

# Nutrient Cycling

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## What is Nutrient Cycling?

The nutrient cycle is the movement and exchange of organic and inorganic matter back into the production of matter. This means that all living and non-living organisms break down, then turn into nutrients for the ecosystem.

## Why is Nutrient Cycling important?

Nutrient cycling is one of the most important processes in an ecosystem, it turns old matter into nutrients that are used by other organisms. Without Nutrient cycling, organisms would not have access to certain nutrients needed to survive. It also keeps the balance of certain nutrients that are needed to keep an ecosystem life-sustaining. Without Nutrient Cycling ecosystems could become imbalanced, which would cause the ecosystems to fall apart.

## Common and important Nutrient Cycles:

**Water Cycle:** The Earth's surface is covered by about 71% of water, and 70% of plants, as well as animals, are composed of water, making it a very important aspect of life. So, let's go over how water is cycled within the environment. Water from plants, oceans, rivers, and lakes evaporate water into the atmosphere. Once the water is in the atmosphere, it condenses and cools which forms clouds. Once the clouds are full of water, it dumps the water in the form of precipitation (rain and snow). Thus, returning the water to the earth. The water can then, sink into the ground through the soil, or it can freeze. The water cycle continues to evaporate, condense, and precipitate.

**Carbon Cycle:** Carbon is the basic building block of all organic matter, as well as living organisms. Carbon is mainly found in the Earth's crust but is also found within oceans and the atmosphere. Carbon Dioxide naturally enters the earth's atmosphere through the photosynthesis of plants. During respiration (breathing or releasing of Carbon Dioxide) plants and animals (such as humans) release Carbon back into the air. Dead bodies of organisms also can accumulate Carbon, which is then decomposed and releases Carbon Dioxide back into the air. Of course, Carbon Dioxide is also released by fossil fuels, which is not

part of the organic cycle of Carbon Dioxide. Fossil fuels release far more CO<sub>2</sub> into the atmosphere than can be recuperated naturally.

**Nitrogen Cycle:** Nitrogen is the most abundant gas in our atmosphere. Nitrogen cannot be used in its natural form by living organisms other than bacteria. It must be combined with other elements such as oxygen or hydrogen. Nitrogen can go through a process that turns into ammonia which is called Nitrogen Fixation, Nitrogen then is used by plants. Other forms of the Nitrogen Cycle include Lightening, Absorption (when ammonia and nitrates are absorbed by plants), Ingestion (when animals and humans eat the plants), and Decomposition (when Fungi and Bacteria break down dead organisms).

**Oxygen Cycle:** Oxygen is required for all living things. It is present in the air as well as water, it can be recycled between air as well as living organisms by the forms of breathing (which is known as respiration), such as animals taking in oxygen, and photosynthesis when plants release oxygen. There is an important relationship between respiration (breathing) and photosynthesis. When animals breathe (respire) they release Carbon Dioxide, which is important for plants to go through photosynthesis, and of course, plants release the oxygen that animals and humans breathe.

### **Decomposers and why they are important for Nutrient Cycling:**

Decomposers such as fungi and bacteria break down dead organisms to cycle the nutrients that are present in the organism. After the decomposer cycles the nutrients, it is then put into the soil thus causing important nutrients to be used again. If there were no decomposers, waste and remains of dead organisms would pile up, making for a very smelly planet. Producers (plants) would not get the nutrients needed to grow as well as perform their important duty, which is to form oxygen for us to breathe. Causing essentially a lot of organisms such as ourselves to not exist.

# Resources:

<https://springpowerandgas.us/nutrient-cycling-what-you-need-to-know/>- July 8th, 2020

<https://www.yourarticlelibrary.com/environment/ecosystem/4-common-biogeochemical-cycles-explained-with-diagram/28229>- Puja Mondal

<https://www.ck12.org/biology/consumers-and-decomposers/lesson/Consumers-and-Decomposers-MS-LS/>- Jessica Harwood and Douglas Wilkin, Ph.D. May 18, 2020

<https://intl.siyavula.com/read/science/grade-10-lifesciences/biosphere-to-ecosystems/08-biosphere-to-ecosystems-07#:~:text=A%20nutrient%20cycle%20refers%20to,Nutrient%20cycles%20occur%20within%20ecosystems.->