

Geography – Physical geography: Carbon Cycle

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| **Specification content** | **Possible exam and revision questions** |
| **The Carbon Cycle**   * Global distribution and size of major stores of carbon – lithosphere, hydrosphere, cryosphere biosphere, atmosphere. * Factors driving change in the magnitude of these stores over time and space, including flows and transfers at plant, sere and continental scales. Photosynthesis, respiration, decomposition, combustion, burial, compaction, carbon sequestration in oceans and sediments, weathering. * Changes in the carbon cycle over time, to include natural variation (including wild fires, volcanic activity) and human impact (including hydrocarbon fuel extraction and burning, farming practices, deforestation, land use changes). * The carbon budget and the impact of the carbon cycle upon land, ocean and atmosphere, including global climate. | ***Outline the process of photosynthesis in the carbon cycle. [3 marks] AQA 2017 AS Paper***  ***How far do you agree that changes to the carbon cycle will lead to increasingly severe storm events? [9 marks] AQA 2017 AS Paper***  ***Assess the extent to which rising global temperatures may result in a positive feedback cycle of yet more higher carbon content in the atmosphere (20 marks) Cambridge textbook.***  Explain the concept of dynamic equilibrium in relation to the carbon cycle at the scale of the lithosphere. (4 marks) Oxford  Describe the key stores within the carbon cycle and the transfers between them as a local scale (4 marks) Oxford  Outline the processes by which natural variation in the carbon cycle occurs. (6 marks) Oxford  Evaluate the view that changes in the global carbon cycle are a threat to Antarctica. (9 marks) Hodder |
| **Water, Carbon, Climate and Life on Earth**   * The key role of the carbon and water stores and cycles in supporting life on Earth and particular reference to climate. The relationship between the water cycle and carbon cycle in the atmosphere. The role of feedbacks within and between cycles and their link to climate change and implications for life on Earth. * Human interventions in the carbon cycle designed to influence carbon transfers and mitigate the impacts of climate change. | ***Assess the extent to which there are inter-relationships between processes in the water cycle and factors driving change in the carbon cycle. [20 marks] AQA Specimen Assessment Material - A level***  Is carbon sequestration a recent human innovation or a natural process? (6 marks)  Evaluate the relative importance of natural and human factors in driving change in the carbon cycle over time. (20 marks) Oxford |
| **Case Study 1**  Case study of a tropical rainforest setting to illustrate and analyze key themes in water and carbon cycles and their relationship to environmental change and human activity.  **Case Study 2**  Case study of a river catchment(s) at a local scale to illustrate and analyze the key themes above, engage with field data and consider the impact of precipitation upon drainage basin stores and transfers and implications for sustainable water supply and/or flooding. | ***To what extent do you agree that human activity is responsible for permanent changes to the carbon cycle in tropical rainforests? [20 marks] AQA Specimen Assessment Material – AS level***  ***With reference to a river catchment that you have studied, assess the potential impact of human activity upon the drainage basin. [20 marks] AQA 2017 AS Paper***  With reference to an area of rainforest you have studied, assess the extent to which the water and carbon cycles in that area may be related to attempts at global governance. (20 marks) Hodder  With reference to a river catchment you have studied, to what extent do different land surfaces within the drainage basin affect both the infiltration rates and the channel flows? (20 marks) Hodder |