

Water and Nitrogen Cycles

by Sophia

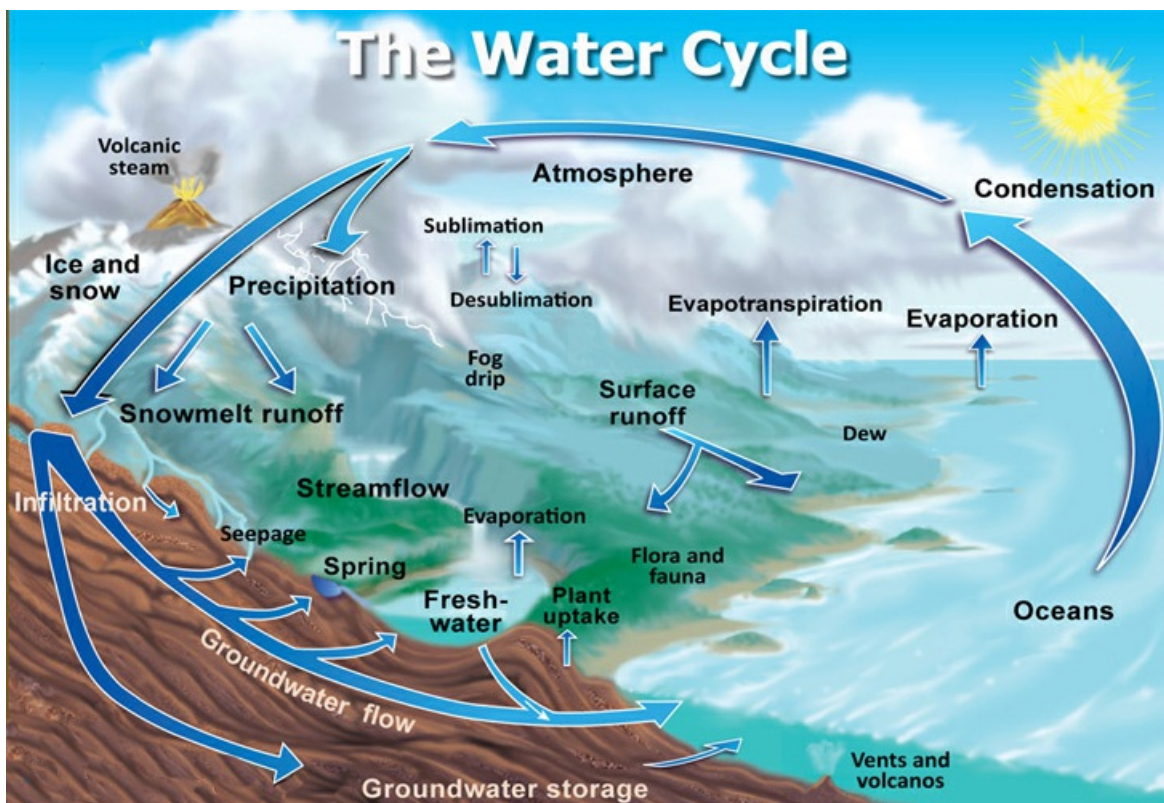


WHAT'S COVERED

In this lesson, we will discuss the water cycle and the nitrogen cycle. We will explore how water cycles between the ocean, atmosphere, and land, as well as the movement of nitrogen through living things and the atmosphere. We will also discuss the human impact on the nitrogen cycle. Specifically, this lesson will cover the following:

1. Water Cycle

The water cycle, illustrated in the diagram below, represents the cycling of water between three areas: ocean, atmosphere, and land.



The sun causes evaporation of water from water bodies such as rivers, lakes, oceans, swamps, mud puddles, and ditches, adding water to the atmosphere. Water can also enter the atmosphere through transpiration, which is the release of water vapor from plants.



DID YOU KNOW

The evaporation process naturally cleanses water.

Once water is in the atmosphere, it condenses and creates clouds through a process called condensation.

Once condensation has reached a certain point, water will fall down, which is a process called precipitation.

This water will join lakes, streams, and rivers, which eventually return to the ocean, completing the cycle.

Some precipitation will fall as snow and become compacted into glaciers. This takes the water out of the cycle until the glacier eventually melts.



