AQA GCSE Biology | 8461

SPECIFICATION POINT 4.7.3.5

Global warming

Past-paper questions

Tier	**Foundation**
Question groups	**33**
Available paper years	**2007–2023**

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.

4.7.3.5 Global warming

Question 01

March 2007 | BLY1B | Original Q3 | Legacy

QUESTION THREE

This question is about global warming.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A carbon dioxide

B greenhouse

C ice caps

D sea

Methane and . . . **1** . . . in the atmosphere absorb much of the energy radiated by the Earth.

This can increase the . . . **2** . . . effect and cause the Earth's atmosphere to become warmer.

An increased temperature of only a few degrees Celsius may melt the . . . **3** . . . and cause a rise in . . . **4** . . . levels.

4.7.3.5 Global warming

Question 02

June 2007 | BLY1B | Original Q2 | Legacy

QUESTION TWO

The burning of forests to create more land for growing rice is affecting the environment.

Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A biodiversity

B carbon dioxide

C energy

D methane

Forests remove . . . **1** . . . from the atmosphere.

Cutting down forests reduces the amount of . . . **2** . . . .

Growing more rice is increasing the amount of . . . **3** . . . in the atmosphere.

The greenhouse effect is caused by the re-radiation of . . . **4** . . . back to the Earth.

4.7.3.5 Global warming

Question 03

November 2007 | BLY1B | Original Q1 | Legacy

QUESTION ONE

This question is about pollution.

Match substances, **A**, **B**, **C** and **D**, with the numbers **1–4** in the table.

A carbon dioxide

B sewage

C pesticide

D sulfur dioxide

	Information
1	used in farming to kill insects
2	large quantities are released by some cities into the sea
3	dissolves in rainwater to form acid rain
4	a greenhouse gas released by burning timber

4.7.3.5 Global warming

Question 04

November 2007 | BLY1B | Original Q9 | Legacy

QUESTION NINE

This question is about global warming.

9A Methane contributes to global warming.

Which human activity has increased the release of methane into the atmosphere?

1 deforestation

2 growing more rice

3 producing more sewage

4 producing more smoke from industries

9B How does an increase in greenhouse gases in the atmosphere contribute to an increase in global temperature?

1 More of the radiation from the Sun is trapped in the atmosphere.

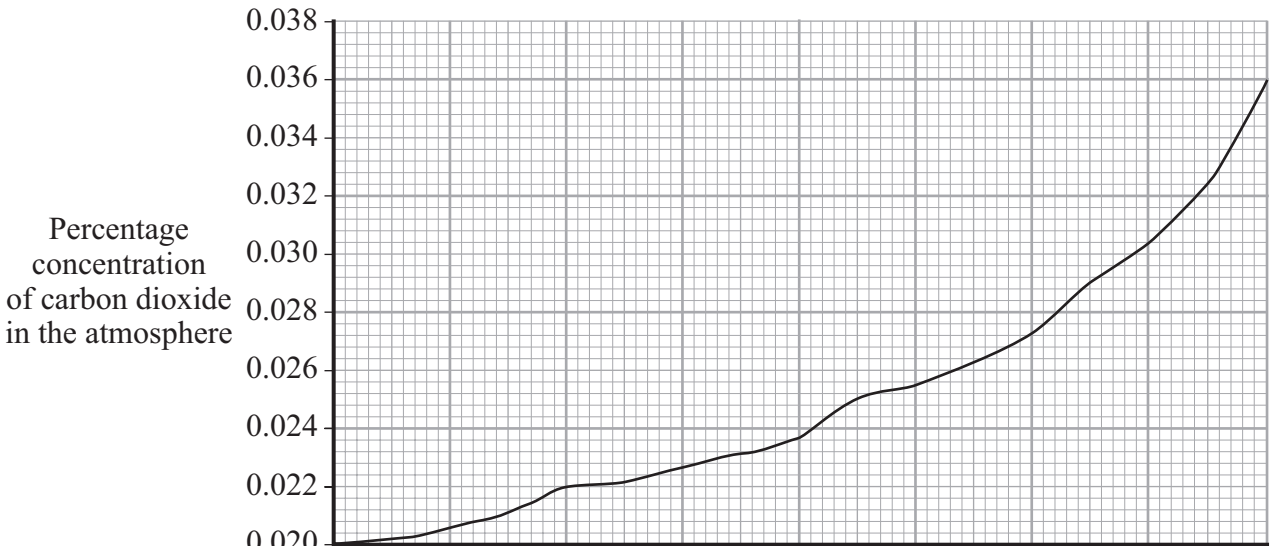
2 The atmosphere radiates more heat back to the Earth.

3 The Earth radiates more heat back into the atmosphere.

4 The Earth absorbs more heat from the Sun.

Graph 1 shows the changes in carbon dioxide concentration in the atmosphere between 1840 and 2000.

Graph 1



Question 04 · continued

9C The average increase in the percentage concentration of carbon dioxide in the atmosphere between 1880 and 2000 was . . .

1 0.000012% per year

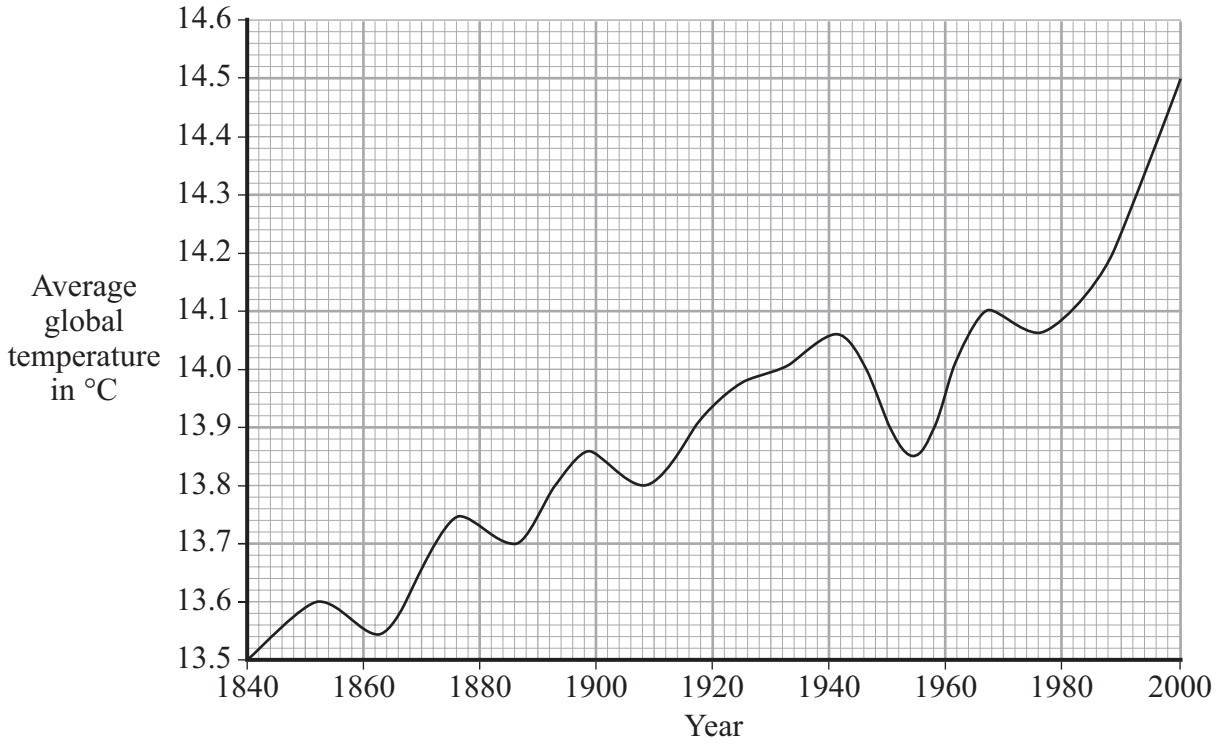
2 0.00013% per year

3 0.00012% per year

4 0.014% per year

Graph 2 shows the changes in the average global temperature between 1840 and 2000.

Graph 2



9D The data from **Graph 1** and **Graph 2** suggests that . . .

1 there is no link between carbon dioxide concentration and global temperature.

2 carbon dioxide causes global warming.

3 there may be an association between carbon dioxide concentration and global temperature.

4 global temperature varies too much to draw a conclusion.

