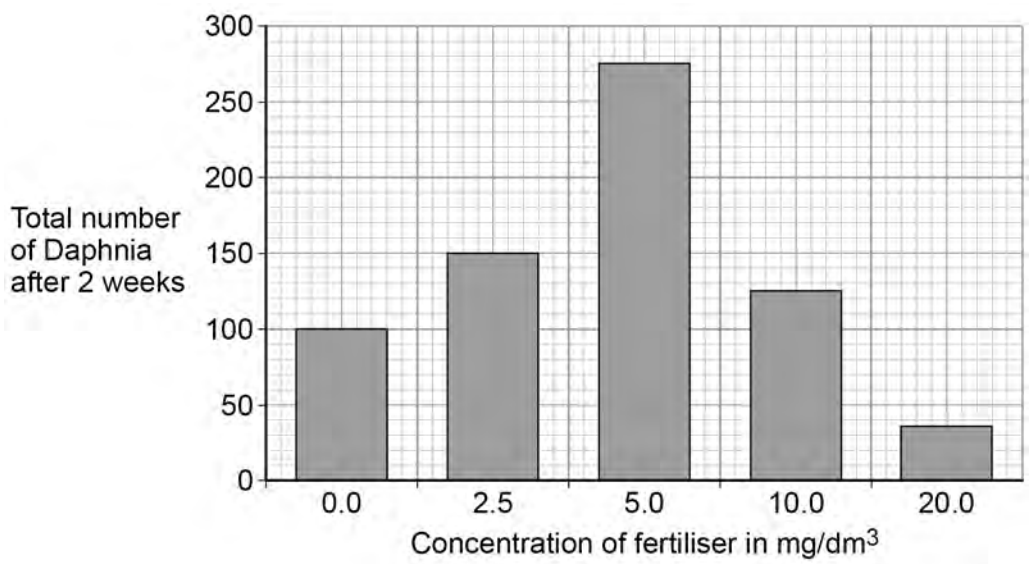
Rainfall can cause fertiliser to be washed from farmland into a pond.

The students investigated the effect of fertiliser on the population of Daphnia in water from the pond.

- The students put 20 Daphnia in each of five different concentrations of fertiliser.
- The students counted the total number of Daphnia in each concentration of fertiliser after 2 weeks.

Figure 2 shows the results.

Figure 2



0 1 . 6 A concentration of 5.0 mg/dm^3 of fertiliser caused a large increase in the population of Daphnia.

Explain why.

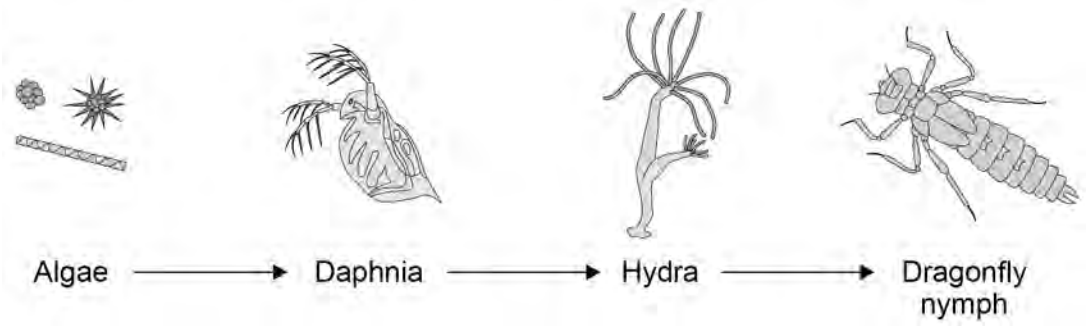
[2 marks]

4.7.4.1 Trophic levels

Question 12 · continued

0 1 . 7 **Figure 1** is repeated below.

Figure 1



The population of **Hydra** will decrease when 20 mg/dm^3 of fertiliser is added to the pond.

Explain why.

[2 marks]

14

4.7.4.1 Trophic levels

Question 13

November 2020 | 8461/2H | Original Q7

0 7 A new dog food has been developed that does **not** contain meat from cows, sheep or chickens.

The new dog food contains insects.

The insects in the dog food factory are fed on waste vegetables.

0 7 . 1 Sketch the pyramid of biomass for the food chain that produces food for dogs from insects.

Label the pyramid.

