AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.9.1.1

The proportions of different gases in the atmosphere

Past-paper questions

Tier	**Higher**
Question groups	**3**
Available paper years	**2018–2025**

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.

5.9.1.1 The proportions of different gases in the atmosphere

Question 01

June 2018 | 8464/C/2H | Original Q2

0 2 This question is about the Earth's atmosphere.

0 2 . 1 Carbon dioxide is a greenhouse gas.

What is another greenhouse gas?

[1 mark]

Tick **one** box.

- Argon ☐
- Methane ☐
- Nitrogen ☐
- Oxygen ☐

0 2 . 2 Greenhouse gases cause global climate change.

Give **two** effects of global climate change.

[2 marks]

1 _____

_____

2 _____

_____

0 2 . 3 4.1 kg of a plastic, used to make plastic bottles, has a carbon footprint of 6.0 kg of carbon dioxide.

Calculate the carbon footprint of one plastic bottle of mass 23.5 g

[2 marks]

_____

_____

_____

_____

Carbon footprint = _____ kg of carbon dioxide

5.9.1.1 The proportions of different gases in the atmosphere

Question 01 · continued

0 2 . 4 Give **one** way that carbon dioxide emissions can be reduced when a plastic bottle is manufactured.

[1 mark]

0 2 . 5 Explain how the percentages of nitrogen, oxygen and carbon dioxide in the Earth's atmosphere today have changed from the Earth's early atmosphere.

[6 marks]

12

5.9.1.1 The proportions of different gases in the atmosphere

Question 02

November 2020 | 8464/C/2H | Original Q6

0 6 This question is about the Earth's atmosphere.

0 6 . 1 Carbon dioxide is a greenhouse gas.

The greenhouse effect happens in four stages.

The four stages are:

Stage **A** Carbon dioxide stops longer wavelength radiation escaping

Stage **B** Radiation is absorbed by the Earth

Stage **C** Longer wavelength radiation is emitted

Stage **D** Shorter wavelength radiation enters the atmosphere

What is the correct order of stages **A**, **B**, **C** and **D**?

[1 mark]

Tick (✓) **one** box.

