

# Biochemical cycles



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INTRODUCING WITH BIOCHEMICAL CYCLES Biochemical cycles Nutrients are important for organisms to function. Each nutrient has a role in global biogeochemical cycles. A nutrient is a chemical that organisms need to live and grow and are substances an organism's uses for metabolism which must be taken in from its environment that enrich the organism. Two types of nutrients are macronutrients and micronutrients. Macronutrients are needed in large quantities while micronutrients are needed in smaller quantities.

A biogeochemical cycle moves chemical element between living, and nonliving parts in the environment. I will describe the water cycle, explaining the major processes involved and the relationship of micronutrients. There are five major global biogeochemical cycles, each with a different function and relationship to micronutrients. They can be classified as either gaseous, sedimentary, or hydrologic. The water cycle is a hydrologic cycle that moves water in the biosphere through evaporation, condensation and precipitation.

Two sedimentary cycles are the sulfur and phosphorous cycle. Their main reservoirs are in soil and rock sediments. Sulfur enters the cycle as hydrogen sulfide and is oxidized to sulfur dioxide. Sulfur dioxide and water vapor makes sulfuric acid in the rainfall. It is then absorbed by plant roots and turned into amino acids traveling through the food chain and released by decomposition. In the phosphorous cycle, phosphorous is released through erosion or mining. It is then absorbed by roots and then travels through the food chains and returned to sediment.

When the main reservoir of the nutrient is the atmosphere it is considered a gaseous cycle. The carbon and nitrogen cycles are gaseous cycles. Carbon enters the environment during photosynthesis and is returned through

cellular respiration. Nitrogen enters the cycle by nitrogen fixation and results in ammonia and nitrates that are carried to the Earth by precipitation. Once they entered into the soil they are absorbed by plants. Micronutrients are needed in each of the biogeochemical cycles to help convert, absorb, or facilitate each cycle.

Water is essential to all organisms and has a major impact on global processes. The hydrologic cycle begins with the evaporation of water from the ocean. Evaporation is caused by solar energy. The ocean is the major reservoir in the water cycle. It contains 97% of the water in the biosphere. As moist air is lifted, it cools and water vapor forms. Moisture is then moved around the atmosphere until it returns to the Earth's surface as precipitation. Once water reaches the surface it becomes groundwater.

Groundwater either seeps back into the oceans, rivers, and streams, or absorbed by plants. The leaves and stems put water back into the atmosphere through a process called transpiration. Transpiration accounts for approximately ten percent of all evaporating water returning to the cycle. Biogeochemical cycles are pathways which macronutrients, micronutrients, or other molecules move through the biosphere, lithosphere, hydrosphere, and atmosphere. These nutrients are recycled and passed from one organism to another and from one part of the biosphere to another through biogeochemical cycles.