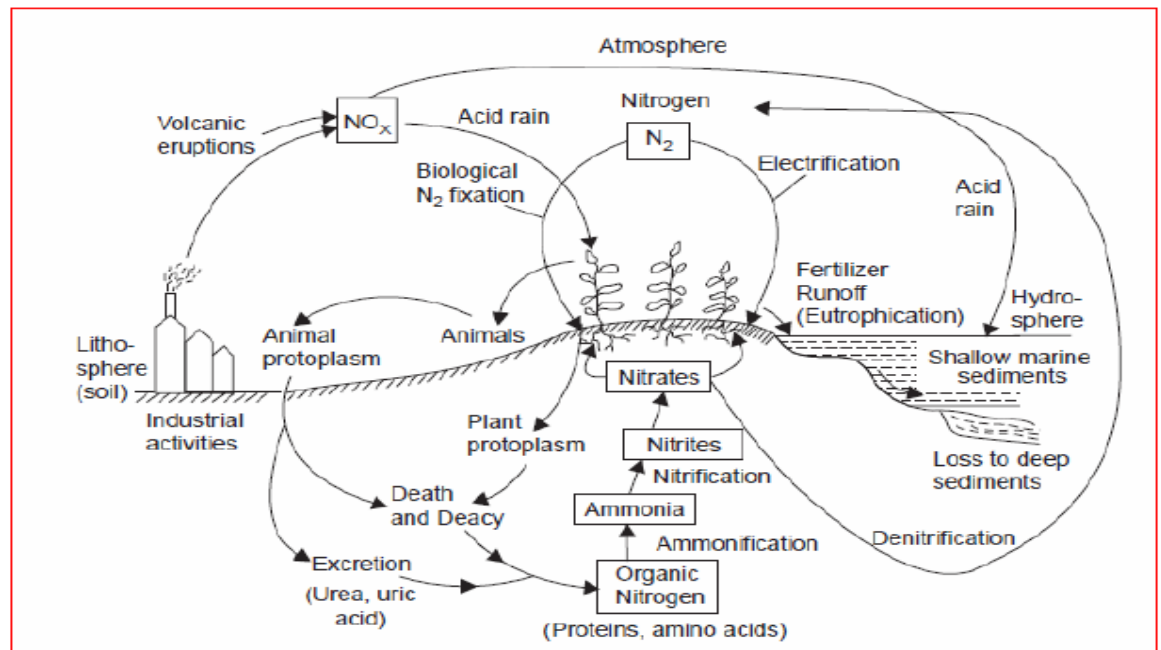


# Nitrogen Cycle

- Nitrogen is present in the atmosphere as  $N_2$  in large amount (78%) and it is fixed either by the physical process of lightening or biologically by some bacteria and/or cyanobacteria (blue green algae).
- The nitrogen is taken up by plants and used in metabolism for biosynthesis of amino acids, proteins, vitamins etc. and passes through the food chain.
- After death of the plants and animals, the organic nitrogen in dead tissues is decomposed by several groups of ammonifying and nitrifying bacteria which convert them into ammonia, nitrites and nitrates, which are again used by plants.
- Some bacteria convert nitrates, into molecular nitrogen or  $N_2$  which is released back into the atmosphere and the cycle goes on.



**Nitrogen Cycle**

**Oxygen cycle:** The oxygen cycle is the biogeochemical cycle that describes the movement of oxygen within its three main reservoirs: the atmosphere (air), the total content of biological matter within the biosphere (the global sum of all ecosystems), and the lithosphere (Earth's crust). Failures in the oxygen cycle within the hydrosphere (the combined mass of water found on, under, and over the surface of planet Earth) can result in the development of hypoxic zones.

