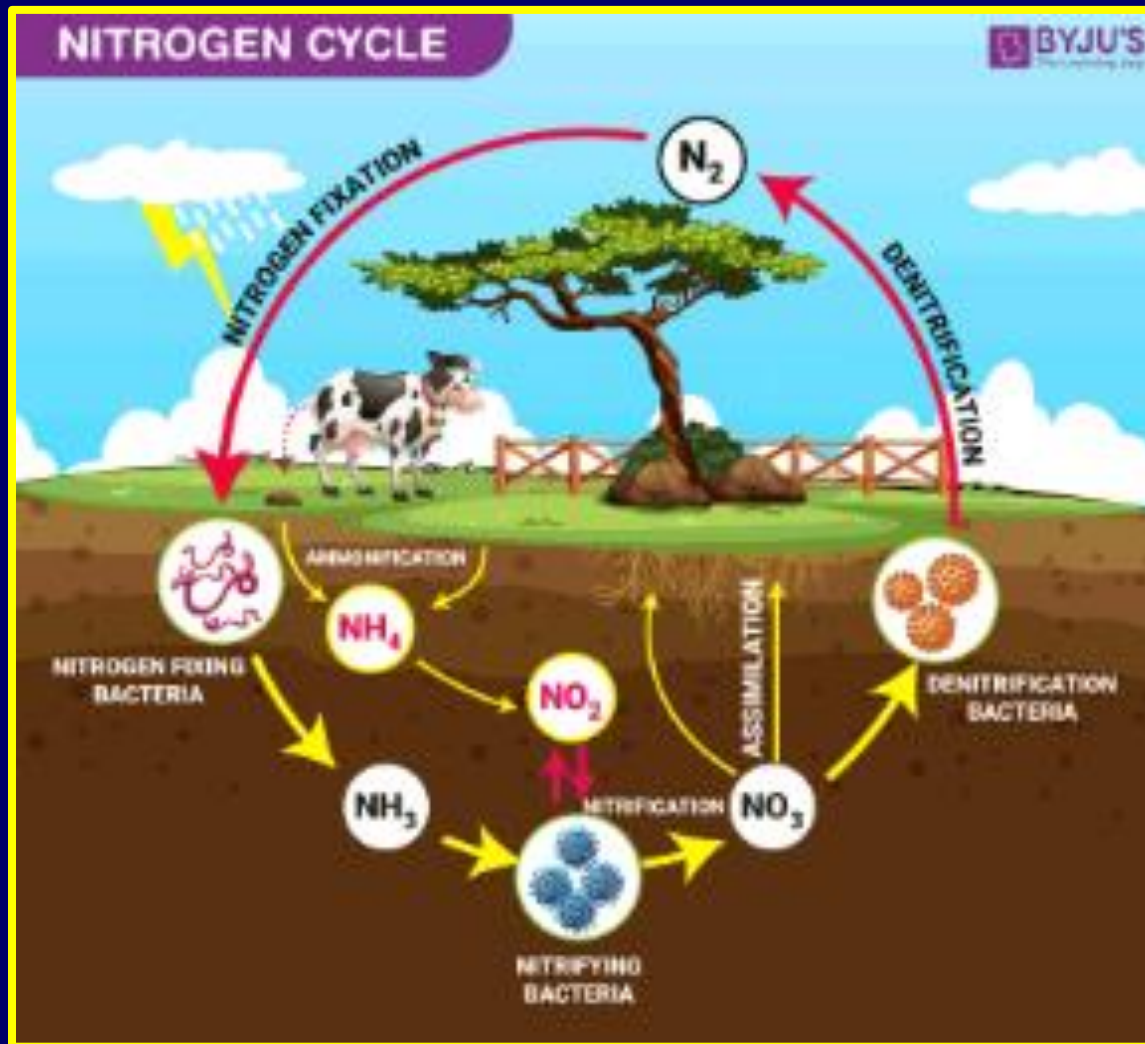


Nitrogen Cycle



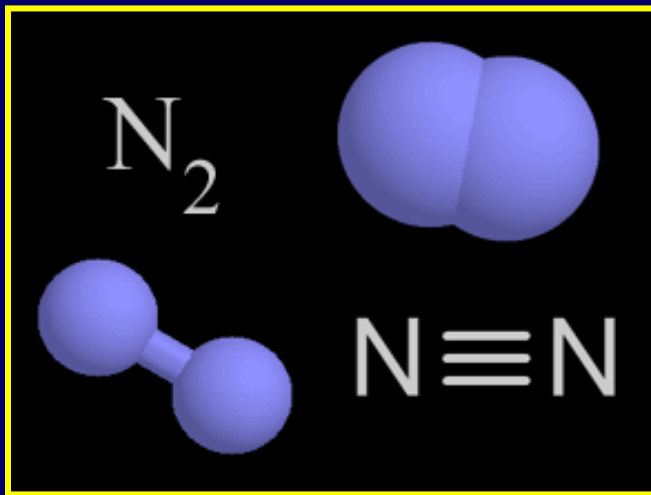
I Can Statements

At the end of this lesson, you should be able to say, with confidence:

- I can describe how water is recycled in an ecosystem.
