

AQA – Chemistry of the atmosphere – GCSE Chemistry Paper 2

1. June/2021/Paper_2F/No.3

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An increase in greenhouse gases in the Earth's atmosphere causes an increase in global temperature.

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An increase in global temperature is a major cause of climate change.

Give two effects of global climate change.

[2 marks]

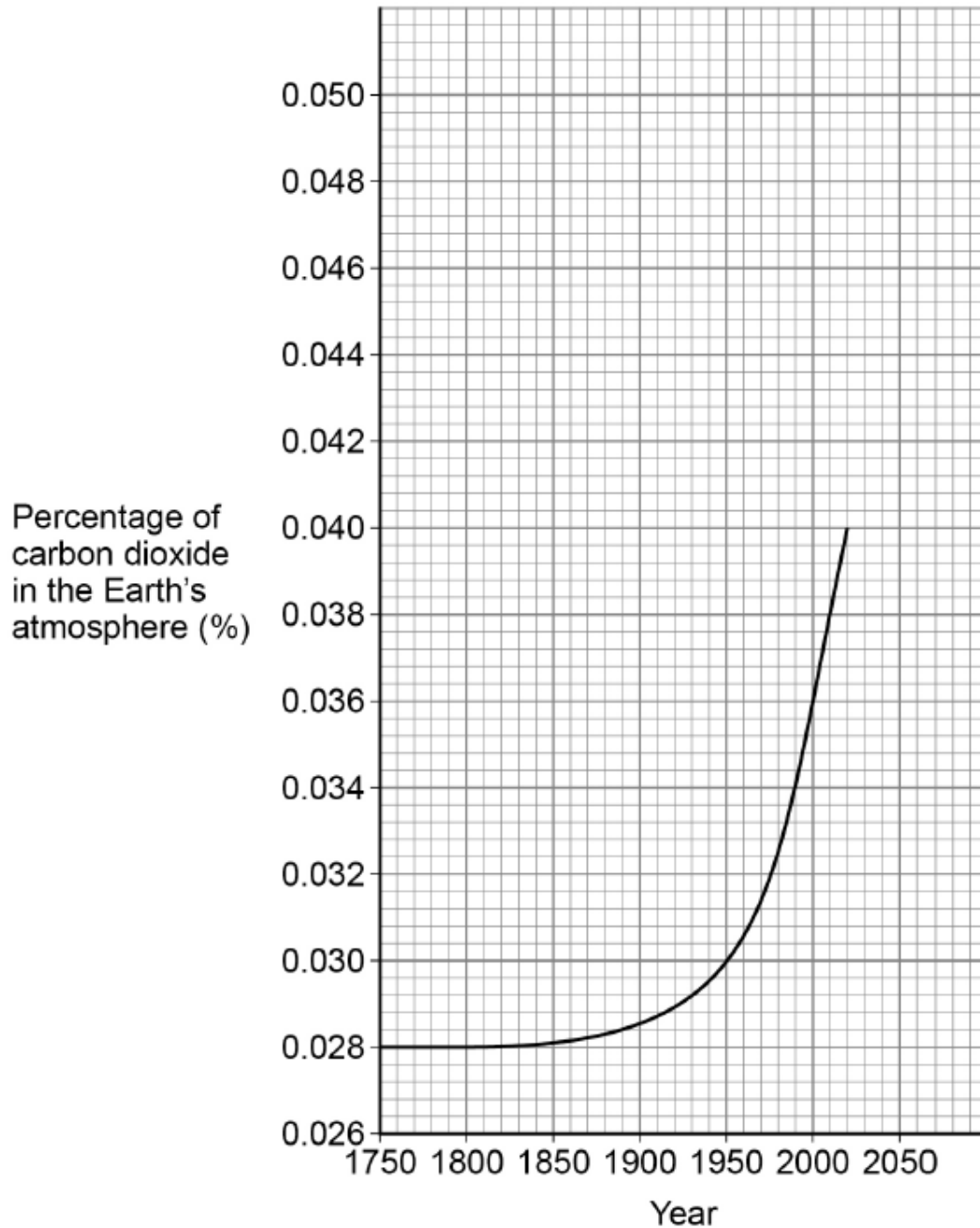
1 _____

2 _____

Carbon dioxide is a greenhouse gas.

Figure 3 shows the percentage of carbon dioxide in the Earth's atmosphere from 1750.

