



High School Science Virtual Learning

Biology

April 27, 2020



High School General Biology

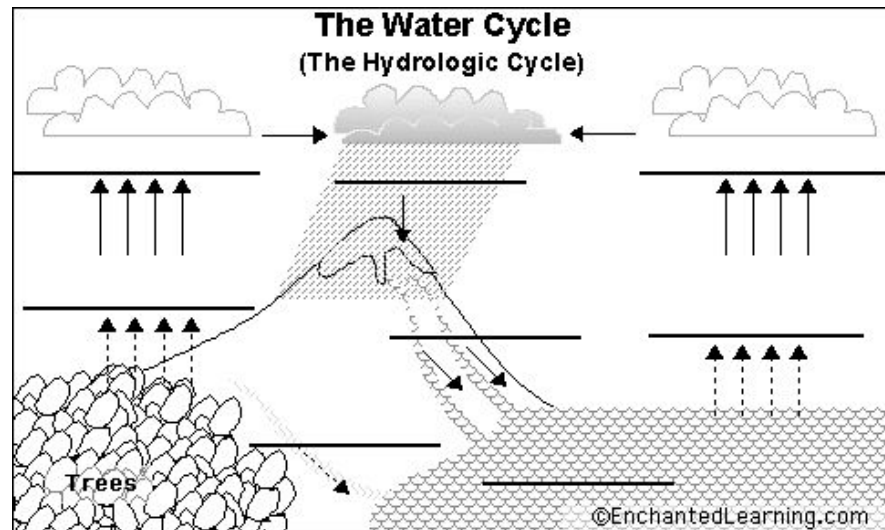
Lesson: Nutrient Cycle

Objective/Learning Target:

Students will understand how nutrient cycles work.

Bell Ringer Activity

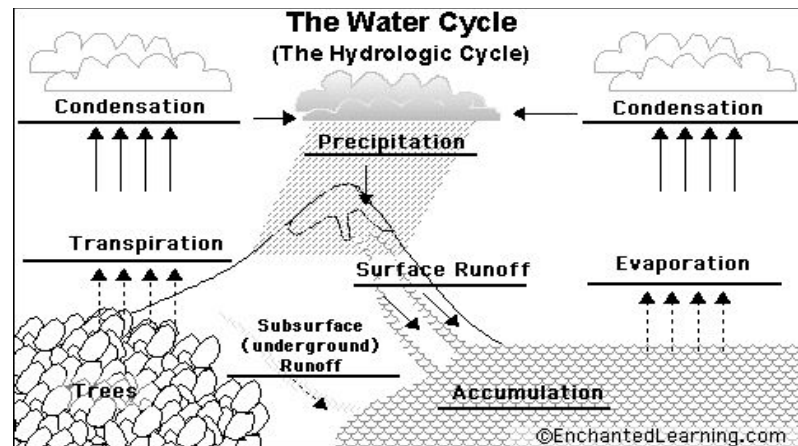
1. What is a major difference between energy and matter?
2. Label this picture with the following terms: Condensation (this one appears twice in the picture), transpiration, precipitation, surface runoff, surface underground runoff, evaporation, and accumulation.



Bell Ringer Answers

1) Since the question was bit broad there could be several different answers, but the main difference between energy and matter is that energy flows one way while matter is recycled within and between ecosystems.

2)



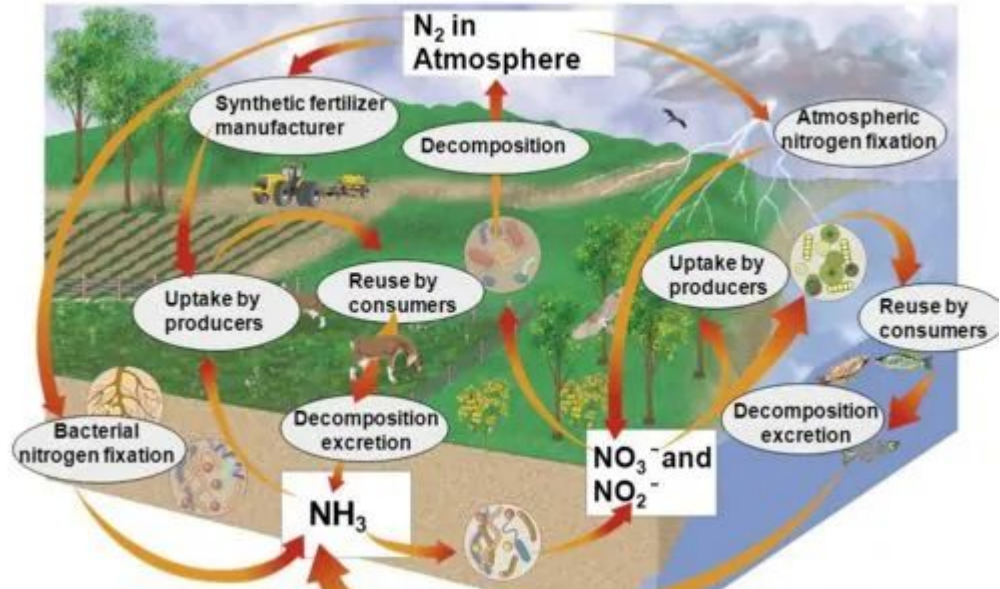
Let's Get Started!

