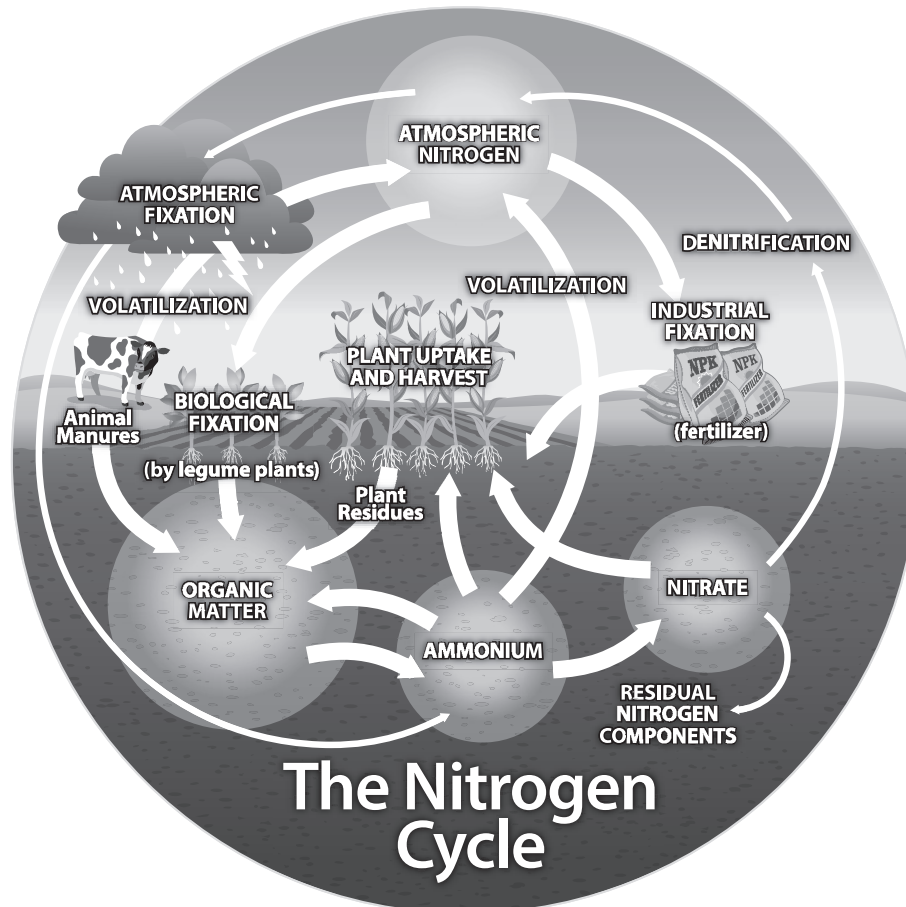


Nitrogen Cycle



- ▶ **Ammonification:** Bacteria or fungi convert organic forms of nitrogen (mostly from plant and animal waste) into ammonium NH_4^+ , which can be used by plants.
- ▶ **Assimilation:** Living organisms take up nitrogen to be used for biological processes such as making chlorophyll, proteins, and enzymes.
- ▶ **Denitrification:** Under poor aeration, soil bacteria convert nitrate ions NO_3^- into nitrogen gas N_2 , which cannot be used by plants and is lost to the atmosphere.
- ▶ **Fixation:** Bacteria convert nitrogen gas N_2 into ammonium NH_4^+ or nitrate NO_3^- that living organisms can assimilate. Rhizobium bacteria have the unique ability to fix nitrogen through metabolic processes. These bacteria form symbiotic relationships with plants in the legume family. Nitrogen gas can also be converted to forms that plants can use through the production of commercial fertilizers.
- ▶ **Nitrification:** Soil bacteria convert ammonium NH_4^+ into nitrate NO_3^- ions. Oxygen is needed for this process, therefore, nitrification takes place in the top layers of soil and flowing water. Nitrates can be used by plants.
- ▶ **Physical movement:** The physical movement of any form of nitrogen, which may include tilling (moving under the soil), leaching (moving through the soil), carrying (to transport via water), or runoff (the flow of water over land). No chemical process is involved in physical movement.