- I can explain how nitrogen is recycled in an ecosystem.

Nitrogen Cycle

Atmospheric Nitrogen consists of two nitrogen atoms bonded together to form the nitrogen molecule, N_2 .

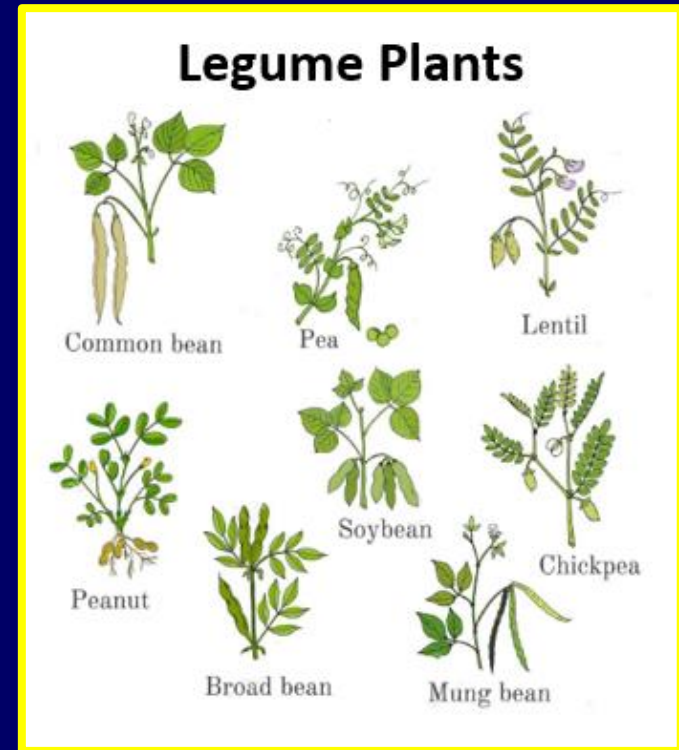
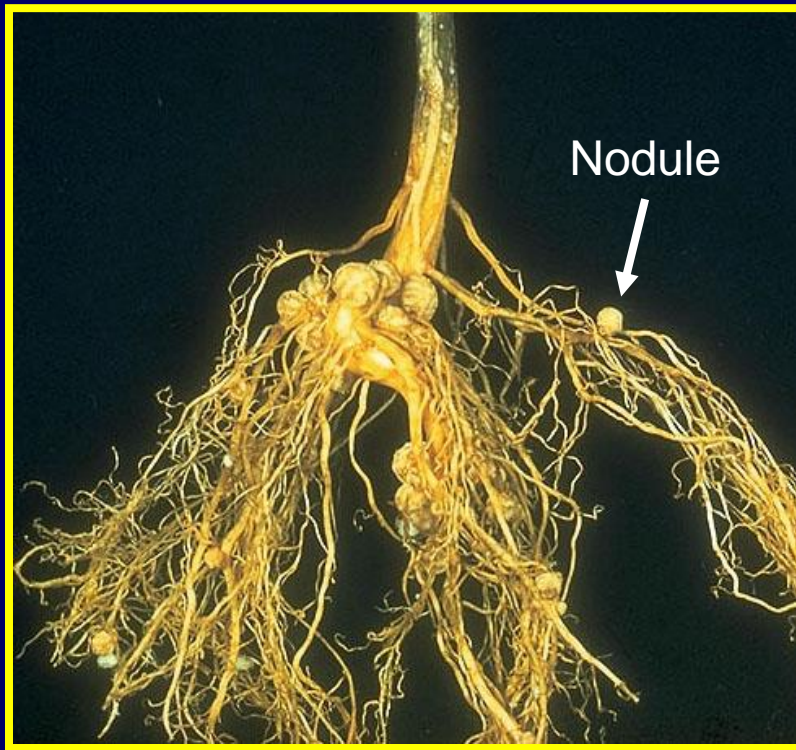