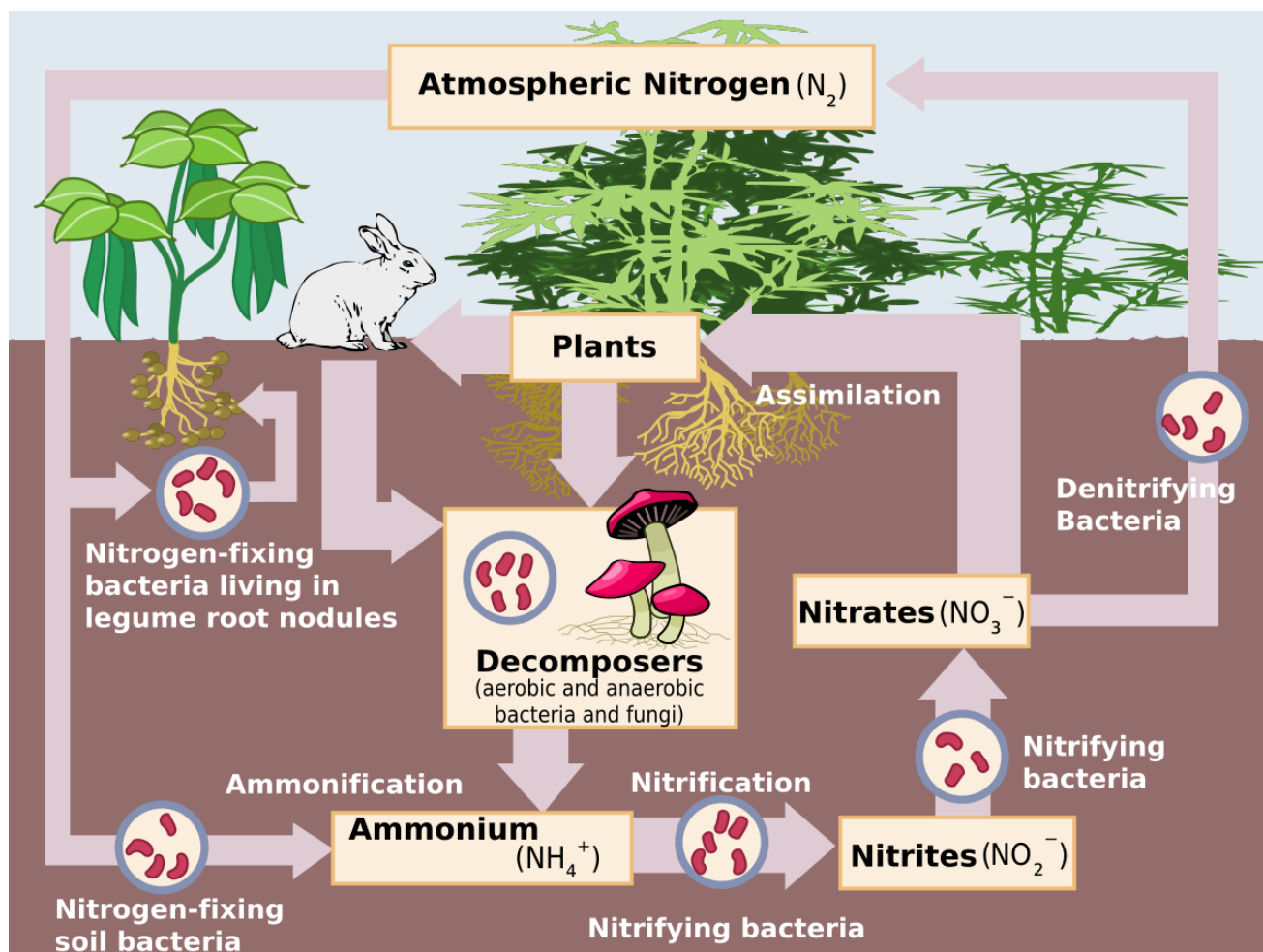
BIG IDEA

The water cycle recycles water, providing an ongoing supply of fresh water for life on land.

2. Nitrogen Cycle

The nitrogen cycle, illustrated below, is the movement of nitrogen through living things and the atmosphere.

Nitrogen is a gas that is found in the atmosphere. It is also an important biological element that is found in DNA and amino acids that make up proteins.



Atmospheric nitrogen is not usable by life forms, so it needs to be fixed in a form that is usable. Nitrogen fixation is the process through which atmospheric nitrogen, which makes up 78% of our atmosphere's composition, is converted into usable forms by microorganisms like bacteria. This type of bacteria lives on the roots of plants, such as legumes. Clover, alfalfa, soybeans, and peanuts are some examples of legumes.

Animals get this nitrogen by consuming plants and then building DNA, proteins, and muscle. In turn, they pass it back into the cycle through their urine or when they die.

Microorganisms then break down the nitrogen in the dead animal matter into usable forms again.

3. Human Impact on the Nitrogen Cycle

It is important to note that humans contribute to extra nitrogen in the cycle through runoff from agricultural fertilizers and animal waste. This extra nitrogen can cause harm to humans, animals, and various aquatic species. The excess nitrogen is primarily a problem in water systems where it can cause large algae blooms, which disrupt these aquatic ecosystems.

Most of the nitrogen used in fertilizers is created by an industrial chemical process, which uses natural gas and air to create usable nitrogen compounds. Agricultural nitrogen can be considered a pollutant.



SUMMARY

In this lesson, we learned about the **water cycle** and understood how water cycles between the oceans, the atmosphere, and land, providing an ongoing supply of fresh water for life on land. We also learned about the **nitrogen cycle** and how nitrogen—a gas found in the atmosphere—cycles through living things and the atmosphere. We also learned about the **human impact on the nitrogen cycle**.

Source: THIS TUTORIAL WAS AUTHORED BY JENSEN MORGAN FOR SOPHIA LEARNING. PLEASE SEE OUR [TERMS OF USE](#).



ATTRIBUTIONS

- [Water cycle](#) | **Author:** John Evans and Howard Periman, USGS | **License:** Public Domain
- [Nitrogen cycle](#) | **Author:** Johann Dréo | **License:** Creative Commons Attribution-Share Alike 3.0 Unported