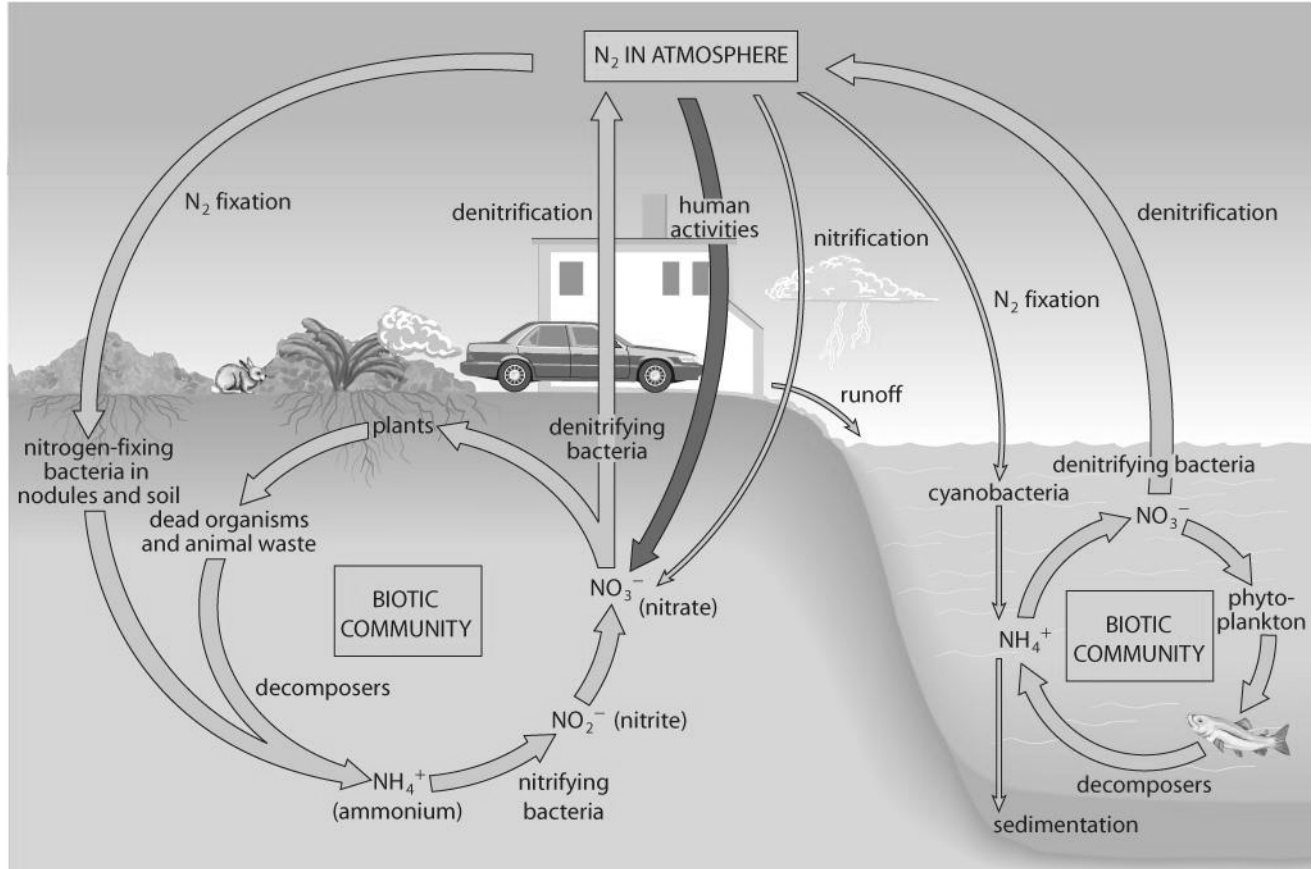


**CHAPTER 2****OVERHEAD****The Nitrogen Cycle****BLM 2.2.9**

The nitrogen cycle is a biogeochemical cycle that shows how nitrogen is converted into different forms as it is transported through the air, water, and soil. All organisms require nitrogen to make proteins and genetic material (DNA).



### Nitrogen in the Air

- Nitrogen gas ( $N_2$ ) makes up 78.1 percent of Earth's atmosphere by volume.
- Most organisms, however, cannot use atmospheric nitrogen.

### Nitrogen in the Water

- Nitrogen gas is removed from the atmosphere via nitrogen-fixing cyanobacteria, which convert it into a form plants can use—ammonium ( $NH_4^+$ ).
- Some types of aquatic bacteria then convert the ammonium into nitrate ( $NO_3^-$ ), which plants can also use.
- Other bacteria convert nitrate back into nitrogen gas via denitrification.

### Nitrogen in the Soil

- Nitrogen-fixing soil bacteria live in close association with plants. They convert nitrogen gas into ammonium. Decomposers also break down organic matter to produce ammonium.
- Soil bacteria then convert the ammonium into nitrite ( $NO_2^-$ ) and then nitrate.
- Denitrifying bacteria then convert these compounds back into nitrogen gas.