END OF TEST

4.7.3.5 Global warming

Question 05

June 2008 | BLY1F | Original Q7 | Legacy

7 Governments are encouraging businesses to reduce carbon dioxide emissions.

7 (a) (i) Explain the link between carbon dioxide emissions and the greenhouse effect.

.....

.....

.....

.....

.....

(2 marks)

7 (a) (ii) Give **one** possible outcome of the greenhouse effect on the environment.

.....

.....

(1 mark)

7 (b) A large supermarket chain is advertising 'our goal is to make our business carbon neutral in the next five years'.

7 (b) (i) Why does the supermarket management think that this will attract more customers?

.....

.....

(1 mark)

7 (b) (ii) One step that the supermarket chain intends to take is to obtain as much food as possible from British sources.

Explain how this will help the environment.

.....

.....

.....

.....

.....

(2 marks)

6

4.7.3.5 Global warming

Question 06

November 2008 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

This question is about pollutants.

Match words, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A herbicide

B methane

C sulfur dioxide

D carbon dioxide

1	can cause acid rain
2	a greenhouse gas produced mainly by rice and cattle
3	used by farmers to kill weeds
4	a greenhouse gas taken in by plants

4.7.3.5 Global warming

Question 07

June 2009 | BLY1BP | Original Q7 | Legacy

QUESTION SEVEN

Methane is a greenhouse gas.

7A The methane in the atmosphere is produced mainly by . . .

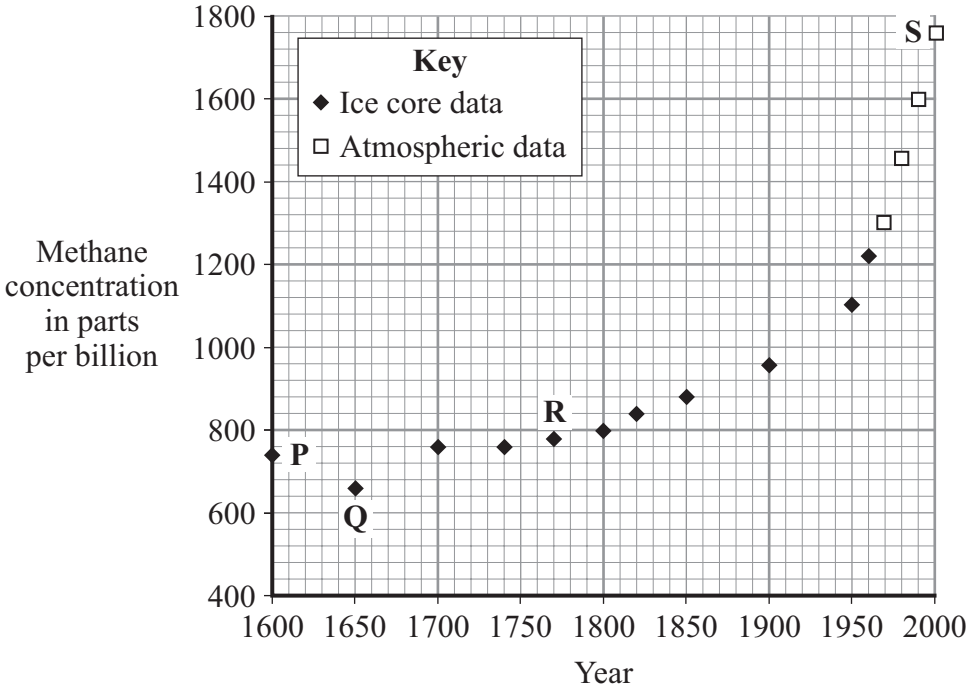
1 grass fields.

2 rice fields.

3 forests.

4 oceans.

The graph shows how the concentration of methane in the atmosphere changed between 1600 and 2000.



7B Which data point on the graph seems to be anomalous?

1 **P**

2 **Q**

3 **R**

4 **S**

4.7.3.5 Global warming

Question 07 · continued June 2009 | BLY1BP | Original Q7 | Legacy

7C Between 1600 and 2000, the concentration of methane in the atmosphere . . .

1 rose then fell.

2 rose at a constant rate.

3 rose slowly at first, then more rapidly.

4 rose rapidly at first, then more slowly.

7D The data for the years before 1970 is from air bubbles trapped in the ice in Antarctica.

The most likely reason that scientists use this data is because . . .

1 before 1970, scientists did not measure atmospheric methane concentration.

2 global warming did not begin until 1970.

3 Antarctica has been polluted in recent years, so measurements are no longer reliable.

4 it is more difficult to measure small concentrations of methane than large concentrations.

4.7.3.5 Global warming

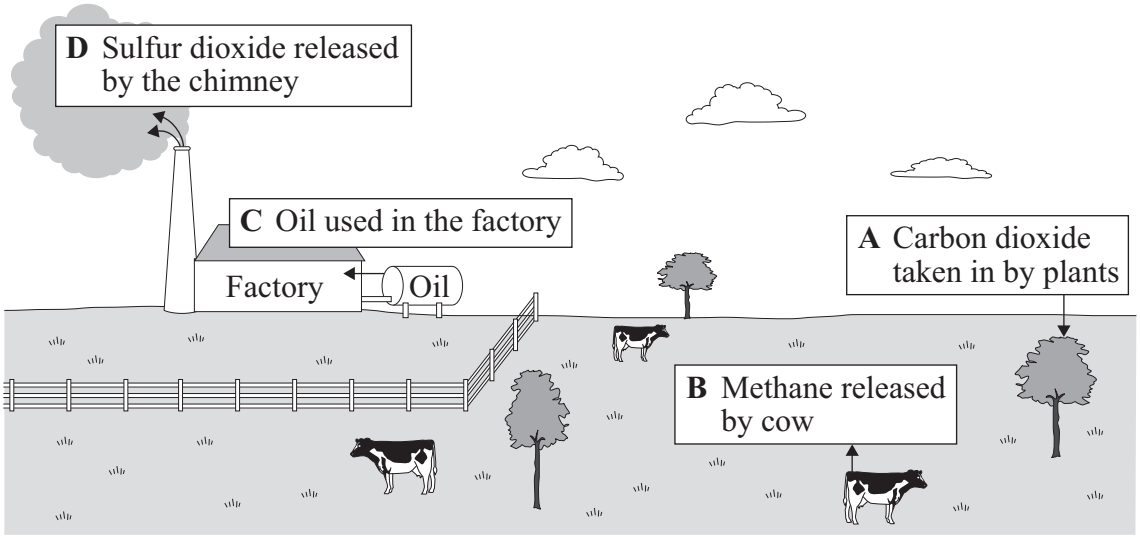
Question 08

November 2009 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

The diagram shows some of the processes occurring at a farm and the factory close by.

Match processes, **A**, **B**, **C** and **D**, with the numbers **1–4** in the table.



	Effect
1	increases global warming
2	may form acid rain
3	reduces the amount of greenhouse gas in the air
4	uses up a fuel

4.7.3.5 Global warming

Question 09

March 2010 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

The drawing shows trees being cleared to make more land for farming.



Match words, **A**, **B**, **C** and **D**, with the numbers **1–4** in the sentences.

A biodiversity

B pollution

C global warming

D deforestation

The removal of vast areas of trees is called . . . **1** . . . .

This can reduce . . . **2** . . . .

The trees no longer remove carbon dioxide from the atmosphere. This results in increased . . . **3** . . . .

The lorries used to move the trees cause air . . . **4** . . . .

4.7.3.5 Global warming

Question 10

June 2010 | BLY1BP | Original Q5 | Legacy

QUESTION FIVE

This question is about pollution and greenhouse gases.

Match organisms, **A**, **B**, **C** and **D**, with the statements **1–4** in the table.

A trees

B rice plants

C lichens

D invertebrates

	These organisms can . . .
1	be used as an indicator of air pollution.
2	be used as an indicator of water pollution.
3	'lock up' carbon dioxide for many years.
4	release methane into the atmosphere.

4.7.3.5 Global warming

Question 11

June 2010 | BLY1F | Original Q7 | Legacy

7 The photograph shows an *Anolis* lizard. This lizard lives on a tiny island.



Scientists investigated how the leg length of the *Anolis* lizards affected their survival. At the start of the investigation the *Anolis* lizards had a large range of leg lengths.

