| Question | Answer | Extra information | Marks | AO / Spec ref. |
| --- | --- | --- | --- | --- |
| **01** | limestonecoalplankton |  | 111 | AO1C9.1.4 |
| **02.1** | changes in rainfall patternsmore extreme storms | Deduct mark for more than two boxes ticked | 11 | AO2C9.2.3 |
| **02.2** | Fewer cows producing methane/ less deforestation.Carbon neutral so does not add to CO2.Less energy used/less fossil fuel burned in power stations/in homes so less CO2 released. | In this order. | 111 | AO3C9.2.3 |
| **03** | carbon monoxide — less oxygen carried by red blood cellscarbon particles — sunlight reflected back into spacenitrogen oxides — damage to limestone buildings |  | 111 | AO2C9.3.2 |
| **04.1** | methane and carbon dioxide | No mark if more than one box ticked . | 1 | AO1C9.2.2 |
| **04.2** | peer-reviewed evidence | No marks if more than one box ticked . | 1 | AO1C9.2.2 |
| **04.3** | the global climate system is very complex | No marks if more than one box ticked . | 1 | AO1C9.2.2 |
| **05.1** | **Level 3 (5–6 marks):** Reasonably detailed description of at least **two** changes. | 6 | AO1×2AO2×2AO3×2C9.1.2C9.1.3C9.1.4 |
| **Level 2 (3–4 marks):** Reasonably detailed description of **one** change. |
| **Level 1 (1–2 marks):** Basic description of **one** change. |
| **Level 0 (0 marks):** No relevant content. |
| **Indicative content:*** oxygen increased because plants/algae developed and used carbon dioxide for photosynthesis/growth producing oxygen
* carbon dioxide decreased because plants/algae developed and used carbon dioxide for photosynthesis/growth producing oxygen
* carbon dioxide decreased because oceans formed and dissolved/absorbed carbon dioxide
* carbon dioxide became locked up in sedimentary/carbonate rocks and/or fossil fuels
* volcanoes also produced nitrogen which gradually built up in the atmosphere
* ammonia reacted with oxygen to form nitrogen.

This indicative content is not exhaustive, other creditworthy responses should be awarded marks as appropriate. |
| **05.2** | carbon dioxidenitrogenoxygen | In this order. | 111 | AO1C9.1.1 |
| **05.3** | sulfur dioxide | Allow nitrogen oxides. | 1 | AO2C9.3.2 |
| **05.4** | Any **two** from:* idea of the removal of sulfur dioxide gas
* idea of removing sulfur from fuels
* using fuels with no sulfur content.
 |  | 11 | AO2C9.3.2 |
| **05.5** | Idea of reduced photosynthesis of damaged plants;so less carbon dioxide removed from the atmosphere. |  | 11 | AO2C9.1.4C9.2.2 |
| **05.6** | carbon monoxideunburnt hydrocarbons/solid particles/carbon |  | 11 | AO1C9.3.2 |