[2 marks]

0 7 . 2 Describe **two** reasons why the biomass of the insects eaten by dogs does **not** all become biomass of the dogs.

[2 marks]

1 _____

_____

2 _____

_____

4.7.4.1 Trophic levels

Question 13 · continued

0 7 . 3 Explain how making dog food from insects could improve **human** food security in the future.

[4 marks]

8

4.7.4.1 Trophic levels

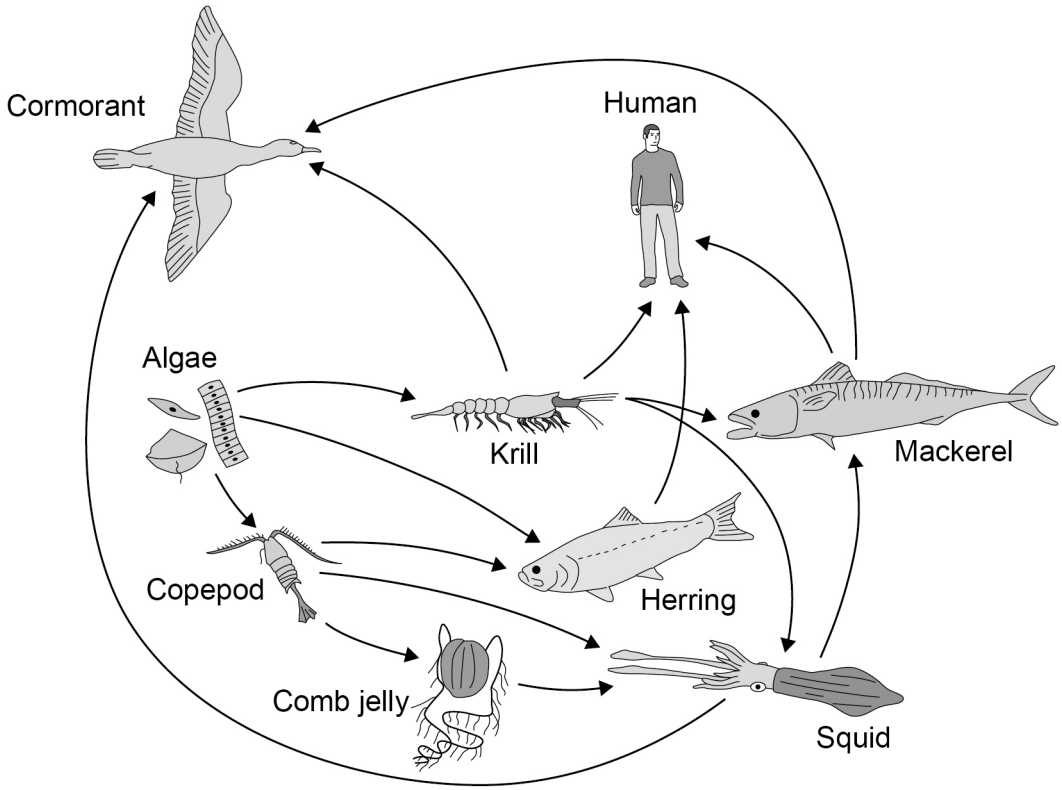
Question 14

November 2021 | 8461/2H | Original Q7

0 7 A food web contains several food chains.

Figure 9 shows a food web.

Figure 9



0 7 . 1 The animals in **Figure 9** get their energy by eating other organisms.

Describe how the algae get energy.

[2 marks]

0 7 . 2 Name **one** primary consumer in **Figure 9**.

[1 mark]

4.7.4.1 Trophic levels

Question 14 · continued

0 7 . 3 Name **one** producer in **Figure 9**.

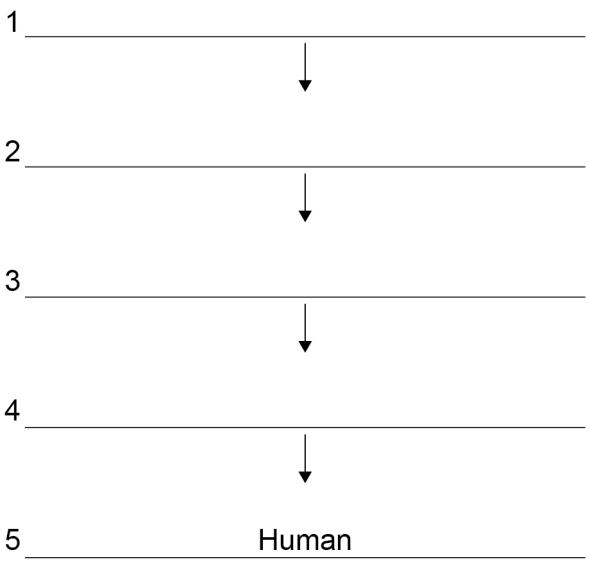
[1 mark]

0 7 . 4 The different food chains in **Figure 9** have different numbers of organisms.