- The scientists placed six *Curly-tailed* lizards onto the island.
- The *Curly-tail* lizard is a predator of the *Anolis* lizard.
- After one year the population of *Anolis* lizards had halved.
- Nearly all the remaining *Anolis* lizards had long legs.

7 (a) Why did the population of *Anolis* lizards halve?

.....

.....

(1 mark)

7 (b) The remaining *Anolis* lizards had long legs.

Suggest an explanation for this.

.....

.....

.....

.....

.....

(2 marks)

4.7.3.5 Global warming

Question 11 · continued

7 (c) Answer each of these questions by placing a tick (✓) in the correct box.

7 (c) (i) Which theory is supported by evidence from this investigation?

Global warming	☐
Natural selection	☐
Sustainability	☐

(1 mark)

7 (c) (ii) Which scientist proposed this theory?

Darwin	☐
Lamarck	☐
Semmelweiss	☐

(1 mark)

5

4.7.3.5 Global warming

Question 12

January 2011 | BLY1F | Original Q6 | Legacy

6 The photograph shows water buffalo.
The water buffalo are being used to get a field ready for growing rice.



Draw a ring around the correct answer to complete each sentence.

6 (a) Rice crops add to global warming because rice produces

methane.
oxygen.
sulfur dioxide.

(1 mark)

6 (b) Waste from the buffalo is spread on the rice fields.

This means that the farmer needs to use less

fertiliser.
herbicide.
pesticide.

(1 mark)

6 (c) Using buffalo instead of a tractor helps to save

biodiversity.
fuel.
trees.

(1 mark)

6 (d) Global warming is caused by

acid rain.
the greenhouse effect.
toxic chemicals.

(1 mark)

4

4.7.3.5 Global warming

Question 13

March 2011 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

Humans pollute the environment.

Match words, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A carbon dioxide

B herbicide

C sulfur dioxide

D pesticide

1	the main cause of acid rain
2	a greenhouse gas taken in by plants
3	used by farmers to kill weeds
4	used by farmers to kill insects that eat crops

4.7.3.5 Global warming

Question 14

June 2011 | BLY1BP | Original Q2 | Legacy

QUESTION TWO

Human activities affect the environment.

Match activities, **A**, **B**, **C** and **D**, with the statements **1**–**4** in the table.

A burning fuels that release carbon dioxide

B building new houses

C spraying crops with pesticides

D using weedkillers on crops

	Effect on the environment
1	may damage hedges that surround fields
2	may kill useful insects such as bees
3	may cause global warming
4	may reduce the land available for wild plants

4.7.3.5 Global warming

Question 15

June 2011 | BLY1F | Original Q1 | Legacy

1 The photographs show some ways in which humans affect the environment.

1 (a) Coal-burning power stations give off smoke. The smoke contains many different gases.



Draw a ring around the correct answer to complete each sentence.

1 (a) (i) The gas which causes global warming is

carbon dioxide.
oxygen.
sulfur dioxide.

(1 mark)

1 (a) (ii) The gas which causes acid rain is

methane.
oxygen.
sulfur dioxide.

(1 mark)

1 (b) The photograph shows a quarry.



4.7.3.5 Global warming

Question 15 · continued

Draw a ring around the correct answer to complete each sentence.

1 (b) (i) Quarrying

- releases methane into the atmosphere.
- increases biodiversity.
- reduces land available for animals and plants.

(1 mark)

1 (b) (ii) Quarrying can be reduced by recycling

- metals.
- paper.
- plastic

(1 mark)

1 (c) The photograph shows a farmer spraying fruit trees.



Chemicals in the spray kill insects on the trees.

Draw a ring around the correct answer to complete each sentence.

1 (c) (i) The spray contains

- fertiliser.
- herbicide.
- pesticide.

(1 mark)

1 (c) (ii) The chemical in the spray might also

- kill other animals.
- kill plants.
- increase biodiversity.

(1 mark)

6

4.7.3.5 Global warming

Question 16

June 2011 | BLY1F | Original Q7 | Legacy

7 Soay sheep live wild on an island off the north coast of Scotland. No people live on the island.



Over the last 25 years, the average height and mass of the wild Soay sheep have decreased.

The scientists think that climate change might have affected the size of the sheep.

7 (a) More Soay sheep are now able to survive winter than 25 years ago.

What change in the climate may have helped more Soay sheep to survive winters?

.....

.....

(1 mark)

7 (b) Complete the sentences.

7 (b) (i) Soay sheep show variation in size because of differences in their

..... .

(1 mark)

7 (b) (ii) The change in the size of the Soay sheep over 25 years can be explained by Darwin's theory of ..... .

(1 mark)

3

4.7.3.5 Global warming

Question 17

June 2011 | BLY2F | Original Q2 | Legacy

2 A gardener grows tomato plants.

The tomato plants develop yellow leaves.

2 (a) What would be the best way of improving the growth of these plants?

Tick (✓) **one** box.

Add mineral ions to the soil ☐

Water the plants more ☐

Add glucose to the soil ☐

(1 mark)

4.7.3.5 Global warming

Question 17 · continued

2 (b) Most tomatoes are grown in greenhouses.



Tomato growers alter the conditions in greenhouses to make tomato plants grow faster.

Which changes in conditions will make tomato plants grow faster?

Tick (✓) **two** boxes.

Increasing the temperature ☐

Increasing the oxygen concentration in the air ☐

Increasing the nitrogen concentration in the air ☐

Turning lights on at night ☐

(2 marks)

3

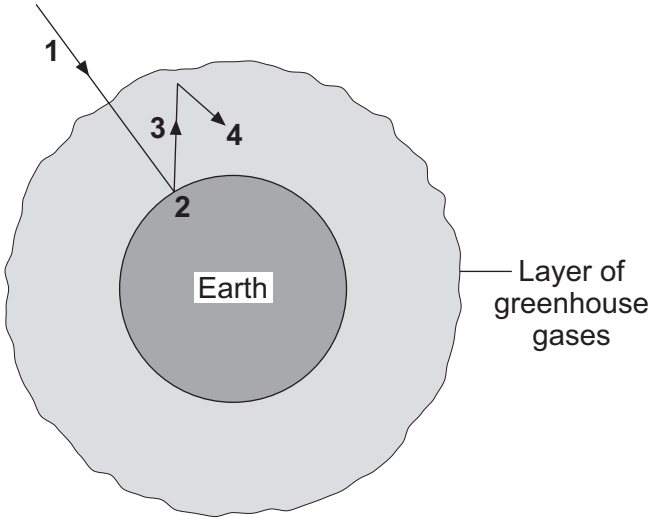
4.7.3.5 Global warming

Question 18

November 2011 | BLY1BP | Original Q3 | Legacy

QUESTION THREE

The diagram shows how the greenhouse effect works.



Match statements, **A**, **B**, **C** and **D**, with the labels **1**–**4** on the diagram.

A greenhouse gases re-radiate heat back to Earth

B energy directly from the Sun

C the Earth warms up

D heat is radiated from the Earth into the atmosphere

4.7.3.5 Global warming

Question 19

November 2011 | BLY1BP | Original Q6 | Legacy

QUESTION SIX

Scientists investigated the best number of plants of one crop to grow in trays in a greenhouse.

- Different numbers of plants were grown in trays with an area of 1 m^2.
- The soil in each tray was kept moist.
- The trays were kept in the same greenhouse.

The table shows the scientists' results.

Tray	Number of plants grown in each tray	Mass of all the stems in the tray in g	Mass of all the leaves in the tray in g
U	2	1.1	0.8
V	4	2.6	1.8
W	10	4.7	2.5
X	20	7.8	4.5
Y	40	16.0	8.0
Z	80	22.6	20.8

6A Which was the independent variable in this investigation?

1 mass of leaves grown

2 number of leaves grown

3 mass of plants grown

4 number of plants grown

4.7.3.5 Global warming

Question 19 · continued

November 2011 | BLY1BP | Original Q6 | Legacy

6B What was the average (mean) mass of leaves produced per plant in tray **W**?

1 0.20 g

2 0.25 g

3 0.47 g

4 0.72 g

6C The results suggest that the more plants grown per tray, the . . .

1 greater the total mass of stems and leaves.

2 fewer plants survive.

3 shorter the plants.

4 narrower the leaves.

6D A farmer wants to grow this crop plant outside in a field.

What should the scientist do next to give the best advice to the farmer?