Most organisms cannot break that triple bond, in order to use the nitrogen atom.

Both plants and animals breathe in nitrogen molecules, N_2 , and breathe them right back out again.

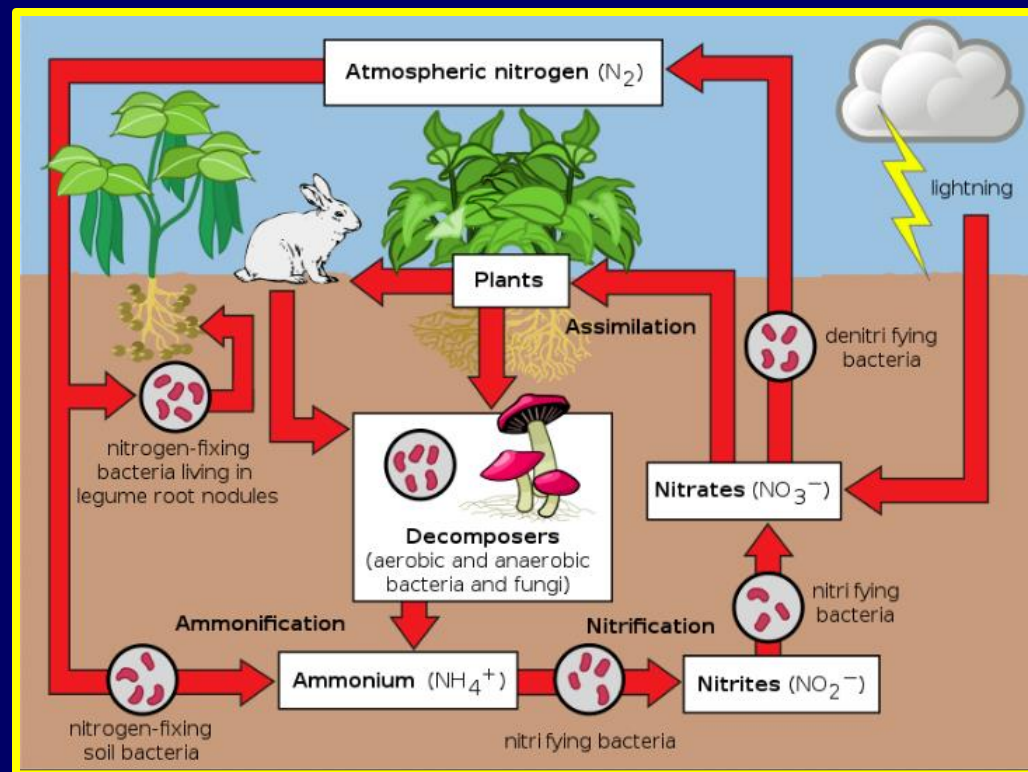
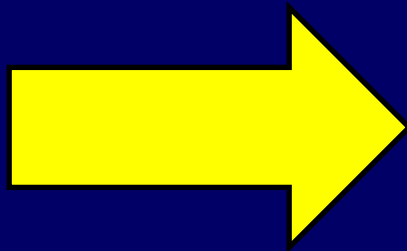
Nitrogen Cycle

The only organisms that are capable of breaking apart a nitrogen molecule, N_2 , into individual atoms of nitrogen, are nitrogen fixing bacteria that live in nodules on the roots of legume plants.