Complete **Figure 10** to show a food chain in **Figure 9** with **five** organisms, including the human.

[1 mark]

Figure 10



0 7 . 5 **Figure 9** shows that mackerel eat krill and squid.

The biomass of mackerel is much less than the combined biomass of krill and squid.

One reason for this is that the mackerel cannot digest all parts of the krill and squid.

Give **two** other reasons.

[2 marks]

1

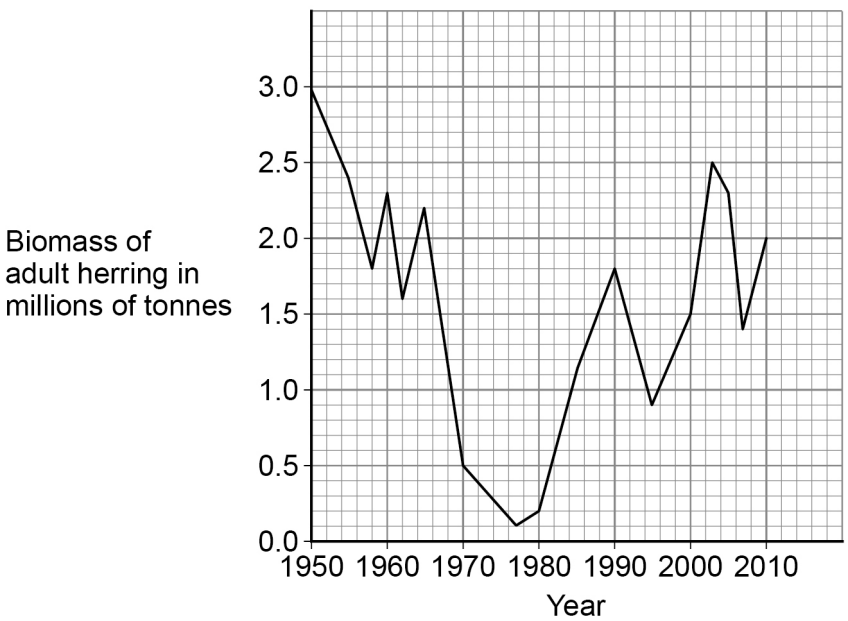
2

4.7.4.1 Trophic levels

Question 14 · continued

Figure 11 shows how the biomass of adult herring in the North Sea has changed between 1950 and 2010.

Figure 11



0 7 . 6 Calculate the percentage decrease in the biomass of herring between 1960 and 1977.

Give your answer to the nearest whole number.

[4 marks]

Percentage decrease = _____ %

Question 14 · continued

0 7 . 7 Too many herring were caught by fishermen between 1960 and 1977.

Herring can live for up to 12 years and begin to reproduce when 3 to 4 years old.

Laws have been introduced to help conserve herring:

- 1977 to 1981 – herring fishing was banned in the North Sea
- 1984 to present day – control of mesh size of fishing nets
- 1997 to present day – fishing quotas were introduced
- 1998 to present day – herring fishing was banned in breeding grounds during the breeding season.

Figure 12 shows how a minimum mesh size helps to conserve herring.