1 Do the investigation at different temperatures.

2 Get a different group of scientists to do the investigation.

3 Repeat the investigation, using more plants per tray.

4 Do the investigation in the farmer's field.

4.7.3.5 Global warming

Question 20

November 2011 | BLY1BP | Original Q7 | Legacy

QUESTION SEVEN

Climate change is affecting an American national park.

- Temperatures are rising and winters are becoming less severe (less cold).
- Severe winters normally kill insects which eat pine trees in the national park.
- Many pine trees are now dying.

7A The most likely reason for the increase in the death rate of the pine trees is that . . .

1 more insects are being killed by severe winters.

2 pine trees are being killed by severe winters.

3 more insects are surviving winter.

4 pine trees prefer drier conditions.

7B Pine trees produce lots of pine seeds.

The seeds are food for squirrels and nutcracker birds.

The less severe winters result in . . .

1 less competition between squirrels for mates.

2 more competition between young pine trees.

3 increased numbers of nutcracker birds.

4 increased competition for pine seeds between squirrels and nutcracker birds.

7C When the pine trees die, gaps develop in the forest.

More small plants are now able to grow in the gaps on the forest floor because there is . . .

1 more competition for water.

2 less competition for light.

3 more competition for growing space.

4 less competition for mates.

4.7.3.5 Global warming

Question 20 · continued

7D The long-term result of the less severe winters could be that some species of animal in the forest will become extinct.

Extinction means that . . .

1 there will be a decrease in the number of squirrels in the forest.

2 there will be a decrease in the number of pine trees in the forest.

3 some animal species will die out.

4 no animals will be left in the forest.

Turn over for the next question

4.7.3.5 Global warming

Question 21

June 2012 | BL1FP | Original Q6 | Legacy

6 Insecticides are chemicals which kill insects.
Insecticides may be sprayed onto crops to increase crop yield.

6 (a) Killing insects on crops increases crop yield.

Suggest why.

.....

.....

(1 mark)

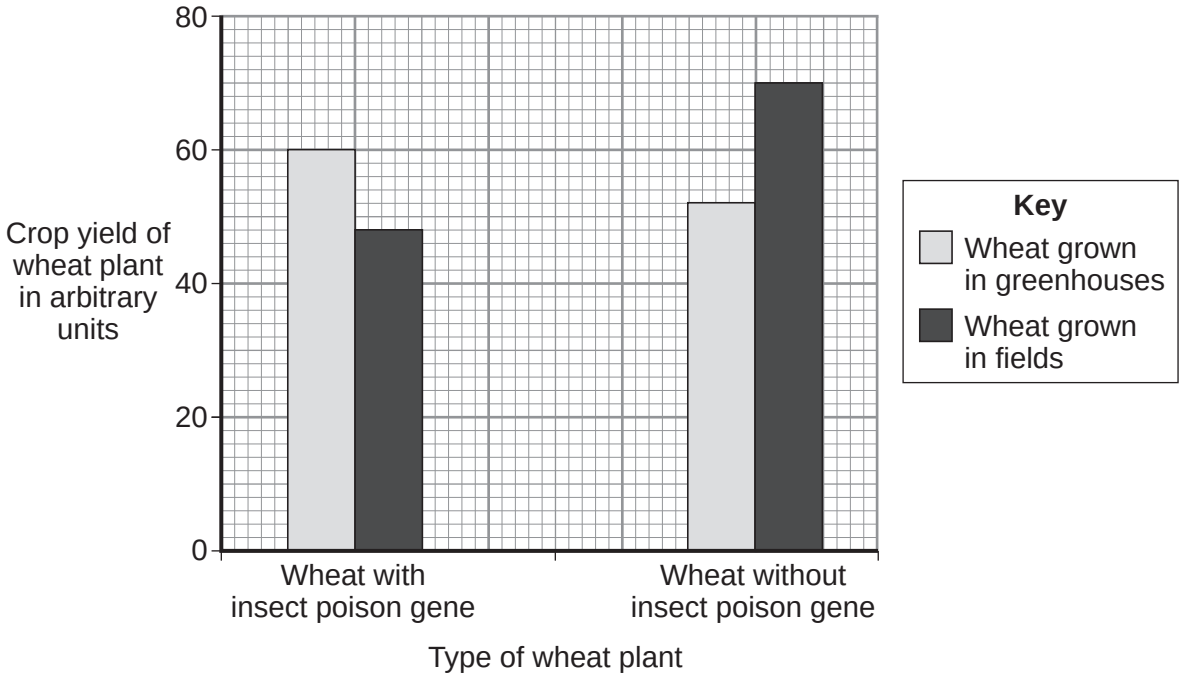
6 (b) A microorganism contains a gene which causes the production of an insect poison.

Scientists transferred the gene for production of the insect poison into wheat plants.
This makes genetically modified (GM) wheat.

The scientists:

- grew wheat plants with the insect poison gene in fields and in greenhouses
- grew wheat plants without the insect poison gene in fields and in greenhouses
- measured the crop yield of the wheat plants.

The bar chart shows the results.



6 (b) (i) What was the yield of the wheat with the insect poison gene grown in greenhouses?

..... arbitrary units
(1 mark)

4.7.3.5 Global warming

Question 21 · continued

6 (b) (ii) The yield from wheat without the insect poison gene grown in greenhouses was different from the yield you gave in **(b)(i)**.

Describe this difference in yield.

.....

.....

.....

.....

(2 marks)

6 (b) (iii) Look again at the bar chart.

What advice would you give to a farmer about the type of wheat to grow in fields?

Give a reason for your answer.

.....

.....

.....

.....

(2 marks)

6 (c) Some people are concerned about the use of GM crops.

Why?

.....

.....

.....

.....

.....

(2 marks)

8

4.7.3.5 Global warming

Question 22

June 2012 | BL2FP | Original Q6 | Legacy

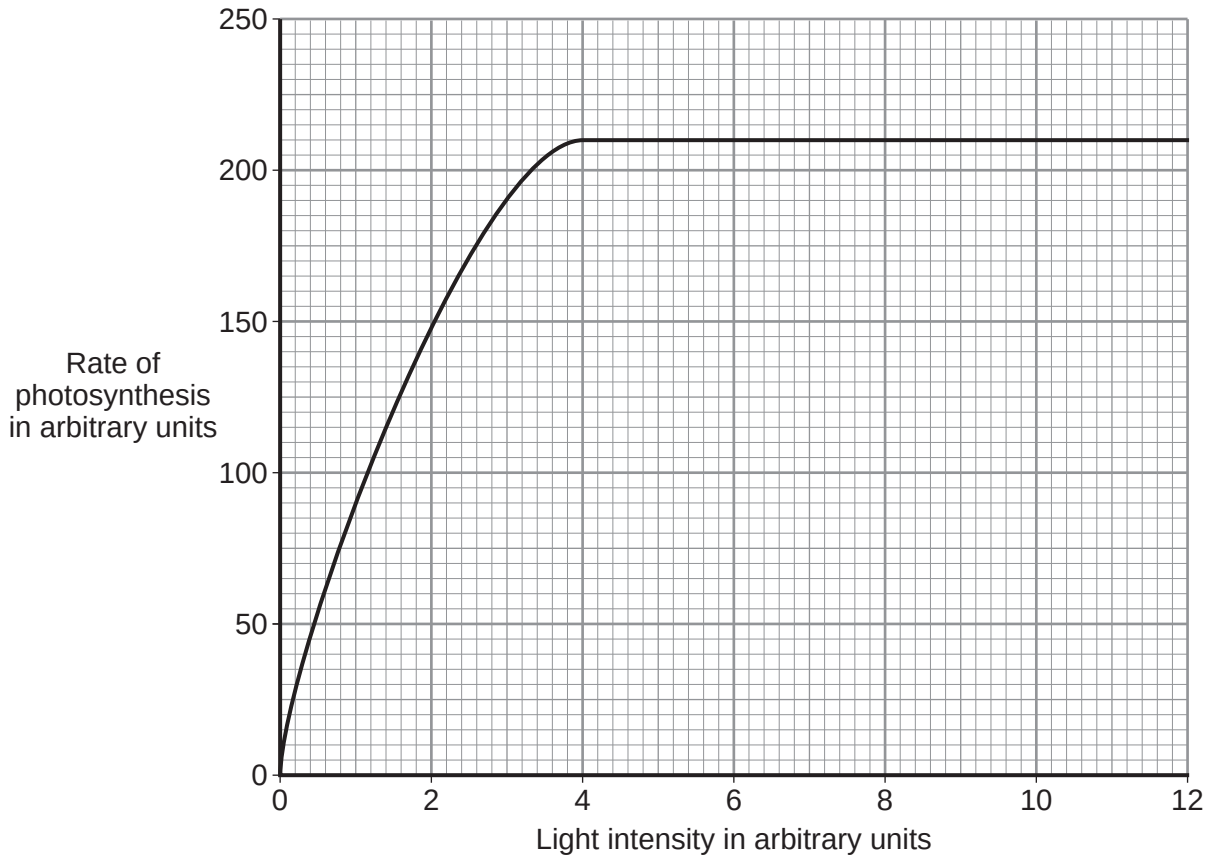
6 (a) Complete the equation for photosynthesis.