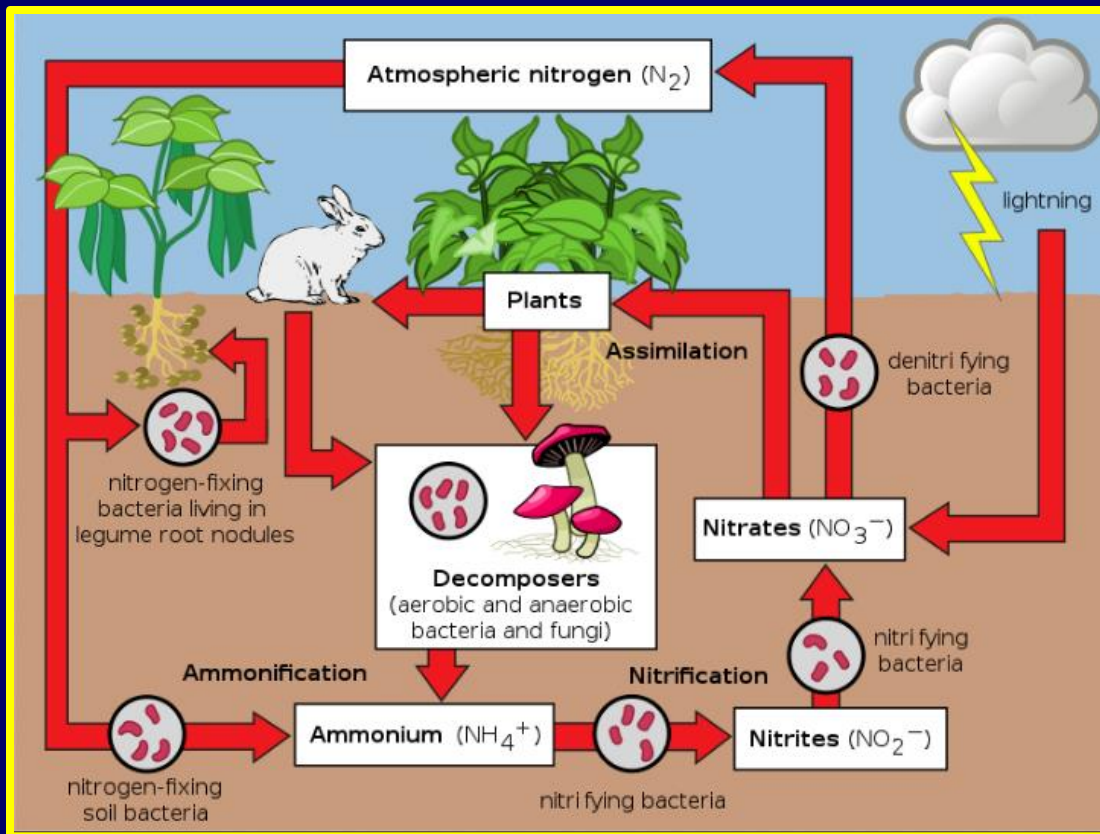
Nitrogen Fixation

Nitrogen fixing bacteria break apart atmospheric nitrogen (N_2) and chemically combine the nitrogen atoms (N) with hydrogen atoms (H), to form ammonium molecules (NH_4^+).