Figure 12

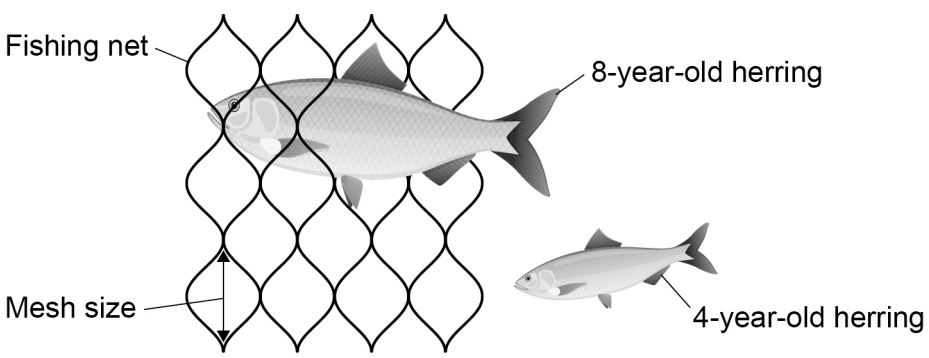
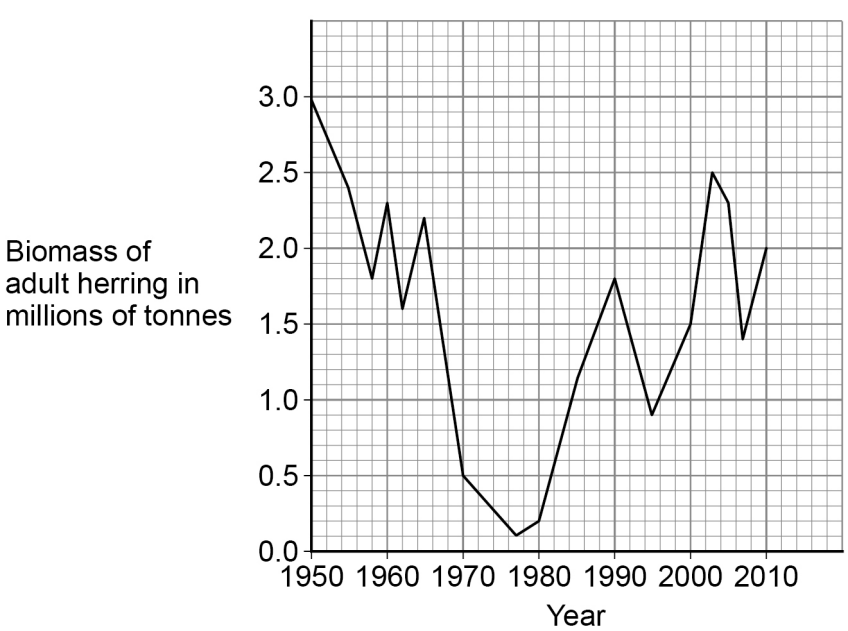


Figure 11 is repeated below.

Figure 11



4.7.4.1 Trophic levels

Question 14 · continued

Evaluate the effect of these laws on the conservation of herring stocks.

Use data from **Figure 11** and information from **Figure 12** in your answer.

[6 marks]

17

4.7.4.1 Trophic levels

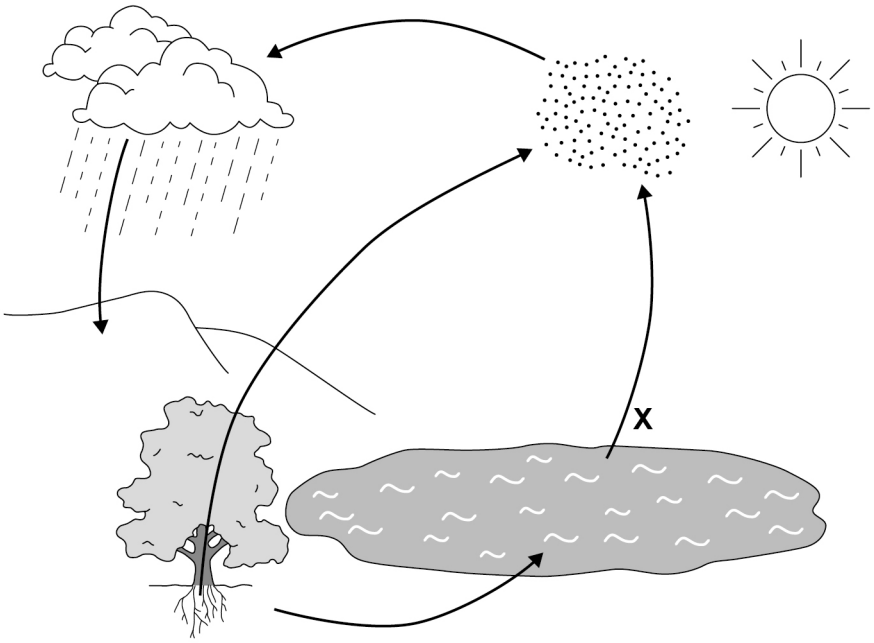
Question 15

June 2022 | 8461/2H | Original Q6

0 6 Energy flows through an ecosystem and materials are recycled.

