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**Knowledge Rich Curriculum Plan**

SCIENCE- Water Cycle and Carbon Cycle



| **Lesson/Learning Sequence**  | **Intended Knowledge:***Students will know that…* | **Prior Knowledge:***In order to know this, students need to already know that…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment**  | **Support** |
| --- | --- | --- | --- | --- | --- | --- |
| **01****How are clouds formed?** | *Students will know that energy from the sun makes water evaporate from the land and the sea, this turns it into water vapour. Students will be able to explain that warm air rises and as it does so it carries the water vapour upwards. As the water vapour rises its temperature cools causing it to condense to form clouds.* | *Students will know that evaporation is the process where a liquid turn into a gas. Students will know that Condensing is the process where by a gas turns into a liquid.* |  | ***Evaporation:****The process by which a liquid turns into a gas****Convection:****The movement of particles through a substance, transferring energy from hotter places to colder places.****Condensation:****The process by which a gas turns into a liquid.* | Retrieval questionsSimple exam questionsHomework quiz 1 End of topic test Summative assessment 3 | Knowledge organiser (provided on Teams and in class)<https://www.bbc.co.uk/bitesize/guides/z72v4wx/revision/3>  |
| **02****Where do you find groundwater?** | *Students will be able to explain that water falls as precipitation onto land where it provides fresh water for plants and animals. Students will know that ground water is absorbed by the soil and is taken up by plant roots. Students will know that water that is not absorbed by the soil will run off into streams and rivers. Some water is returned to the ground through animal excretion and streams and rivers carry water.* | *Students will know that ground water is formed when it rains, snows or hails. Students will know that absorption of water by plants is carried out by the plant roots. Students will know that plants and animals require fresh water in order to survive.* *Students will know what run off is and how it affects us as humans.* *Students will know the difference between salt water and fresh water sources.*  |  | ***Precipitation:****The process in which rain, snow or sleet falls.****Absorption:****To take up or receive a substance****Excretion:****The process in which an organism removes waste material****Circulate:****To move around in a circle****Competition:****The interaction of individuals that both want the same, limited resource.* | *Retrieval questions**Simple exam questions**Homework quiz 1* *End of topic test* *Summative assessment 3* | Knowledge organiser (provided on Teams and in class)[*https://www.bbc.co.uk/bitesize/guides/z72v4wx/revision/3*](https://www.bbc.co.uk/bitesize/guides/z72v4wx/revision/3) |
| **03****Water cycle** | *Students will be able to explain that the water cycle is a continuous process of evaporation, condensation, precipitation and transpiration with no beginning or end. Students will know that transpiration is the loss of water from a plant in the form of water vapour. Students will be able to draw and annotate a water cycle diagram, and answer diagnostic questions including how water moves from the land into the air (evaporation and transpiration), how the water cycle helps plants and animals (by providing them with fresh water).* | *Students will know that heat energy from the sun causes water to evaporate. Plants and animals need clean fresh water to survive. That water is needed for respiration and photosynthesis.*  | *Communicate: Students will be able to construct explanations about the water cycle* | ***Transpiration:****The loss of a plant’s water to the air through evaporation****Condensation:****The process of changing from a gas to a liquid****Evaporation:****The process of changing from a liquid to a gas****Annotate:****A note added as an explanation or a commentary* | *Retrieval questions**Simple exam questions**Homework quiz 1* *End of topic test* *Summative assessment 3* | Knowledge organiser (provided on Teams and in class)[*https://www.bbc.co.uk/bitesize/guides/z72v4wx/revision/3*](https://www.bbc.co.uk/bitesize/guides/z72v4wx/revision/3) |
| **04****The Carbon Cycle.**  | *Students will be able to explain that carbon is essential for life and that living things need carbon to make most of the molecules in our body (fats, carbohydrates, nucleic acids (DNA) and proteins).**They will know that 0.04% of Earths atmosphere is composed of carbon dioxide Producers use carbon dioxide from the atmosphere to make their own food via the process of photosynthesis. Animals consume producers, the carbon is transferred from the plants to the animals in the form of glucose. The animals use this glucose to perform respiration so that energy can be released for movement and so that essential molecules can be built. Carbon is released back into the air via respiration in both animals and plants.* *When organisms die their bodies will become part of the Earth therefore, bacteria and fungi are decomposers breaking down dead organisms and releasing carbon dioxide into the atmosphere via respiration. Layers of sediment may fall on dead organisms and due to pressure, these organisms may fossilise forming fossil fuels where carbon is locked up. When Fossil fuels react with oxygen during the process of combustion, then carbon dioxide is formed and released back into the atmosphere. The cycle then starts all over again.*  | *They will know that carbon dioxide is a reactant in the process of photosynthesis.* *Plants are producers as they produce their own food via photosynthesis**Glucose is a reactant of respiration.* *Carbon dioxide is a product of respiration.*  | *Communicate: Students will be able to construct explanations about the carbon cycle* | ***Decay/Decompose:****When dead organisms break down, rotting****Respiration:****The release of energy in mitochondria, using oxygen and glucose****Abundant:****Commonly found**The Carbon cycle comprehension task.*  | *Retrieval questions**Simple exam questions**Homework quiz 1* *End of topic test* *Summative assessment 3* | Knowledge organiser (provided on Teams and in class)[*https://www.bbc.co.uk/bitesize/guides/z72v4wx/revision/3*](https://www.bbc.co.uk/bitesize/guides/z72v4wx/revision/3) |