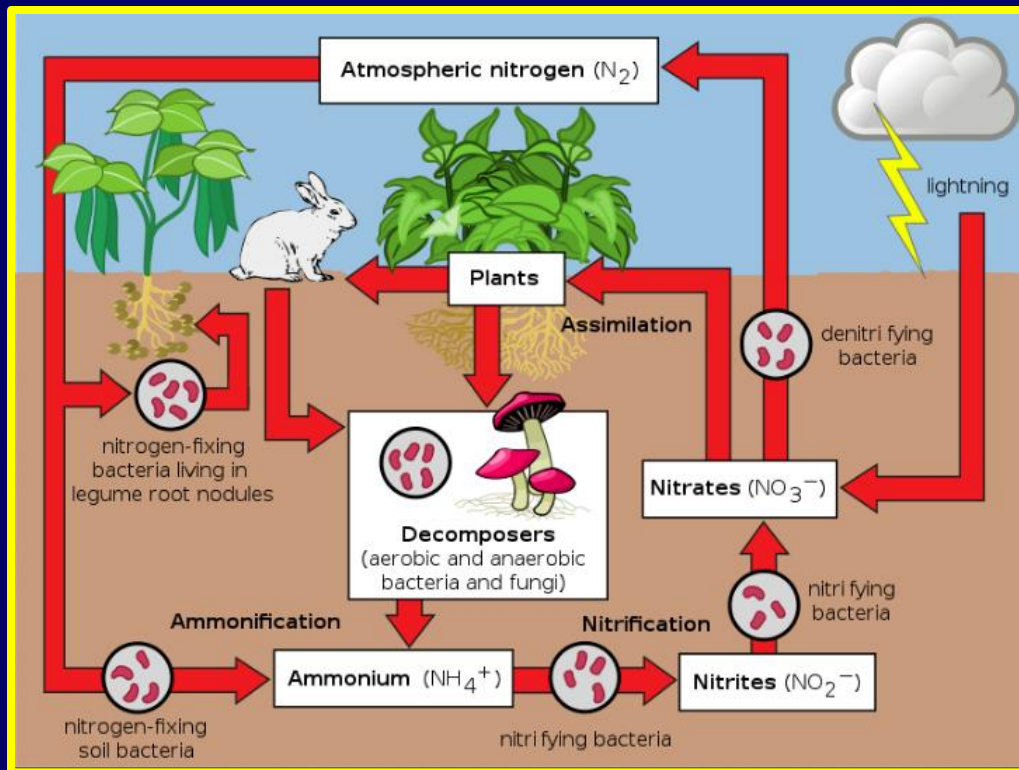
Nitrification

Other bacteria then chemically combine ammonium molecules (NH_4^+) with oxygen molecule (O_2) to form nitrites (NO_2^-) and nitrates (NO_3^-).



Protein and DNA

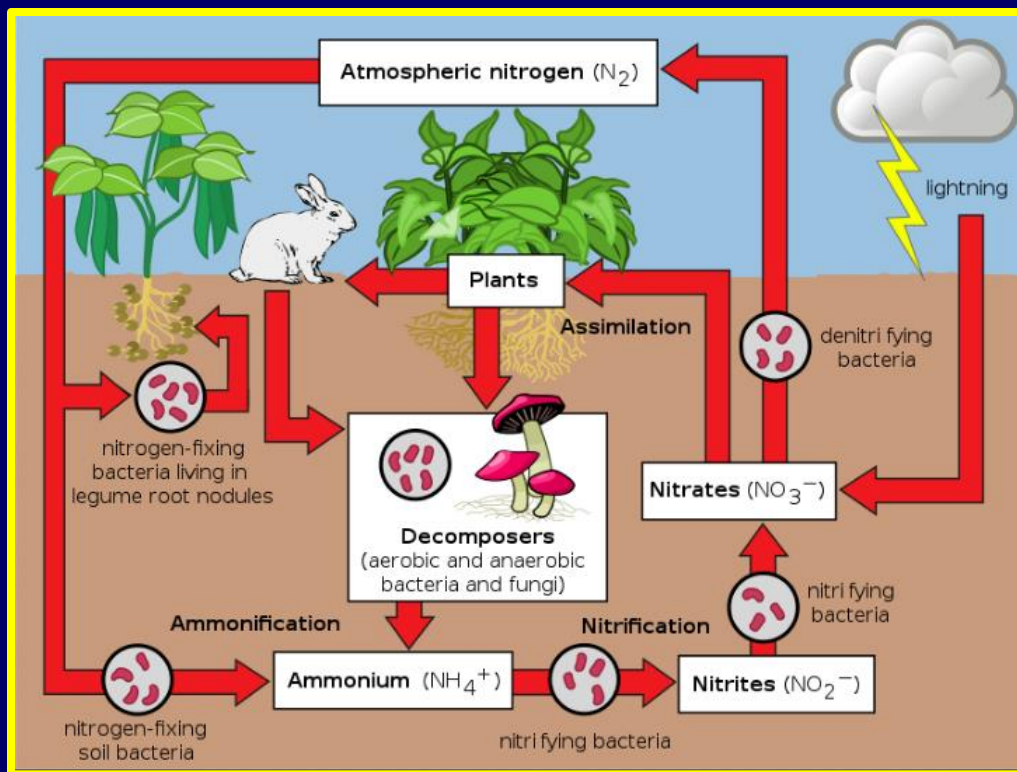
Plants take up nitrites (NO_2^-) and nitrates (NO_3^-) from the soil and use it to build DNA and protein molecules.