C, **A**, **B**, **D** ☐

C, **D**, **B**, **A** ☐

D, **B**, **C**, **A** ☐

D, **C**, **B**, **A** ☐

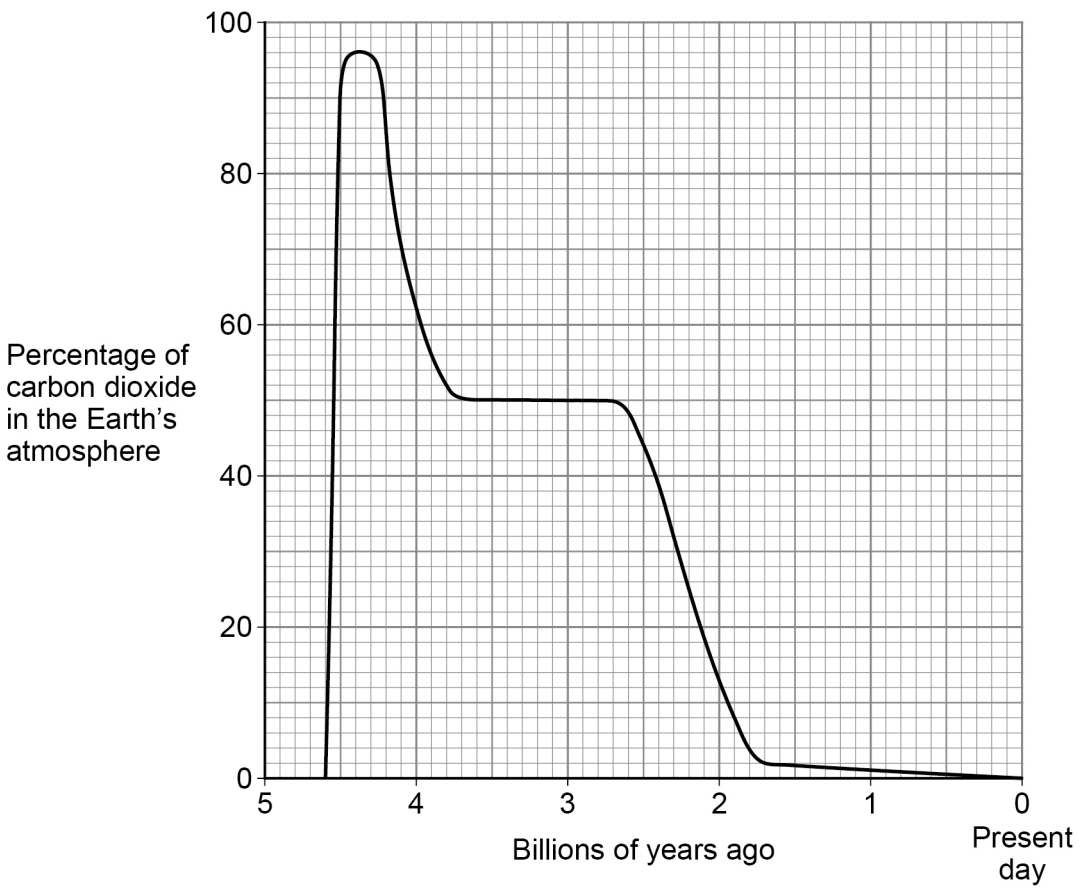
Question 6 continues on the next page

5.9.1.1 The proportions of different gases in the atmosphere

Question 02 · continued

Figure 6 shows how the percentage of carbon dioxide in the Earth's atmosphere has changed over 4.6 billion years.

Figure 6



0 6 . 2 The mass of gas in Earth's atmosphere remains constant at 5.15×10^{18} kg

Determine the maximum mass of carbon dioxide that was in the Earth's atmosphere.

Use **Figure 6**.

[3 marks]

Mass of carbon dioxide = _____ kg

5.9.1.1 The proportions of different gases in the atmosphere

Question 02 · continued

0 6 . 3 Describe the processes that have caused the main **changes** in the percentage of carbon dioxide in the Earth's atmosphere over the last 4.6 billion years.

Use **Figure 6**.

[6 marks]

10

5.9.1.1 The proportions of different gases in the atmosphere

Question 03

0 2 The proportions of most gases in the Earth's atmosphere have not changed much for the past 200 million years.

0 2 . 1 About one-fifth of the atmosphere is oxygen.

Describe the test for oxygen gas.

Give the result of the test.

[2 marks]

Test _____

_____

Result _____

_____

0 2 . 2 **Table 1** shows the percentages of some gases in the Earth's early atmosphere and in the Earth's atmosphere today.

Table 1

	Percentage (%) of gas in the atmosphere	
Gas	**Earth's early atmosphere**	**Earth's atmosphere today**
Carbon dioxide	95	0.04
Nitrogen	3	78.0
Oxygen	Less than 1	21.0

5.9.1.1 The proportions of different gases in the atmosphere

Question 03 · continued

Explain how the percentages of gases have changed from Earth's early atmosphere to Earth's atmosphere today.

You should refer to all three gases in **Table 1**.

[6 marks]

Extra space

0 2 . 3 Methane is a greenhouse gas.

Give **two** ways to reduce methane emissions into the atmosphere.

[2 marks]

1

2

5.9.1.1 The proportions of different gases in the atmosphere

Question 03 · continued

The percentage of sulfur dioxide in the Earth's atmosphere increased between 1850 and 1980.

0 2 . 4 Describe how sulfur dioxide emissions are produced.

[2 marks]

0 2 . 5 Give **one** harmful effect of sulfur dioxide emissions.

[1 mark]

0 2 . 6 Suggest **one** reason why the percentage of sulfur dioxide in the Earth's atmosphere has decreased since 1980.

[1 mark]

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