Lesson Activity:

Directions:

1. Click on this [link](#) and on a piece of notebook paper describe each nutrient cycle.

Nutrient Cycles



The atmosphere is the main reservoir of nitrogen in the biosphere. Nitrogen also cycles through the soil and through the tissues of living organisms.

Lesson Questions Answers

Carbon Cycle-The carbon cycle is the biogeochemical cycle by which carbon is exchanged among the biosphere, pedosphere, geosphere, hydrosphere, and atmosphere of the Earth. Carbon is the main component of biological compounds as well as a major component of many minerals such as limestone.

Nitrogen Cycle- The nitrogen cycle is the biogeochemical cycle by which nitrogen is converted into multiple chemical forms as it circulates among atmosphere, terrestrial, and marine ecosystems. The conversion of nitrogen can be carried out through both biological and physical processes.

Oxygen Cycle- The oxygen cycle is the biogeochemical transitions of oxygen atoms between different oxidation states in ions, oxides, and molecules through redox reactions within and between the spheres/reservoirs of the planet Earth.

Phosphorus Cycle- The phosphorus cycle is the biogeochemical cycle that describes the movement of phosphorus through the lithosphere, hydrosphere, and biosphere

Practice Questions

1. What is the importance of the main nutrient cycles?
2. What is one of the processes that takes carbon dioxide out of the atmosphere?
3. Through which two processes does nitrogen gas get converted into usable forms for organisms?
4. How does nutrient availability relate to the primary productivity of an ecosystem?
5. What are the three pathways or cycles that move nutrients through the biosphere?

Answers to Practice Questions

1. The main nutrient cycles are important to insure every organism gets the nutrients they need to build tissues and carry out life functions.
2. Some processes that take carbon dioxide out of the atmosphere are CO₂ dissolves in rainwater, and CO₂ is taken up by producers during photosynthesis.
3. Nitrogen gas gets converted into usable forms for organisms when bacteria fix N₂ gas and when some N₂ gas is fixed by lightning.
4. If nutrient availability is limited, the primary productivity of an ecosystem will slow down or stop altogether.
5. The three pathways or cycles that move nutrients through the biosphere are the carbon cycle, the nitrogen cycle, and the phosphorus cycle.

Common Misconceptions

Not every nutrient will go through these cycles in the same path. People often think that biogeochemical cycles are linear, and that each atom or molecule goes through the cycle step-by-step. However, this is not true. The same atom or molecule may be stored for a long time in one stage of a cycle, cycled between the same two stages, or enter every stage.

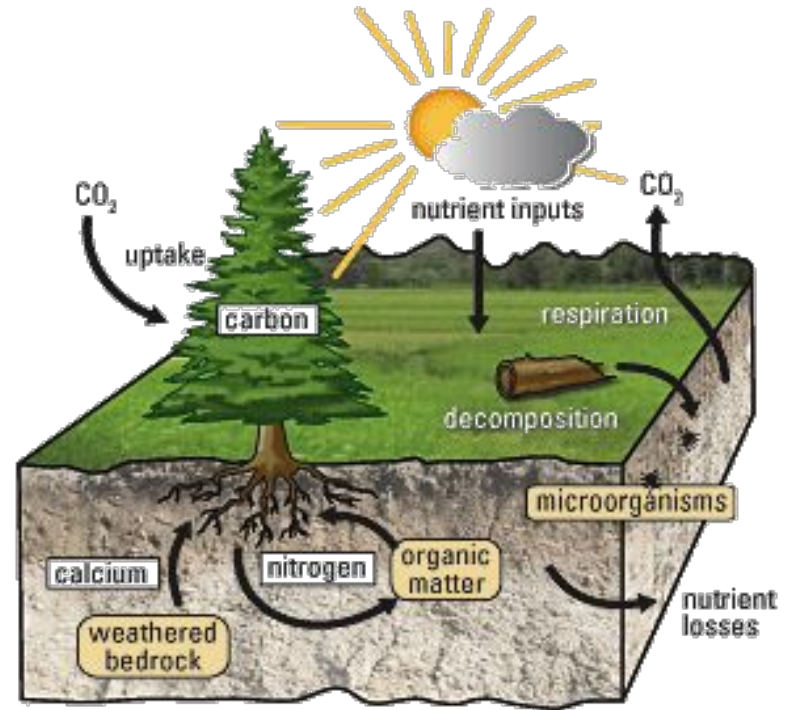
Fossil fuels are considered a nonrenewable resource. Although the process that creates fossil fuels happens naturally and continuously, fossil fuels are considered a nonrenewable resource because they are being used up much faster than they can be produced by geological processes.

More Practice

Follow the links below to do more practice.

[Biogeochemical cycles](#)

[Nutrient Cycles](#)



Additional Resources

[Siyavula - Nutrient Cycles](#)

[IPNI Canada- Generalized Nutrient Cycles](#)