Figure 6 shows the water cycle.

Figure 6



0 6 . 1 Name process **X**.

[1 mark]

0 6 . 2 Name the process by which water is absorbed into plant roots.

[1 mark]

0 6 . 3 Give **two** uses of water in plants.

[2 marks]

1

2

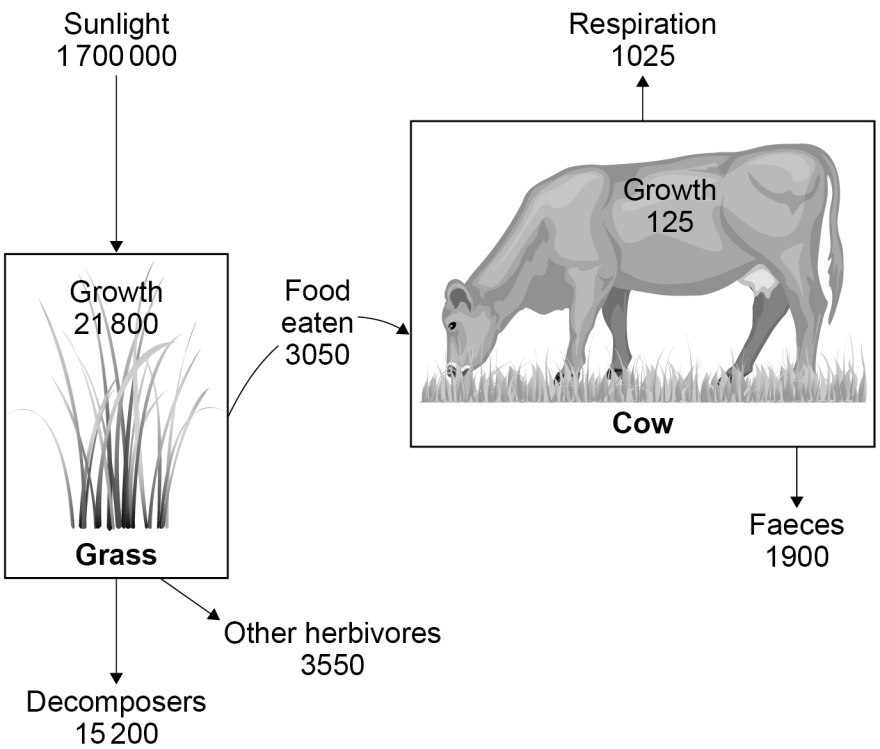
4.7.4.1 Trophic levels

Question 15 · continued

Figure 7 shows the flow of energy through a food chain.

The numbers are in kilojoules/m^2/year.

Figure 7



4.7.4.1 Trophic levels

Question 15 · continued

0 6 . 4 The cow is more efficient than the grass at converting energy.

The energy conversion efficiency of the cow is 4.098%.

Calculate how many times more efficient the cow is at converting energy than the grass.

The equation for energy conversion efficiency is:

$$\text{energy conversion efficiency} = \frac{\text{energy used for growth}}{\text{energy input}} \times 100$$

Give your answer to 3 significant figures.

[5 marks]

Number of times (3 significant figures) = _____

Question 6 continues on the next page

4.7.4.1 Trophic levels

Question 15 · continued

0 6 . 5 It is more energy-efficient to rear cows indoors than to rear cows outdoors.

Give **two** reasons why.

[2 marks]

1 _____

_____

2 _____

_____

0 6 . 6 Suggest **two** possible disadvantages of rearing cows indoors.

