What is Nutrient Cycling?

Worksheet

Nutrient cycling is the process by which matter (nutrients) moves through an ecosystem via biological, geological and chemical pathways, from the environment into organisms and back again through decomposition.

Questions

1. Which organisms are primarily responsible for breaking down dead matter in nutrient cycling?

A) Producers
B) Primary consumers
C) Decomposers
D) Predators

2. What is nitrogen fixation?

A) Plants absorbing nitrate from soil
B) Converting atmospheric N2 into usable nitrogen compounds
C) Animals eating nitrogen-rich food
D) Nitrogen evaporating into the air

3. Which nutrient cycle involves the atmosphere as a major reservoir?

A) Phosphorus cycle only
B) Carbon and nitrogen cycles
C) Only the water cycle
D) None of them

4. Why don't ecosystems run out of nutrients over time?

A) New nutrients are constantly created
B) Nutrients are recycled continuously between organisms and environment
C) Nutrients don't get used up
D) Only sunlight matters, not nutrients

5. Trace how carbon moves through a forest ecosystem.

6. Describe how nitrogen becomes available to a corn plant.

7. What happens to phosphorus in a lake ecosystem after fish die?

8. Define: What is nutrient cycling?

9. Define: Name three key nutrients that cycle through ecosystems.

10. Define: What role do decomposers play in nutrient cycling?

Answer Key

1. C) Decomposers - Decomposers like bacteria and fungi break down dead organic matter and release nutrients.

2. B) Converting atmospheric N2 into usable nitrogen compounds - Nitrogen fixation converts inert atmospheric N2 into forms like ammonium that organisms can use.

3. B) Carbon and nitrogen cycles - Both carbon (as CO2) and nitrogen (as N2) have large atmospheric reservoirs, unlike phosphorus.

4. B) Nutrients are recycled continuously between organisms and environment - Nutrient cycling recycles a fixed pool of matter, unlike energy which flows through and is lost as heat.

5. Producers: trees absorb atmospheric CO2 through photosynthesis and build organic carbon compounds Consumers: herbivores eat plant material, carbon moves up the food chain Respiration: organisms release CO2 back to the atmosphere via cellular respiration Decomposition: decomposers break down dead matter, releasing more CO2 Result: carbon completes its cycle between atmosphere, organisms and soil

6. Fixation: nitrogen-fixing bacteria (or lightning/fertilizer) convert atmospheric N2 into ammonium/nitrate Uptake: corn roots absorb nitrate from the soil Assimilation: the plant builds proteins and nucleic acids from the nitrogen Consumption: an animal or human eats the corn, passing nitrogen along Decomposition: decomposers return nitrogen compounds to the soil after death, and denitrifying bacteria return some N2 to the atmosphere

7. Producers: algae absorb dissolved phosphate from the water Consumers: small fish eat algae, larger fish eat small fish Death: when fish die, their bodies sink and decompose Decomposition: bacteria break down the tissue, releasing phosphate back into the water Result: phosphate becomes available again for algae to absorb, completing the cycle

8. The continuous movement of nutrients between living organisms and the environment through biological and chemical processes.

9. Carbon, nitrogen and phosphorus (also water, sulfur).

10. They break down dead organic matter, releasing nutrients back into the soil, water or atmosphere.