Figure 3



- 0 3 . 2 Describe the trend in the percentage of carbon dioxide in the Earth's atmosphere from 1750 to 2000.

Use **Figure 3**.

[2 marks]

- 0 3 . 3 Determine the change in the percentage of carbon dioxide in the Earth's atmosphere from 1950 to 2000.

Use **Figure 3**.

[2 marks]

Percentage of carbon dioxide in 1950 _____

Percentage of carbon dioxide in 2000 _____

Change in percentage of carbon dioxide = _____ %

- 0 3 . 4 Give **one** reason why the percentage of carbon dioxide in the atmosphere is changing.

[1 mark]

- 0 3 . 5 Predict the percentage of carbon dioxide in the Earth's atmosphere in 2050.

You should extend the graph line on **Figure 3**.

[2 marks]

Percentage of carbon dioxide in 2050 = _____ %

2. June/2021/Paper_2F/No.4

0 4

This question is about the atmospheres of Earth and Mars.

0 4 . 1

Earth's early atmosphere may have been like the atmosphere of Mars today.

Why are scientists **not** certain about the percentage of gases in the Earth's early atmosphere?

[1 mark]

0 4 . 2

What was formed from the water vapour in the Earth's early atmosphere?

[1 mark]Tick (✓) **one** box.

Crude oil

Limestone

Natural gas

Oceans

0 4 . 3 The Earth's atmosphere today consists mainly of nitrogen and oxygen.

Draw **one** line from each gas to what produced the gas.

[2 marks]

Gas	What produced the gas
Nitrogen	Algae
Oxygen	Animals
	Fossils
	Oceans
	Volcanoes

Table 2 shows the percentage of some gases in the atmospheres of Earth and Mars.

Table 2

Gas	Percentage of gas in atmosphere (%)	
	Earth	Mars
Argon	0.9	1.9
Carbon dioxide	0.04	95
Nitrogen	78	2.6
Oxygen	21	0.2

0 4 . 4 Why are animals not able to live on Mars?

[1 mark]

Tick (✓) **one** box.

The atmosphere of Mars does not contain enough argon.

The atmosphere of Mars does not contain enough nitrogen.

The atmosphere of Mars does not contain enough oxygen.

0 4 . 5 There is more carbon dioxide on Mars than on Earth.

Which **other** gas is found in larger quantities on Mars than on Earth?

[1 mark]

04.6

Calculate how many times more nitrogen than oxygen there is in the atmosphere of Earth.

Use Table 2.

Give your answer to 2 significant figures.

[3 marks]

Number of times more nitrogen than oxygen (2 significant figures) = _____

3. June/2021/Paper_2H/No.5

0 5

Atmospheric pollution is emitted by cars.

Some car emissions contain nitrogen dioxide.

0 5 . 1

Describe how nitrogen dioxide (NO_2) is produced in the engine of a car that burns fossil fuels.**[3 marks]**

Table 3 shows the concentration of nitrogen dioxide in the air in three different areas for 1 week.

Table 3

Day	Concentration of nitrogen dioxide in the air in micrograms per m ³		
	City centre	Countryside	Motorway
Monday	35	8	22
Tuesday	37	8	23
Wednesday	37	8	23
Thursday	34	8	23
Friday	37	8	23
Saturday	29	7	20
Sunday	X	6	17

- 0 5 . 2 The mean value for nitrogen dioxide in the air for the whole week in the city centre is 33 micrograms per m³.

Calculate the value (X) for the concentration of nitrogen dioxide in the air in the city centre on Sunday.

[2 marks]

X = _____ micrograms per m³

- 0 5 . 3 Each value in **Table 3** has an uncertainty of ± 2 micrograms per m³.

Explain why this uncertainty is **most** significant for countryside data.

[2 marks]

Nitrogen dioxide is removed from car emissions by catalytic converters.

0 5 . 4

In a catalytic converter nitrogen dioxide (NO_2) reacts to produce nitrogen and oxygen.

Complete the equation for the reaction.

You should balance the equation.

[2 marks]



0 5 . 5

The catalyst in a catalytic converter contains platinum.

Platinum is a finite resource.

What is meant by a 'finite resource'?

[1 mark]

0 5 . 6

Emissions from cars contain carbon dioxide.

Explain why carbon dioxide emissions during use and operation are **not** the total carbon footprint for a car.

Refer to the stages of the life cycle assessment of a car in your answer.

[3 marks]