[2 marks]

1 _____

_____

2 _____

_____

13

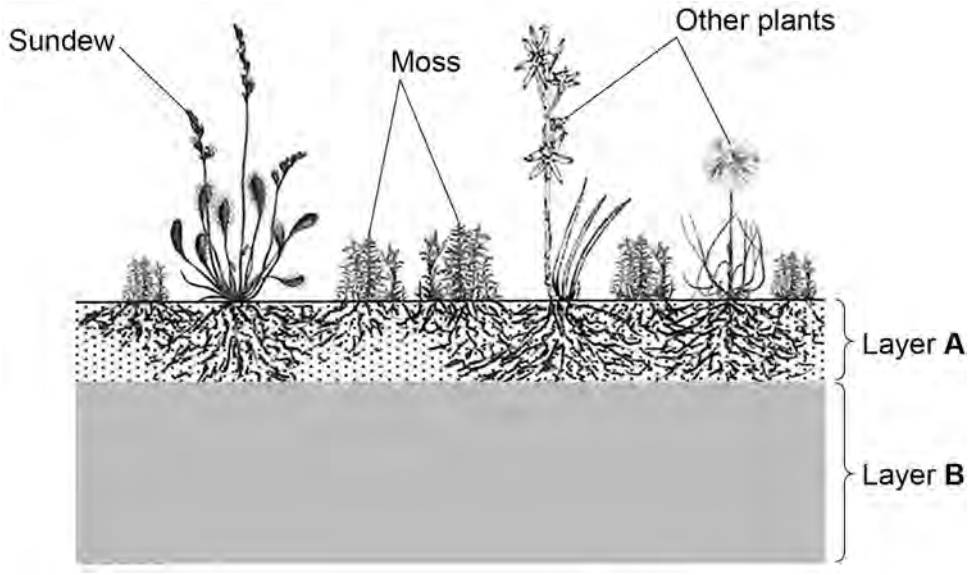
4.7.4.1 Trophic levels

Question 16

0 2 Peat bogs are estimated to contain twice as much carbon as all the world's forests.

Figure 2 shows a section through part of a peat bog.

Figure 2



Layer **A** contains a lot of air.

Layer **B**:

- contains the dead remains of plants
- has a low pH
- contains very little oxygen
- contains carbon dioxide and methane.

4.7.4.1 Trophic levels

Question 16 · continued

0 2 . 1 Explain why most of the dead remains of plants in layer **B** do **not** decay.

[3 marks]

0 2 . 2 The peat bog in **Figure 2** is a stable community.

The moss produces biomass at a rate of 340 g/m^2/year.

What is the approximate biomass of the moss that becomes biomass in primary consumers?

[1 mark]

Tick (✓) **one** box.

- 0.34 g/m^2/year ☐
- 3.4 g/m^2/year ☐
- 34 g/m^2/year ☐
- 340 g/m^2/year ☐

Question 2 continues on the next page

4.7.4.1 Trophic levels

Question 16 · continued

The sundew plant shown in **Figure 2** on page 4 has leaves with sticky hairs that trap and digest insects.

Digestion of the insects releases phosphates and simple compounds of nitrogen that are used by the sundew plant.

0 2 . 3 What substance can the sundew plant make using the **phosphates**?

[1 mark]

Tick (✓) **one** box.

- Cellulose ☐
- DNA ☐
- Glycerol ☐
- Starch ☐

0 2 . 4 What substance can the sundew plant make using the **nitrogen**?

[1 mark]

Tick (✓) **one** box.

- Fatty acid ☐
- Glucose ☐
- Lactic acid ☐
- Protein ☐

0 2 . 5 Humans have destroyed large areas of peat bog to collect peat.

The peat provides fuel and provides compost for gardeners to use.

The peat comes from layer **B** in **Figure 2** on page 4.

Layer **B**:

- contains the dead remains of plants
- has a low pH
- contains very little oxygen
- contains carbon dioxide and methane.

Figure 3 shows the removal of peat from a peat bog.

Figure 3



Explain how the destruction of peat bogs and the use of peat affects the temperature of the Earth's atmosphere.

[4 marks]

10

4.7.4.1 Trophic levels

Question 17

June 2024 | 8461/2H | Original Q7

0 7 Farmers can increase the growth rate of farm animals by controlling the animals' diets.

A farmer has 1000 chickens.

- The farmer feeds the chickens on seeds from maize plants.
- 1 hectare of land produces 16.4 tonnes of maize seeds.
- The maize seeds have an energy content of 16 MJ per kg.
- Chickens can use 80% of the energy in maize seeds.
- Each chicken needs 46 MJ of energy to grow to full size.

0 7 . 1 Calculate the area of land needed to provide enough energy from maize seeds for 1000 chickens to grow to full size.

Give your answer in m^2.

Give your answer to 3 significant figures.

