



Biogeochemical Cycles

Matter in Ecosystems

- **Matter moves in cycles from living organisms to the environment and back again**
- **Cycles involve biological, chemical, and geological interactions**



Carbon Cycle

Photosynthesis: plants, algae, and certain bacteria remove carbon from air

Respiration: process by which cells release energy from the chemical bonds of food molecules

Decomposition: the process by which organic substances are broken down into simpler forms of matter

Combustion: the process of burning; a series of exothermic chemical reactions between a fuel and an oxidant

* **Burning of fossil fuels**



Hydrologic cycle

Evapoation: solar energy heats liquid water, changing it into a gas. Warm moist water vapor expands and rises into atmosphere

Transpiration: the evaporation of water from plant leaves

Condensation: Water vapor changes to liquid droplets which form on small particles in the air

Precipitation: Water droplets or ice crystals in clouds get too heavy and fall to the ground



Nitrogen Cycle

Nitrogen Fixation: process carried out by certain bacteria in which nitrogen is fixed into a form that organisms can use , ammonia

Nitrification : when soil bacteria convert ammonia to nitrate

Assimilation: plants absorb ammonia or nitrate through their roots and convert it into compounds such as proteins. Animals then take in the nitrogen when they consume plants or animals

Ammonification: when organisms produce nitrogen –containing waste products such as urine

Denitrification: when nitrate is converted back to nitrogen gas by certain bacteria

Sulfur Cycle

Sedimentary rocks erode – releasing sulfur into oceans and soil – absorbed by plants – consumed by organisms – waste excreted back to soil – deposited as rock – geologic processes



Phosphorus cycle

Erosion : process by which soil and rock are removed from the Earth's surface by wind or water and deposited in other locations. Phosphorus containing minerals erode and carry phosphorus into soil

Phosphate rocks – soil – plant roots – consumed by organisms – released in waste by decomposition – enters soil – burial and compaction to form rock – geologic processes (uplift and mountain building)