Carbon dioxide + ... $\xrightarrow{\text{light energy}}$ ..... + oxygen

(2 marks)

6 (b) A farmer grew tomato plants in a greenhouse.

The graph shows the effect of light intensity on the rate of photosynthesis in the tomato plants growing in the greenhouse.



6 (b) (i) At which light intensity was light a limiting factor for photosynthesis?

Tick (✓) **one** box.

1 arbitrary unit ☐

4 arbitrary units ☐

10 arbitrary units ☐

(1 mark)

4.7.3.5 Global warming

Question 22 · continued

6 (b) (ii) What was the highest rate of photosynthesis?

..... arbitrary units

(1 mark)

6 (b) (iii) The farmer wants to increase the rate of photosynthesis in his tomato plants.

Apart from light intensity, name **one** factor that the farmer could change to increase the rate of photosynthesis in his tomato plants.

.....

(1 mark)

5

Turn over for the next question

4.7.3.5 Global warming

Question 23

June 2013 | BL3FP | Original Q1 | Legacy

1 Human activities affect the environment.

1 (a) **List A** gives four human activities.

List B gives the effect of the activities on the environment.

Draw **one** line from each human activity in **List A** to its effect on the environment in **List B**.

List A **Human activity**	**List B** **Effect on the environment**
	Adds methane to the atmosphere
Digging a new quarry	
	Pollutes hedges around fields
Spraying pesticides on crops	
	Reduces the land available for wild animals
Growing rice	
	Produces lots of litter
Driving cars that release sulfur dioxide	
	Produces acid rain

(4 marks)

4.7.3.5 Global warming

Question 23 · continued

1 (b) Human activities are increasing *global warming*.

Give **two** effects of *global warming* on the environment.

1 .....

.....

2 .....

.....

(2 marks)

6

Turn over for the next question

4.7.3.5 Global warming

Question 24

June 2014 | BL3FP | Original Q7 | Legacy

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

Deforestation affects the environment.

Deforestation is causing a change in the amounts of different gases in the atmosphere. This change causes global warming and climate change.

Figure 11 shows an area of deforestation.

Figure 11



Give the reasons why deforestation is taking place.

Describe how deforestation is causing the change in the amounts of different gases in the atmosphere.

[6 marks]

.....

.....

.....

.....

.....

.....

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.....

.....

.....

4.7.3.5 Global warming

Question 25

June 2015 | BL2FP | Original Q4 | Legacy

4 Photosynthesis uses carbon dioxide to make glucose.

4 (a) (i) Complete the equation for photosynthesis.

[2 marks]

carbon dioxide + ... $\xrightarrow{\text{energy}}$ glucose + ...

4 (a) (ii) What type of energy does a plant use in photosynthesis?

[1 mark]

.....

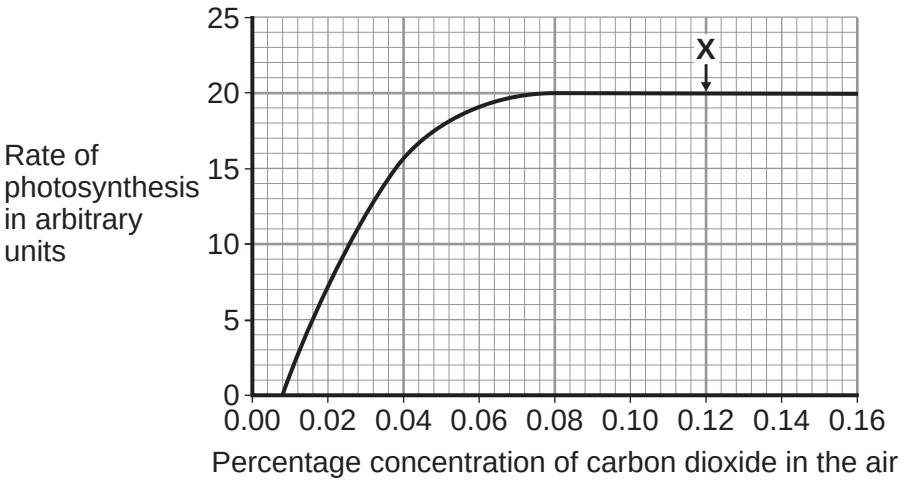
4 (a) (iii) Which part of a plant cell absorbs the energy needed for photosynthesis?

[1 mark]

.....

4 (b) **Figure 3** shows the effect of the concentration of carbon dioxide on the rate of photosynthesis in tomato plants at 20 °C.

Figure 3



4 (b) (i) What is the maximum rate of photosynthesis of the tomato plants shown in **Figure 3**?

[1 mark]

..... arbitrary units

4 (b) (ii) At point **X** on **Figure 3**, carbon dioxide is **not** a limiting factor of photosynthesis.

Suggest **one** factor that is limiting the rate of photosynthesis at point **X**.

[1 mark]

.....

4.7.3.5 Global warming

Question 25 · continued

4 (c) A farmer plans to grow tomatoes in a large greenhouse.

The concentration of carbon dioxide in the atmosphere is 0.04%.
The farmer adds carbon dioxide to the greenhouse so that its concentration is 0.08%.

4 (c) (i) Why does the farmer use 0.08% carbon dioxide?

[1 mark]

Tick (✓) **one** box.

- To increase the rate of growth of the tomato plants ☐
- To increase the rate of respiration of the tomato plants ☐
- To increase water uptake by the tomato plants ☐

4 (c) (ii) Why does the farmer **not** use a concentration of carbon dioxide higher than 0.08%?

[2 marks]

Tick (✓) **two** boxes.

- Because it would cost more money than using 0.08% ☐
- Because it would decrease the temperature of the greenhouse ☐
- Because it would not increase the rate of photosynthesis of the tomato plants any further ☐
- Because it would increase water loss from the tomato plants ☐

9

4.7.3.5 Global warming

Question 26

June 2016 | BL3FP | Original Q6 | Legacy

6 Human activity affects ecosystems.

6 (a) Draw **one** line from each human activity to the effect on ecosystems.

[2 marks]

Human activity	Effect on ecosystems
Increase in rice fields	Increases the amount of methane in the atmosphere
Destruction of peat bogs	Increases the amount of carbon dioxide that is released into the atmosphere
	Reduces the rate at which carbon dioxide is locked up as wood

6 (b) (i) Deforestation also affects the atmosphere.

Give **two** reasons why deforestation takes place.

[2 marks]

1 _____

_____

2 _____

_____

6 (b) (ii) Changes in the gases in our atmosphere can cause global warming.

Give **two** possible effects of a rise in the Earth's temperature.

[2 marks]

1 _____

_____

2 _____

_____

6

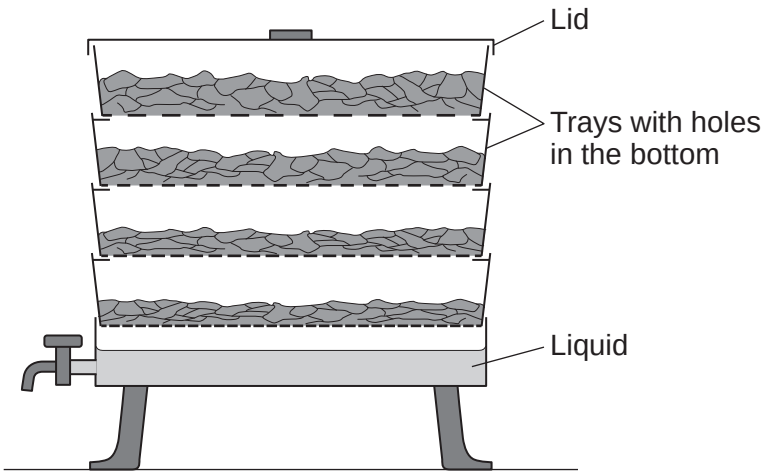
4.7.3.5 Global warming

Question 27

June 2017 | BL1FP | Original Q4 | Legacy

4 **Figure 5** shows a garden composter.

