The composition and evolution of the Earth's atmosphere

1 **a** **Match the gas to its percentage composition of the atmosphere today.** (2 marks, ★)

Nitrogen	0.9%
Oxygen	<0.1%
Argon	78%
Water, carbon dioxide and other gases	21%

b **Which is the most abundant gas in the atmosphere?** (1 mark, ★)

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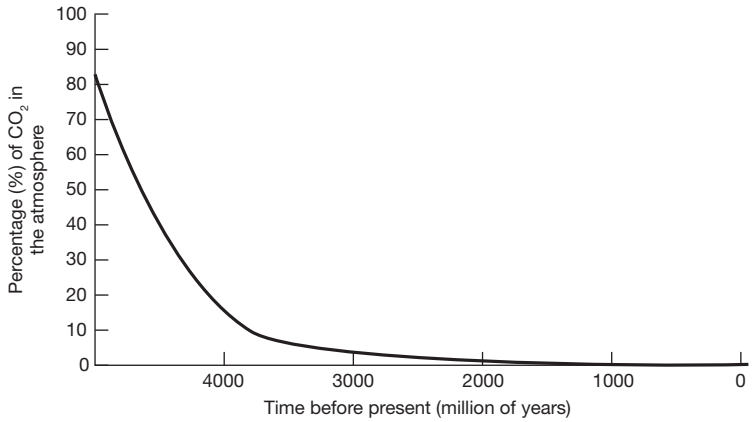
2 **The graph shows how the percentage of CO_2 in the atmosphere has changed. Use the data in the graph to answer the questions.**



a **Describe how the amount of carbon dioxide in the atmosphere has changed over the last 4 billion years.** (2 marks, ★★)

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b **Explain two of the processes that caused this change. Include equations for any chemical reactions in your answer.** (4 marks, ★★★)

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Global warming

1 **Fill the gaps in this sentence to explain the greenhouse effect.** (3 marks, ★★)

Short wavelength	**long wavelength**	**infrared radiation**	**absorbed**
emit	**temperatures**	**greenhouse gases**	

..... UV rays from the sun pass through the atmosphere. Some of this energy is reflected back by Earth as UV rays, but some is reflected back as ...... Some of this is ..... by ....., which ..... this energy in all directions, but most of it is goes back to the Earth, keeping ..... on Earth high enough to support life.

2 **Climate change regularly appears in the news in many countries throughout the world. Some scientists describe it as the biggest threat people face globally.**

a **Give four potential effects of climate change.** (4 marks, ★)

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b **Explain why climate change is often described as a global problem.** (2 marks, ★★★)

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c **Suggest why some countries may be slow to reduce the amount of carbon dioxide released into the atmosphere.** (3 marks, ★★★★)

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NAILIT!

Remember that the natural greenhouse effect is important – without it, there wouldn't be life on Earth as it would be far too cold. Global warming is a problem because human activity has released additional greenhouse gases such as methane and carbon dioxide into the atmosphere.

The carbon footprint and its reduction

1 **Tick the correct definition of the term 'carbon footprint'.** (1 mark, ★)

Carbon footprint is the amount of carbon dioxide and other greenhouse gases emitted over the lifetime of a product, service or event	
Carbon footprint is the amount of carbon dioxide and other greenhouse gases emitted during the creation of a product, service or event	
Carbon footprint is the amount of carbon dioxide and other greenhouse gases emitted by different modes of transport	
Carbon footprint is the amount of carbon dioxide and other greenhouse gases emitted during the disposal of a product	

2 **An advert by a company that installs home insulation and solar panels has the following information in their advert:**

> **Reduce the carbon footprint of your home with our zero-carbon technologies. All of our solutions have a carbon footprint of zero, such as our plant-based cavity-wall insulation.**
>
> **Cavity-wall insulation can reduce your annual carbon dioxide emissions by 1200 kg and loft insulation by 900 kg. The average UK household uses 4600 kWh of electricity per year, emitting 2601 kg of carbon dioxide – our solar panels can reduce that by 50%!**

a **Suggest which of the three solutions provided by the company will reduce carbon dioxide emissions most.** (1 mark, ★)

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b **Explain why their claim that all of their solutions have a carbon footprint of zero is likely to be misleading.** (3 marks, ★★★)

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H **c** **Calculate the reduction in the number of moles of carbon dioxide emitted by a home which has installed all of the solutions offered by the company.** (2 marks, ★★★)

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d **Explain why the reduction in carbon dioxide emissions would be less for a terraced home.** (2 marks, ★★★★)

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