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Science Notes
Chapter 7 – Ecosystems

Lesson 3 – *How do materials cycle through ecosystems?*

I. Recycling Matter

a. Like the school, nature has its own recycling system.
b. Many of Earth's resources pass through ecosystems in a continuous cycle.
c. Important materials that Earth recycles are: nitrogen, water, carbon, and oxygen.
d. The three important cycles in nature are the nitrogen cycle, the carbon cycle, and the water cycle.

II. Nitrogen Cycle

a. Nitrogen is one of the most important resources for all living things.
b. Nitrogen is a common element in Earth's air, which is about 78 percent nitrogen.
c. "free nitrogen" is nitrogen that is not combined with other elements. Most organisms need nitrogen that is "fixed" or combined with other elements.

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d. Most free nitrogen is fixed by bacteria that live in the soil. The bacteria live in bumps on plant roots. Plants absorb fixed nitrogen from the bacteria.
e. Animals get nitrogen by eating plants or by eating prey that have eaten plants.
f. In the nitrogen cycle, nitrogen moves like this:
    i. Soil bacteria change nitrogen to gas, releasing nitrogen into the air.
    ii. Lightening and bacteria in roots fix nitrogen.
    iii. Plant roots absorb nitrogen, beginning the cycle again.

OR

    iv. Animals get nitrogen from plants.
    v. Animals die.
    vi. Decomposers release nitrogen.
    vii. Plant roots absorb nitrogen, beginning the cycle again.

III. Carbon Cycle

a. The most common element in all living this is carbon.

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b. Carbon is cycled during photosynthesis and cellular respiration.
c. Carbon is recycled many ways:
    i. Fungi and bacteria break down dead organisms releasing carbon into the soil to be used again.
    ii. Trough compressed organisms as fossil fuel.
    iii. When volcanoes erupt, carbon is released into the air as carbon dioxide.
    iv. Photosynthesis processes carbon dioxide into oxygen that animals breathe.

IV. Water Cycle

a. Water is necessary for all life.
b. The water cycle works like this:
    i. The Sun heats bodies of water, changing water to a gas (evaporation).
    ii. The gas forms water vapor and enters the air where it rises and cools.
    iii. The cooler air causes water to condense and change back into tiny drops of water.
    iv. Water returns to earths surface as rain, snow, or hail.