Figure 5



- The composter has four trays, with holes in the bottom of each tray.
- Material to be composted is put into the top tray.
- As the material breaks down it drops through the holes.
- The holes get smaller from the top tray to the bottom tray.

4 (a) (i) Suggest **one** type of material that could be put into the composter.

[1 mark]

_____

4 (a) (ii) How will the size of the pieces of material in the bottom tray compare with the size of the pieces of material in the top tray?

[1 mark]

Tick (✓) **one** box.

The material in the bottom tray will be in smaller pieces. ☐

The material in the bottom tray will be in larger pieces. ☐

The material in the bottom tray and the top tray will be in the same size pieces. ☐

4.7.3.5 Global warming

Question 27 · continued

June 2017 | BL1FP | Original Q4 | Legacy

4 (a) (iii) The material decomposes into soluble substances.

Name **one** type of organism that would decompose the material in the composter.

[1 mark]

_____

4 (b) Decomposition is more efficient if there is plenty of oxygen.

Suggest **one** way of changing the design of the composter to make sure that there is plenty of oxygen.

[1 mark]

_____

_____

Question 4 continues on the next page

4.7.3.5 Global warming

Question 27 · continued

4 (c) A gardener has two greenhouses, with 20 tomato plants in each greenhouse.

The gardener gives tap water to the tomato plants in one greenhouse.

The gardener gives the liquid that collects in the bottom of the composter to the tomato plants in the other greenhouse.

Table 1 shows information about the tomatoes he picks from his tomato plants.

Table 1

What was given to the plants	Mean number of tomatoes per plant	Mean mass of each tomato in g	Mean yield per plant in g
Tap water	14	85	1190
Liquid from the composter	12	125	

4 (c) (i) Suggest **one** factor the gardener will need to control to make sure the results of the investigation are valid.

[1 mark]

_____

4 (c) (ii) Use data from **Table 1** to calculate the mean yield per plant of the tomatoes which were given the liquid from the composter.

[2 marks]

_____

_____

_____

Mean yield per plant = _____ g

4 (c) (iii) The plants given the liquid from the composter produced a greater yield of tomatoes than the plants given tap water.

Suggest why.

[1 mark]

_____

_____

8

4.7.3.5 Global warming

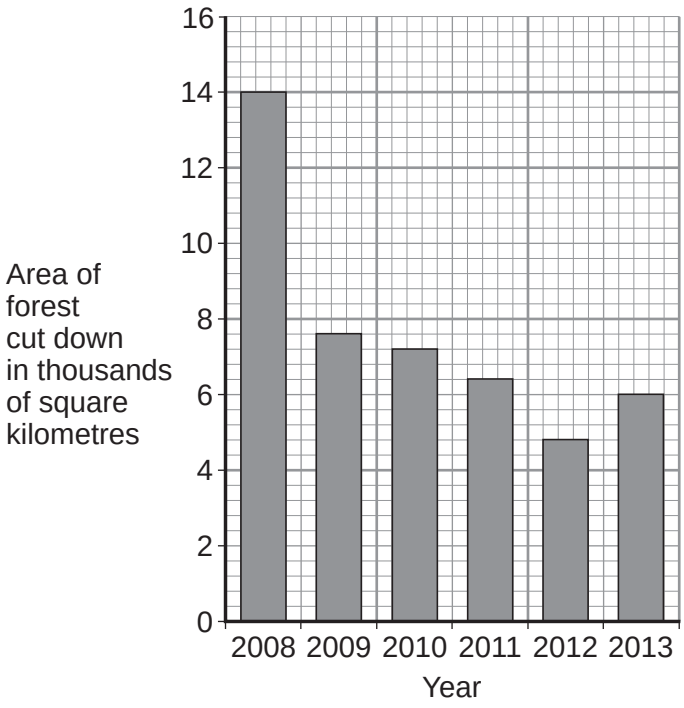
Question 28

June 2017 | BL3FP | Original Q1 | Legacy

1 Large areas of the Amazon rainforest have been cut down.

Figure 1 shows the area of forest cut down each year between 2008 and 2013 in the Amazon.

Figure 1



1 (a) (i) How many more thousand square kilometres of forest were cut down in 2008 than in 2013?

[1 mark]

Tick (✓) **one** box.

6.0 ☐

6.5 ☐

7.0 ☐

8.0 ☐

4.7.3.5 Global warming

Question 28 · continued

1 (a) (ii) Give **two** reasons why forests are cut down.

[2 marks]

Tick (✓) **two** boxes.

- To decrease global warming ☐
- To decrease the amount of sulfur dioxide released ☐
- To increase biodiversity ☐
- To provide land to grow crops ☐
- To provide space for building ☐

1 (b) Deforestation changes the concentration of gases in the atmosphere.

The changes contribute to global warming.

Which **two** gases contribute to global warming?

[2 marks]

Tick (✓) **two** boxes.

- Carbon dioxide ☐
- Hydrogen ☐
- Methane ☐
- Nitrogen ☐
- Oxygen ☐

5

4.7.3.5 Global warming

Question 29

June 2017 | BL3FP | Original Q8 | Legacy

8 Human activities pollute the air with smoke and gases.

One of these gases is sulfur dioxide.

8 (a) What effect does sulfur dioxide have on our environment?

[1 mark]

Tick (✓) **one** box.

Causes acid rain ☐

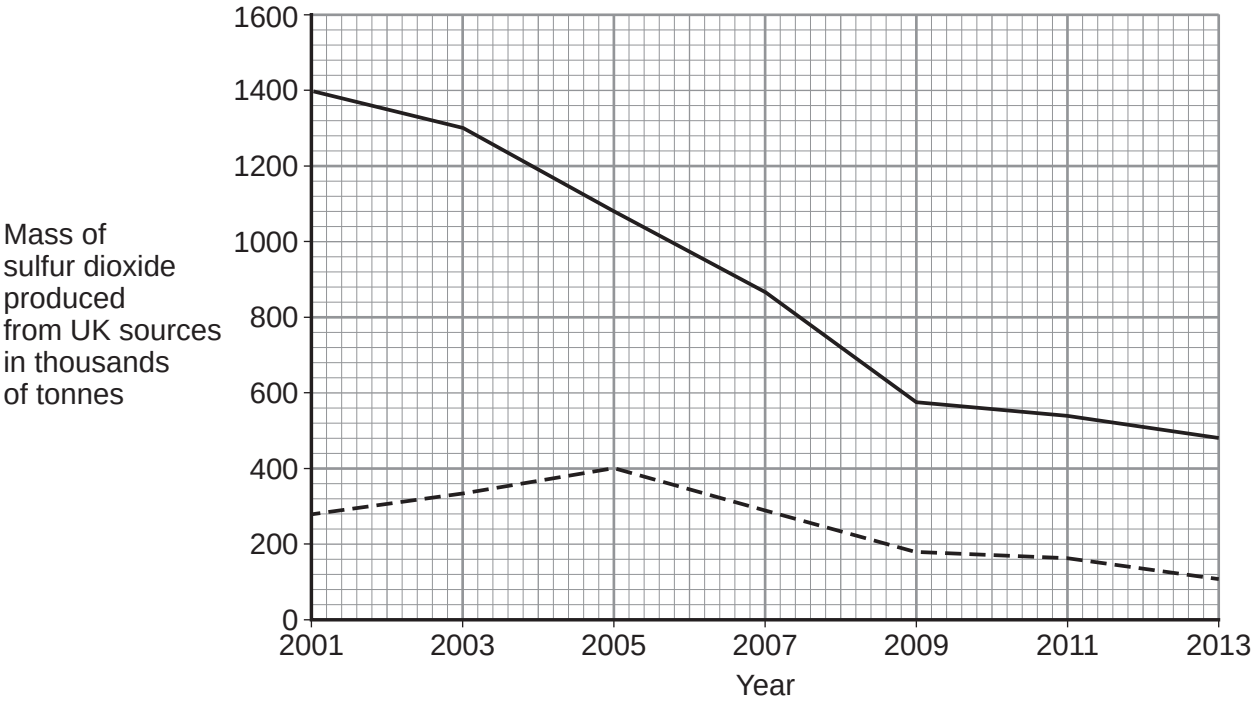
Causes global warming ☐

Causes more carbon sequestering ☐

Causes sea levels to rise ☐

8 (b) **Figure 9** shows how the mass of sulfur dioxide produced from UK sources changed from 2001 to 2013.

