

Topic

Topic: Water ar

The Water Cycle

The Carbon Cycle

**Water, Carbon,
Climate and life on
Earth**

Case Studies

Specification

Land Carbon Cycles

Describe and explain the inputs – outputs.

Describe and explain energy, stores/components.

Describe and explain flows/transfers.

Describe and explain positive/negative feedback.

Describe and explain dynamic equilibrium.

Describe the global distribution and size of major stores of water – lithosphere, hydrosphere, cryosphere and atmosphere.

Describe and explain the processes driving change in the magnitude of these stores over time and in space, including flows and transfers: evaporation, condensation, cloud formation, causes of precipitation and cryospheric processes, at hill slope, drainage basin and global scales with reference to varying timescales involved.

Describe and explain drainage basins as open systems – inputs and outputs, to include precipitation, evapotranspiration and runoff; stores and flows, to include: Interception, surface, soil water, groundwater and channel storage; stemflow, infiltration overland flow and channel flow.

Explain the concept of water balance.

Describe and explain the causes of runoff variation and explain how it affects the flood hydrograph.

Describe, explain and examine the changes in the water cycle over time to include natural variation including storm events, seasonal changes and human impact including farming practices, land use change and water abstraction.

Describe the global distribution, and size of major stores of carbon – lithosphere, hydrosphere, cryosphere biosphere, atmosphere.

Describe, explain and examine the factors driving change in the magnitude of these stores, over time and in space, including flows and transfers at plant, sere and continental scales. Photosynthesis, respiration, decomposition, combustion, carbon sequestration in oceans and sediments, weathering.

Describe and explain photosynthesis, respiration, decomposition, combustion, carbon sequestration in oceans and sediments, weathering.

Describe, explain and examine the 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).

Describe the carbon budget and examine and explain the impact of the carbon cycle upon land, ocean and atmosphere, including global climate

Explain the key role of the carbon and water stores and cycles in supporting life on Earth with particular reference to climate.

Assess the relationship between the water cycle and carbon cycle in the atmosphere.

Examine the role of feedbacks within and between cycles and their link to climate change and implications for life of Earth.

Examine and assess the human interventions in the carbon cycle designed to influence carbon transfers and mitigate the impacts of climate change.

Examine a case study of a tropical rainforest setting to illustrate and analyse key themes in water and carbon cycles and their relationship to environmental change and human activity.

Examine a case study of a river catchment(s) at a local scale to illustrate and analyse 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.

AQA A Level Geography

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Wider reading/watching	Wider reading/watching
<u>Water Cycle</u>	
<u>Factors</u>	
<u>Drainage Basin</u>	
<u>Water Balance</u>	
<u>Hydrograph</u>	
<u>Time for Geography</u>	<u>Carbon Cycle Article</u>
<u>Factors</u>	

<u>Time for Geography</u>	<u>Time for Geography</u>
<u>Clip</u>	
<u>Water and Carbon</u>	
<u>Changes in Carbon</u>	<u>feedbacks</u>
<u>Climate Change</u>	<u>Mitigation of Climate Change</u>
<u>Deforestation in Amazon</u>	<u>Climate Change</u>
<u>Case Study</u>	

Exam Questions

What is the difference between input and outputs

What is meant by the term 'store' in a system

What is meant by the term 'flows' in a system

Explain how 'positive feedback' can alter a natural system

What it mean when a system is said to be in 'dynamic equilibrium'

Name the 5 subsystems of the Earth

Outline the impact of long-term global temperature changes on the water cycle

Explain 3 stores in the water cycle

Outline seasonal changes in the water balance

Outline three factors that can affect the amount of runoff in a drainage basin

Assess the importance of physical factors and human activities in driving changes in the water cycle

Explain why carbon is found in the Hydrosphere

Outline the role of living organisms in the carbon cycle

What is carbon sequestration

Human activities affects the carbon cycle more than natural processes.
What is a carbon budget
How does climate change affect the water and carbon cycles
How does water and carbon link in the atmosphere
Assess the extent to which feedbacks in the carbon and water cycles may affect life on earth
How do humans affect water and carbon cycles on a regional and national scale
To what extent is human activity affecting the water cycle and the carbon cycle in tropical rainforests?
Assess the extent to which changes in the water cycle have affected flood risk in the area you have studied