AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 5.9.1.2

The Earth's early atmosphere

Past-paper questions

Tier	**Higher**
Question groups	**4**
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.

5.9.1.2 The Earth's early 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

5.9.1.2 The Earth's early 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

5.9.1.2 The Earth's early 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** ☐

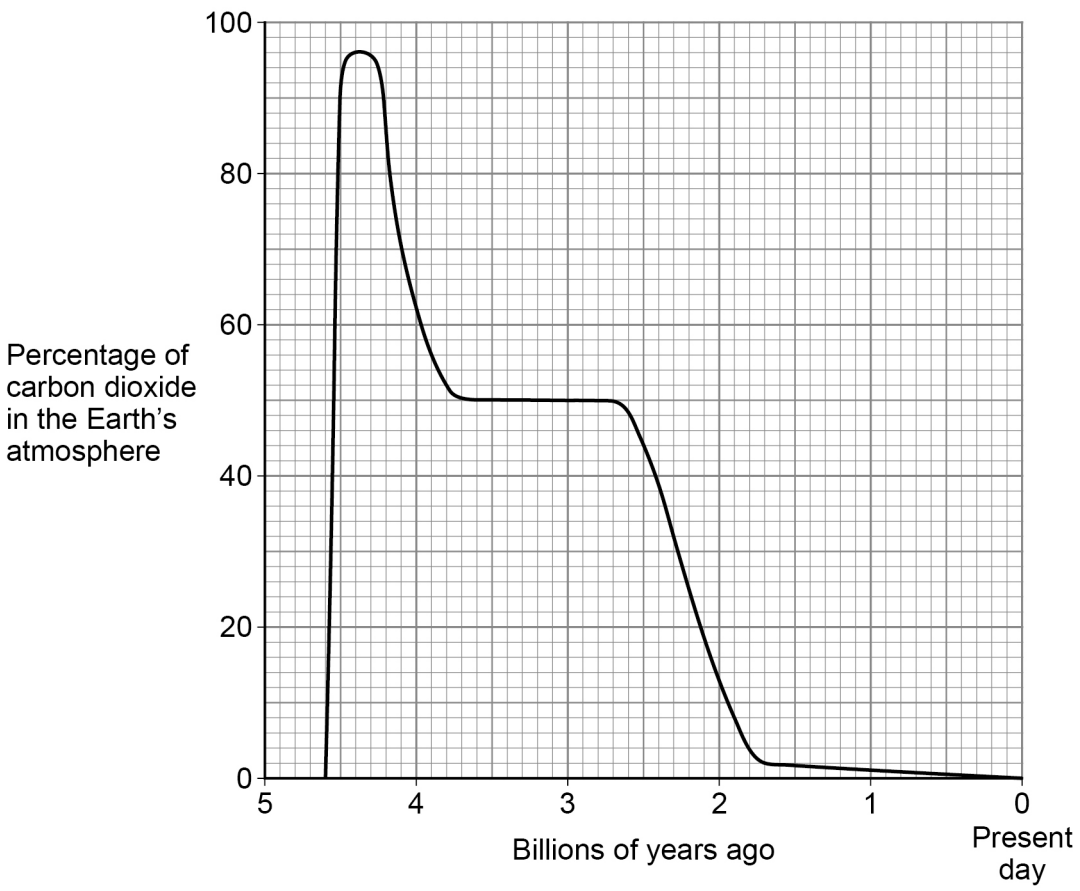
Question 6 continues on the next page

5.9.1.2 The Earth's early 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

5.9.1.2 The Earth's early 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

5.9.1.2 The Earth's early atmosphere

Question 03

June 2022 | 8464/C/2H | Original Q5

0 5 This question is about the Earth's atmosphere and the Earth's resources.

0 5 . 1 After the formation of the Earth's early atmosphere, the amounts of nitrogen and oxygen in the atmosphere changed.

Explain the main changes in the amounts of nitrogen and oxygen in the Earth's atmosphere.

[4 marks]

Nitrogen _____

Oxygen _____

0 5 . 2 Describe how coal was formed from the carbon dioxide present in the Earth's early atmosphere.

[4 marks]

0 5 . 3 The combustion of 1.0 kg of coal produces more carbon dioxide than the combustion of 1.0 kg of natural gas.

Suggest why.

[1 mark]

5.9.1.2 The Earth's early atmosphere

Question 03 · continued

Metals are extracted from metal ores found in the Earth.

0 5 . 4 Describe how bioleaching is used to extract copper from low grade ores.

[3 marks]

0 5 . 5 Phytomining uses plants to extract nickel from low grade ores.

The plants contain 0.792% nickel by mass.

The plants are burned to produce ash.

The ash from these plants contains 4.80% nickel by mass.

Calculate the mass of ash produced from burning 1000 kg of plants.

Give your answer in grams in standard form.

[4 marks]

Mass of ash (in standard form) = _____ g

16

5.9.1.2 The Earth's early atmosphere

Question 04

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

5.9.1.2 The Earth's early atmosphere

Question 04 · 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

5.9.1.2 The Earth's early atmosphere

Question 04 · 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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