

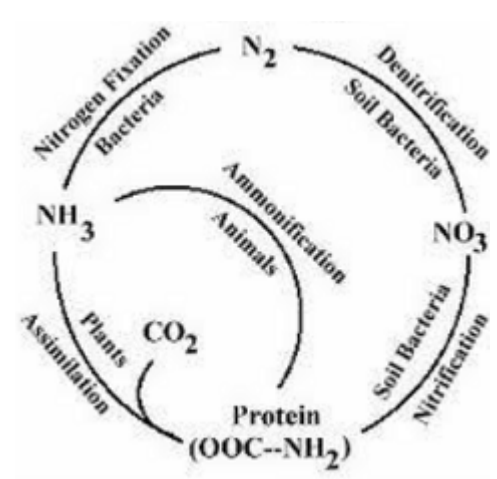
## Stages in Nitrogen Cycle

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The majority of [Earth's atmosphere](#) (approximately 78%) is [nitrogen](#). The nitrogen cycle is the process by which [nitrogen](#) is converted between its various chemical forms. Nitrogen in the air becomes a part of biological matter mostly through the actions of bacteria and algae in a process known as nitrogen fixation.

## Important Stages of Nitrogen Cycle

- [Fixation](#)
- Mineralization
- Ammonification
- [Nitrification](#)
- [Denitrification](#)



Nitrogen Cycle

## Nitrogen Fixation:

Organisms attain nitrogen.

78% of the atmosphere nitrogen gas can't be directly used by living organisms. The nitrogen gas is reduced to ammonia by nitrogen fixing bacteria. These bacteria live in all places like, soil, water as a free living bacteria or in the root nodules of legume plants (pea, clover plants)

This is the best example of the [mutualism](#) interactions. Because, plants gain useful nitrogen from the bacteria and the bacteria gain carbohydrates and protection from the plants.

Using the Haber process Nitrogen gas also is fixed to ammonia by human beings. Lightning fixes a small amount of nitrogen.



The Major stages of  
Nitrogen cycle

### Mineralization

After nitrogen is incorporated into organic matter, it is often converted back into inorganic nitrogen.

### Ammonification:

Detritus material consists of proteins. These proteins break down to form ammonia by saprophytes. It has two stages.

1. Extracellular protease enzymes digest proteins to amino acids.
2. Deaminase enzymes remove the amino groups from amino acids.

When plants or animals die or release waste the nitrogen is returned to the soil in the output of the [decomposers](#), is ammonia. Ammonia is toxic, but the nitrite bacteria in the soil and in the water which take up ammonia and convert it to nitrite, which is nitrogen with two oxygen.

### Nitrification:

Oxidation of ammonia into nitrate is done by the [Nitrifying bacteria](#). This happens in two stages:

- Forming nitrite ions then forming nitrate ions.
- Nitrogen in the form of nitrate only can be taken by plants.
- Nitrosomonas bacteria convert ammonia ( $\text{NH}_3$ ) to nitrite ( $\text{NO}_2^-$ )
- Nitrobacter bacteria convert nitrite ( $\text{NO}_2^-$ ) to nitrate ( $\text{NO}_3^-$ )

### Denitrification:

Conversion of nitrate into  $\text{N}_2$  and  $\text{NO}$  by the anaerobic [denitrifying bacteria](#) is called as denitrification. After this process the  $\text{N}_2$  lost to the air. We can note the constant loss of "useful" nitrogen from soil. That's why the nitrogen fixation is considered as an important biological process. Nitrite is bit toxic, but nitrate bacteria take nitrite and convert it to nitrate, which can be taken up by plants to continue the cycle.

Want to know more about the uses of Stages of nitrogen cycle? [Click here](#) to schedule live online session with e Tutor!

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## Reference Links:

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