Figure 9



4.7.3.5 Global warming

Question 29 · continued

8 (b) (i) The mass of sulfur dioxide produced from all UK sources has decreased.

Use information from **Figure 9** to complete the following calculation of the percentage decrease in the mass of sulfur dioxide produced.

[2 marks]

Total mass of sulfur dioxide produced in 2001 = _____ thousand tonnes

Total mass of sulfur dioxide produced in 2013 = 480 thousand tonnes

Decrease in mass of sulfur dioxide produced = _____ thousand tonnes

Percentage decrease working out: _____

_____

_____

Percentage decrease = _____

8 (b) (ii) Use data from **Figure 9** to describe the pattern in the mass of sulfur dioxide produced from the UK transport industry from 2001 to 2013.

[2 marks]

_____

_____

_____

_____

5

4.7.3.5 Global warming

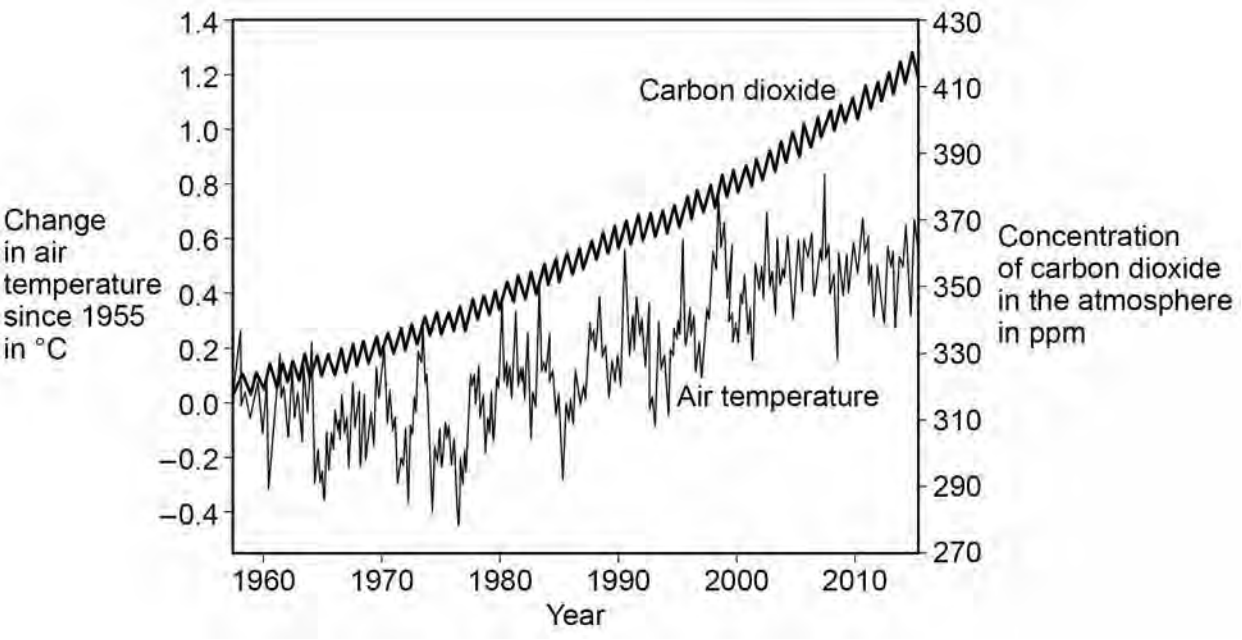
Question 30

June 2018 | 8461/2F | Original Q10

1 0 Many scientists think that global air temperature is related to the concentration of carbon dioxide in the atmosphere.

Figure 14 shows changes in global air temperature and changes in the concentration of carbon dioxide in the atmosphere.

Figure 14



1 0 . 1 Complete **Table 4**.

Use information from **Figure 14**.

[2 marks]

Choose answers from the box.

You may use each answer once, more than once or not at all.

constant	decreasing	increasing

Table 4

	1960 – 1977	1977 – 2003	2003 – 2015
Trend in carbon dioxide concentration	Increasing		
Trend in air temperature			

4.7.3.5 Global warming

Question 30 · continued

Many scientists think that an increase in carbon dioxide concentration in the atmosphere causes an increase in air temperature.

10.2 How would an increase in the concentration of carbon dioxide in the atmosphere cause an increase in air temperature?

[1 mark]

10.3 Evaluate evidence for and against the theory that an increase in the concentration of carbon dioxide in the atmosphere causes an increase in air temperature.

Use data from **Figure 14** and your own knowledge.

[4 marks]

4.7.3.5 Global warming

Question 30 · continued

June 2018 | 8461/2F | Original Q10

In each year, the concentration of carbon dioxide in the atmosphere is higher in the winter than in the summer.

10.4 Give **one** human activity that could cause the higher concentration of carbon dioxide in the winter.

[1 mark]

10.5 Give **one** biological process that could cause the lower concentration of carbon dioxide in the summer.

[1 mark]

10.6 Give **two** possible effects of an increase in global air temperature on living organisms.

[2 marks]

1

2

11

4.7.3.5 Global warming

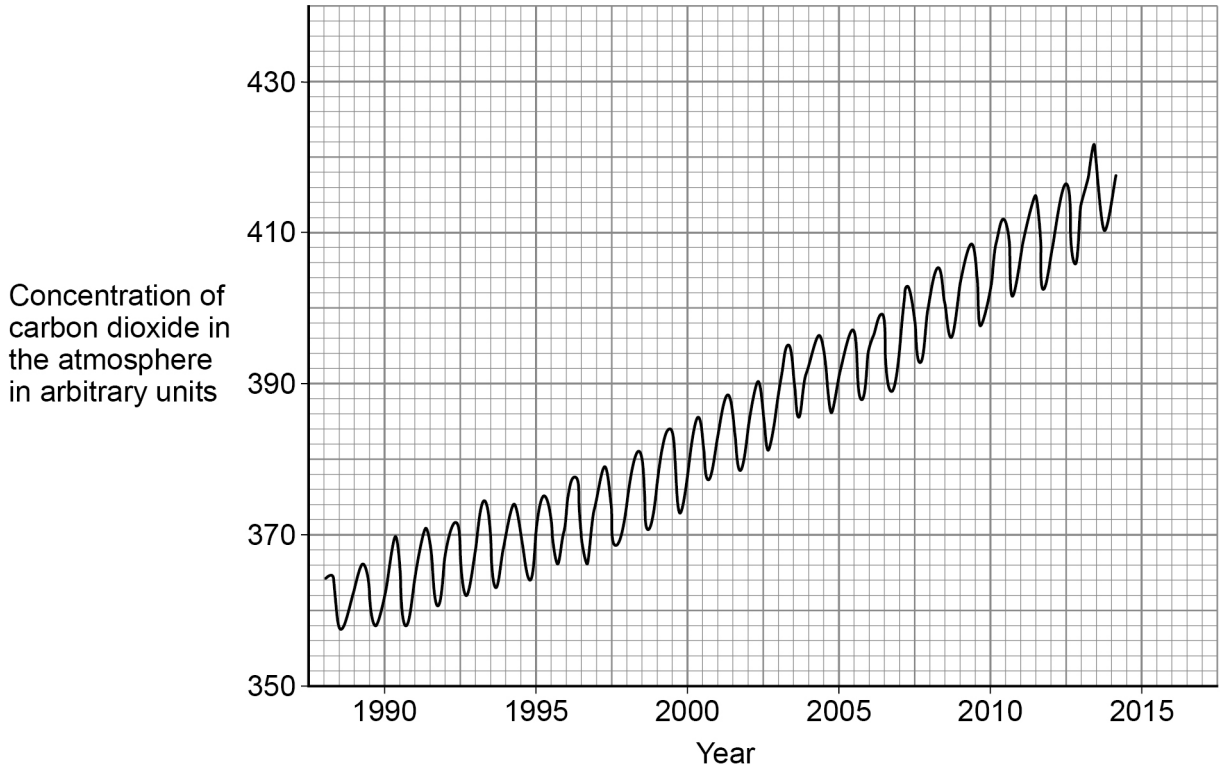
Question 31

November 2021 | 8461/2F | Original Q7

0 7 Scientists are very concerned about the changes in concentration of carbon dioxide in the Earth's atmosphere.

