

## Chemistry of the atmosphere

| Content  | End |
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| Outline the proportions of the main gases in the atmosphere, as they have been for 200 million years.  |     |
| Explain why evidence for the early atmosphere is limited.  |     |
| Describe the composition of the early Earth's atmosphere and name the planets it may have been similar to.   |     |
| Outline one theory for the formation of the atmosphere, including the gases thought to be found in the early atmosphere and those that gradually built up, and how the oceans were formed. |     |
| Describe how oceans reduced the amount of carbon dioxide in the atmosphere.  |     |
| Interpret evidence and evaluate theories about the Earth's early atmosphere.   |     |
| Name organisms that produced the oxygen in the atmosphere and the reaction within these organisms that produced it (photosynthesis).   |     |
| State the word and symbol for this reaction (photosynthesis).  |     |
| State when algae first produced oxygen that appeared in the atmosphere.  |     |
| Explain how algae, followed by the evolution of plants, were important for the evolution of other organisms.   |     |
| Describe how algae and plants decreased the percentage of carbon dioxide in the atmosphere.  |     |
| Describe other process that have decreased the percentage of carbon dioxide in the atmosphere.   |     |
| Describe the main changes in the atmosphere over time and some likely causes of these changes.   |     |
| Describe and explain the formation of deposits of limestone, coal, crude oil and natural gas.  |     |
| Name the three main greenhouse gases and explain why they are important for life.  |     |
| Describe the greenhouse effect in terms of the interaction of short and long wavelength radiation with matter.   |     |
| Describe two human activities which have increased the amount of carbon dioxide, and two which have increased the amount of methane in the atmosphere.                                     |     |
| Explain what is meant by peer reviewed evidence, and why many scientists believe that human activities is causing global warming and global climate change.                                |     |

| Content  | End |
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| Explain why it is difficult to model climate change and the consequences of this on how it is presented in the media.          |     |
| Evaluate the quality of evidence in a report about global climate change   |     |
| Describe uncertainties in the evidence base.   |     |
| Explain the importance of peer review of results and of communicating results to a wide range of audiences.                    |     |
| State the major cause, and describe four potential effects of global climate change  |     |
| Discuss the scale, risk and environmental implications of global climate change.   |     |
| State what a carbon footprint is.  |     |
| Describe actions to reduce emissions of carbon dioxide and methane.  |     |
| Give reasons why actions to reduce emissions may be limited.   |     |
| State the major sources of atmospheric pollutants.   |     |
| State the elements which fuels may contain.  |     |
| State what gases may be released into the atmosphere by combustion of a fuel.  |     |
| Describe how these are produced by combustion of fuels.  |     |
| Predict the products of combustion given information about the composition of the fuel and the conditions in which it is used. |     |
| Name pollutants produced by combustion of fuels.   |     |
| Describe and explain the problems caused by increased amounts of these pollutants in the air.                                  |     |