Lesson 5: The Flow of Matter through Ecosystems

Water, Carbon, Oxygen and Nitrogen

* Living things need water, oxygen, carbon, and nitrogen to survive.
* These materials flow (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) through an ecosystem.

The Water Cycle - Plants

* Water cycles between organisms and the environment.
* Plants take water from the soil through their roots. Most of the water is needed for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (making food).
* Plants return water to the environment by transpiration. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the release of water to the air through a plant’s leaves.

The Water Cycle - Animals

* Animals take in water from the environment by drinking.
* Animals release water to the air when they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* They also return water to the environment by perspiring and by urinating.

The Carbon Cycle

* During photosynthesis, plants take carbon in the form of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from the air and it becomes part of their food (glucose).
* Animals take in carbon by eating plants or other animals, which they then digest. This carbon is released during \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and exhaled is by animals. Cellular respiration is the process where energy is released from food.
* There is also carbon in an animal’s waste. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ use these wastes for food and go through cellular respiration, releasing the carbon into the air in the form of carbon dioxide.
* When animals die, their bodies may be eaten by vultures or other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. or digested by decomposers. Both scavengers and decomposers go through cellular respiration, giving off more carbon dioxide.
* In certain conditions, both animal and plant remains may become fossilised and eventually form \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (coal, oil and gas) which contain carbon. Both fossil fuels and plant material (wood) may later be burned - releasing still more carbon dioxide to the environment.



Nitrogen

* **Although we are surrounded by nitrogen gas and organisms need nitrogen to live, most organisms cannot use the nitrogen gas around them.**
* **Nitrogen must be combined with other elements, such as hydrogen, in order to be used by organisms.**
* **This process is called nitrogen \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

Nitrogen Fixation

* **A special type of bacteria that grows on the** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **of certain plants can perform nitrogen fixation.**
* **A** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**can split the two nitrogen atoms of a nitrogen molecule, allowing the "free" nitrogen atoms to combine with oxygen and hydrogen atoms.**



The Nitrogen Cycle

Nitrogen cycles through an environment. The following diagrams show how nitrogen moves from one place to another in the environment.