Figure 12 shows the concentration of carbon dioxide in the atmosphere between 1988 and 2014.

Figure 12



0 7 . 1 Describe **two** patterns shown in **Figure 12**.

Use data from **Figure 12** in your answer.

[4 marks]

1 _____

_____

_____

_____

2 _____

_____

_____

_____

4.7.3.5 Global warming

Question 31 · continued

0 7 . 2 Give **two** human activities that affect the concentration of carbon dioxide in the atmosphere.

[2 marks]

1 _____

2 _____

0 7 . 3 The trend shown in **Figure 12** may continue for many years.

Explain what effect the changing concentration of carbon dioxide in the atmosphere could have on living organisms.

[4 marks]

10

4.7.3.5 Global warming

Question 32

June 2022 | 8461/1F | Original Q3

0 3 A scientist investigated the rate of photosynthesis of one type of tomato plant.

The tomato plants were grown in a greenhouse.

Table 2 shows the results.

Table 2

Percentage (%) concentration of carbon dioxide in the air	Rate of photosynthesis in arbitrary units
0.00	0
0.02	5
0.04	16
0.06	19
0.08	20
0.10	20
0.12	20

0 3 . 1 Give **two** control variables the scientist should have used in the investigation.

[2 marks]

1 _____

2 _____

0 3 . 2 Which range of carbon dioxide concentrations caused the rate of photosynthesis to change the most?

[1 mark]

Tick (✓) **one** box.

From 0.00% to 0.02% ☐

From 0.02% to 0.04% ☐

From 0.04% to 0.06% ☐

From 0.06% to 0.08% ☐

4.7.3.5 Global warming

Question 32 · continued

0 3 . 3 How could the scientist have improved the validity of the results?

[1 mark]

Tick (✓) **one** box.

Repeat each reading three times and calculate a mean. ☐

Use concentrations of carbon dioxide above 0.12%. ☐

Use different tomato plants for each concentration. ☐

0 3 . 4 Explain the change in the rate of photosynthesis when the concentration of carbon dioxide increased between 0.00% to 0.08%.

[2 marks]

0 3 . 5 A farmer decided **not** to use a concentration of carbon dioxide higher than 0.08% to grow tomato plants.

Suggest **two** reasons for the farmer's decision.

Use information from **Table 2** and your own knowledge.

[2 marks]

1

2

8

4.7.3.5 Global warming

Question 33

June 2023 | 8461/2F | Original Q9

0 9 Reproduction can produce offspring which are:

- genetically different

  or

- genetically identical.

Farmers grow tomato plants in greenhouses.

The tomatoes are sold in supermarkets.

0 9 . 1 Suggest **one** advantage of growing tomato plants that are genetically different.

[1 mark]

0 9 . 2 Suggest **one** advantage of growing tomato plants that are genetically identical.

[1 mark]

0 9 . 3 Scientists can grow genetically identical tomato plants using tissue culture.

What is tissue culture?

[1 mark]

0 9 . 4 Genetically identical tomato plants growing in the same garden do **not** all grow to the same height.

Give **one** reason why.

[1 mark]

Question 33 · continued

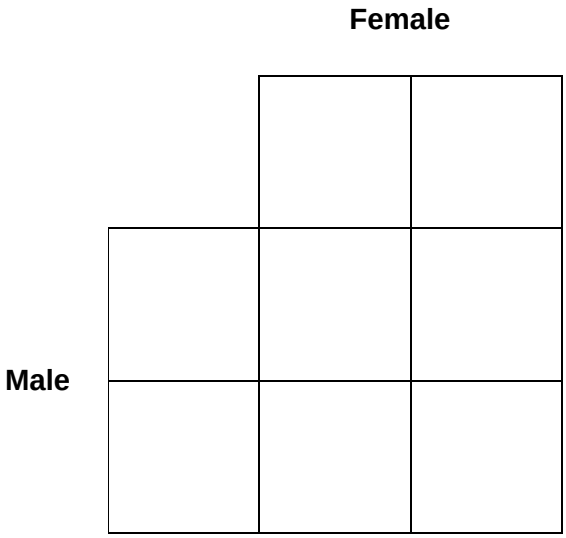
The sex of dogs is determined by **X** and **Y** chromosomes in the same way as in humans.

0 9 . 5 Complete the Punnett square diagram in **Figure 15** to show the inheritance of sex in dogs.

Use the symbols **X** and **Y**.

[3 marks]

Figure 15



0 9 . 6 A female dog gave birth to six offspring.

Why would you expect there to be three male offspring and three female offspring?

Use your answer to Question **09.5**.

[1 mark]

Question 9 continues on the next page

Question 33 · continued

Farmers keep chickens for:

- meat production
- egg production.

Some varieties of chicken grow more quickly and are more suitable for meat production.

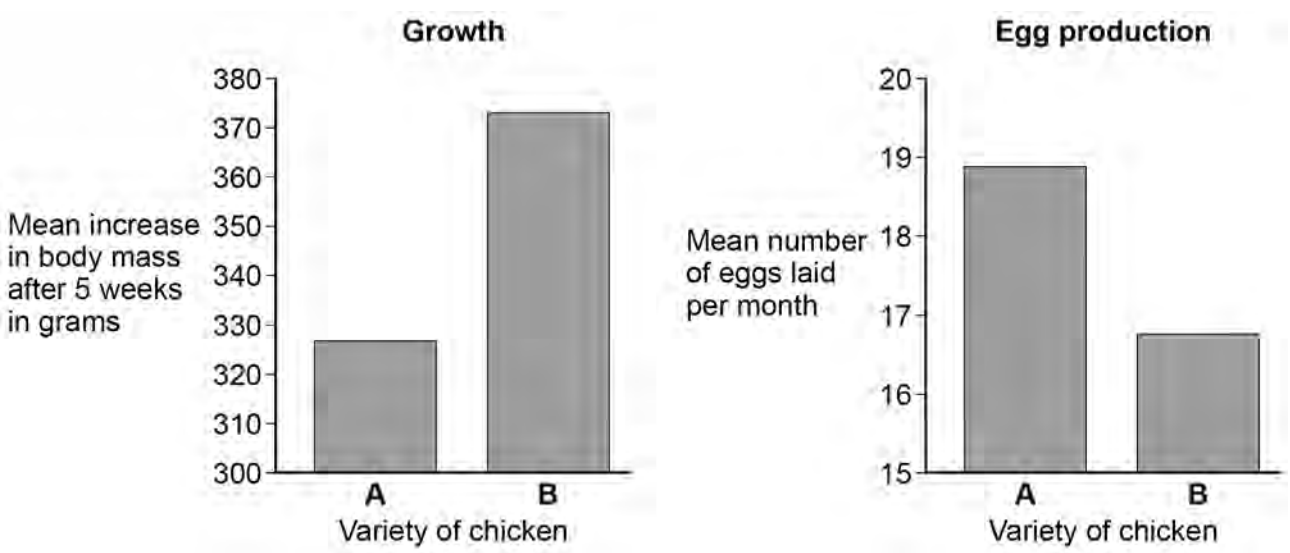
Other varieties of chicken produce more eggs.

A farmer keeps two varieties of chicken, **A** and **B**.

The farmer investigated the growth rates and egg-production rates of both varieties.

Figure 16 shows the results.

Figure 16



0 9 . 7 Suggest **two** control variables the farmer should have used in this investigation.

[2 marks]

1 _____

_____

2 _____

_____

4.7.3.5 Global warming

Question 33 · continued

0 9 . 8 **Figure 16** shows mean values from 500 chickens of each variety.

Give the reason the farmer used a large number of chickens.

[1 mark]

0 9 . 9 The farmer wants to produce a new variety of chicken that is good for **both** meat production **and** egg production.

Describe how selective breeding of chicken varieties **A** and **B** can produce the new variety of chicken.

[4 marks]

15