Animals obtain nitrogen, in order to make their own DNA and protein molecules, by eating plants or by eating other animals that already ate the plants.

Denitrification

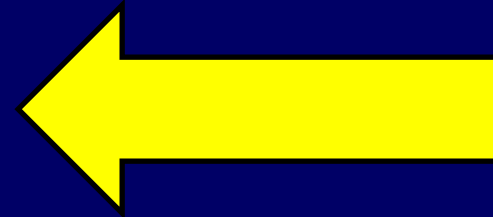
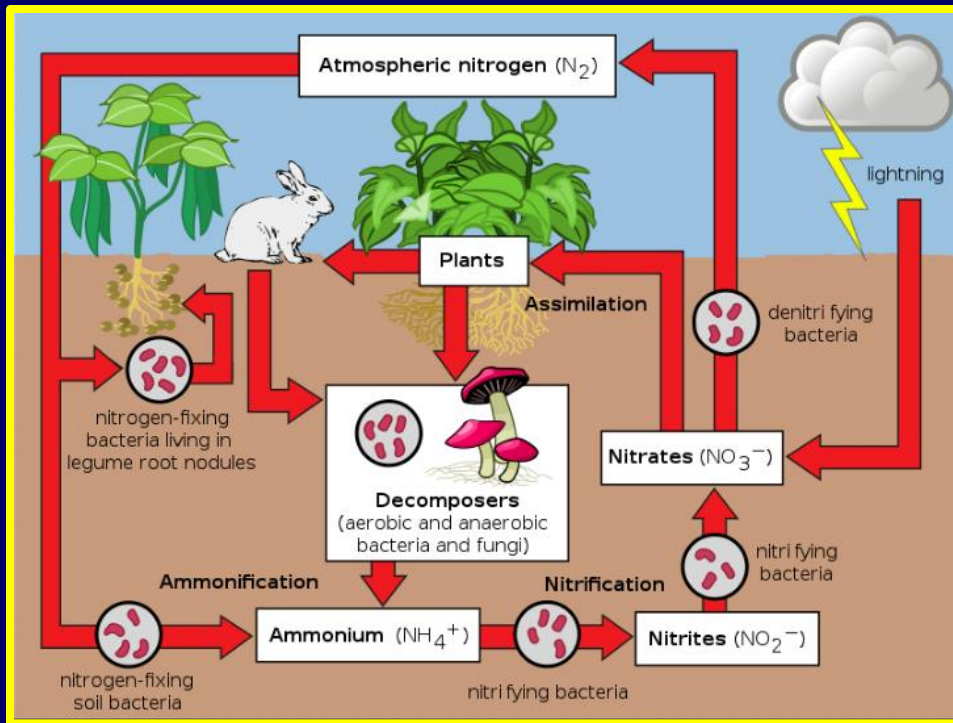
When plants shed their leaves or die and when animals excrete wastes or die, decomposers break down the wastes and return the nitrogen to the soil.



Denitrifying bacteria, in anaerobic soil, then return the nitrogen to the atmosphere.

Nitrogen Cycle

While most of the nitrogen cycle is driven by various types of bacteria, lightning can also convert atmospheric nitrogen (N_2) into a form that plants can use.



Inorganic Fertilizers

Lawns and crops that are not legumes, nor rotated with legumes, rely upon the constant addition of inorganic fertilizer.



The End