1 hectare = 10 000 m^2

1 tonne = 1000 kg

[5 marks]

Area of land (3 significant figures) = _____ m^2

Question 7 continues on the next page

4.7.4.1 Trophic levels

Question 17 · continued

0 7 . 2 Another farmer produced 4200 kg of maize seeds in a field.

The farmer fed the maize to 1000 chickens.

At full size, the mean mass of one chicken was 2.2 kg.

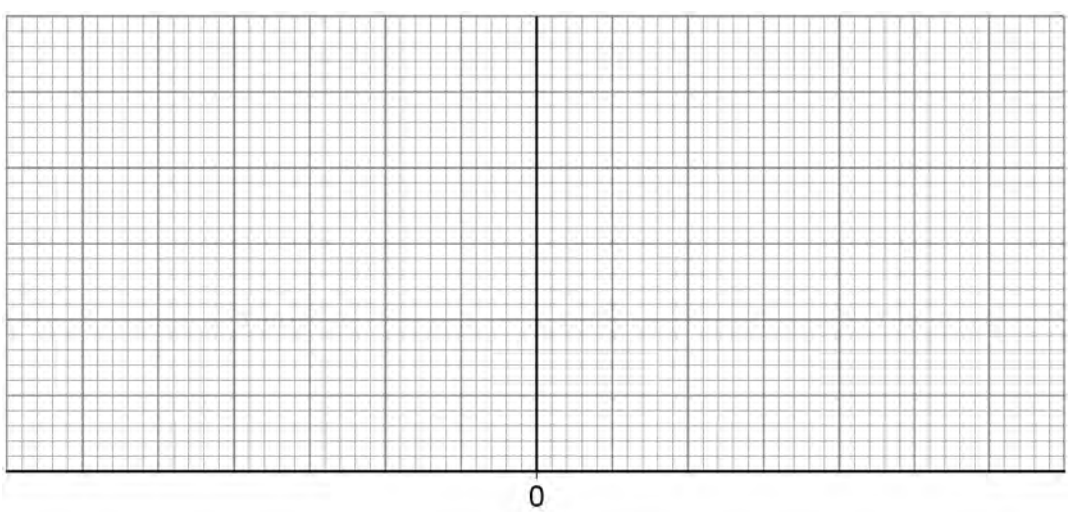
Complete **Figure 11** to show a pyramid of biomass for the food chain from the maize seeds to 1000 chickens.

[3 marks]

You should:

- label the x-axis
- use a suitable scale.

Figure 11



4.7.4.1 Trophic levels

Question 17 · continued

0 7 . 3 Calculate the ratio of chicken biomass to maize seed biomass.

Use data from Question **07.2**.

Give your answer in its simplest form.

[2 marks]

Ratio = _____ : _____

0 7 . 4 Chickens can use 80% of the biomass from the maize seeds they eat for respiration and growth.

What happens to the remaining 20% of the biomass in the maize seeds?

[1 mark]

Question 7 continues on the next page

4.7.4.1 Trophic levels

Question 17 · continued

Protein is an important part of a chicken's diet.

- Proteins contain 20 different types of amino acid.
- A chicken can make many of the 20 amino acids from other substances in the diet.
- Essential amino acids are amino acids the chicken **cannot** make.
- Essential amino acids must be included in the diet.

Maize seeds contain protein but the proportion of some essential amino acids is low.

Scientists have produced a type of maize called Quality Protein Maize (QPM).

Table 2 compares the proportions of seven essential amino acids in normal maize seeds and in QPM seeds.

Table 2

Amino acid	Mass of amino acid in protein in g/kg	
	Normal maize	Quality protein maize (QPM)
Leucine	122.2	88.1
Lysine	28.9	41.9
Methionine	19.9	18.1
Phenylalanine	49.4	40.9
Threonine	34.5	36.5
Tryptophan	7.3	16.3
Valine	45.9	51.2

4.7.4.1 Trophic levels

Question 17 · continued

0 7 . 5 Which amino acids are found in significantly higher proportions in the QPM seeds?

[1 mark]

Tick (✓) **one** box.

- Lysine and tryptophan ☐
- Lysine and valine ☐
- Threonine and tryptophan ☐
- Threonine and valine ☐

0 7 . 6 **Table 2** shows that 1 kg of QPM contains less leucine than 1 kg of normal maize.

Suggest why a diet containing less leucine does **not** slow down the growth of chickens.

[1 mark]

_____

_____

13