PLC: Water and carbon cycles

Unit criteria	Review 1			Review 2			Review 3		
	☺	😐	☹	☺	😐	☹	☺	😐	☹
Systems in physical geography: systems concepts and their application to the water and carbon cycles inputs – outputs, energy, stores/components, flows/transfers, positive/negative feedback, dynamic equilibrium.									
Global distribution and size of major stores of water – lithosphere, hydrosphere, cryosphere and atmosphere									
Processes driving change in the magnitude of these stores over time and 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									
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. Concept of water balance									
Runoff variation and the flood hydrograph									
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									
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, 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									
The key role of the carbon and water stores and cycles in supporting life on Earth with 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									
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									
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									