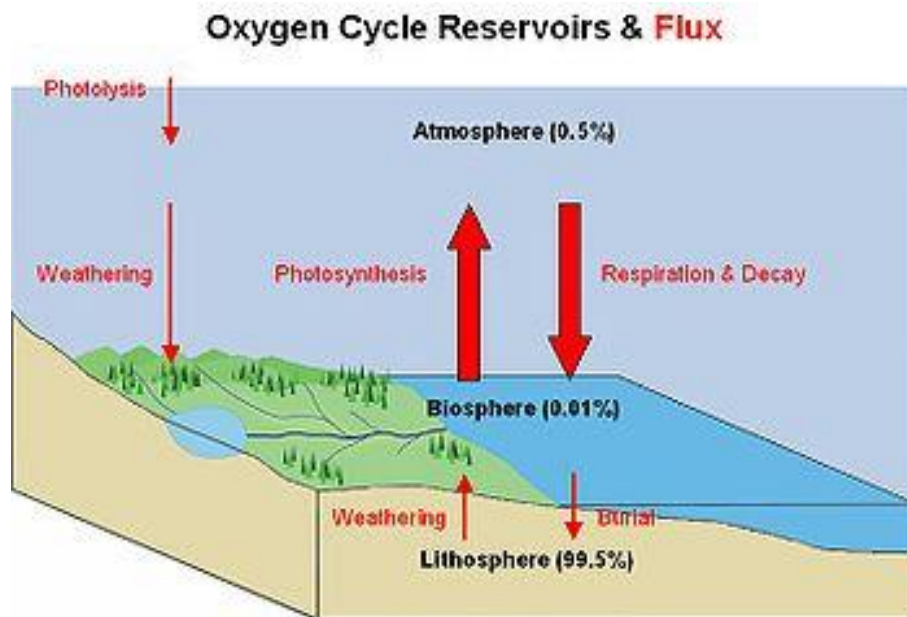
The main driving factor of the oxygen cycle is photosynthesis and sometimes through **Photolysis** atmospheric oxygen is created when sun reacts with the watervapour

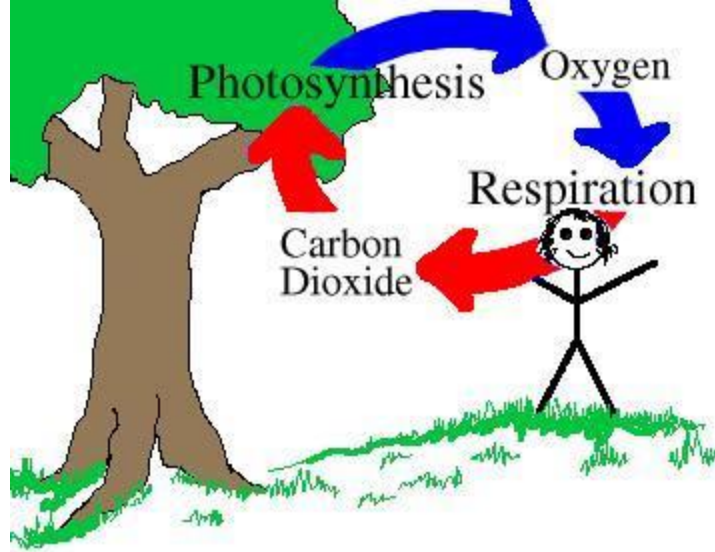
Almost all living things need oxygen. They use this oxygen during the process of creating energy in living cells.

Oxygen is used for the decomposition of dead animals.

The process of rusting, also called oxidation, occurs when oxygen combines with metal.

Fire is a chemical reaction that involves Oxygen.





## 1.photosynthesis

Plants mark the beginning of the oxygen cycle. Plants are able to use the energy of sunlight to convert carbon dioxide and water into carbohydrates and oxygen in a process called photosynthesis.



This means that plants "breathe" in carbon dioxide and "breathe" out oxygen. So oxygen is created in plants and used up by animals, as is shown in the picture above. But the oxygen cycle is not actually quite that simple. Plants must break carbohydrates down into energy just as animals do. During the day, plants hold onto a bit of the oxygen which they produced in photosynthesis and use that oxygen to break down carbohydrates. But in order to maintain their metabolism and continue respiration at night, the plants must absorb oxygen from the air and give off carbon dioxide just as animals do. Even though plants produce approximately ten times as much oxygen during the day as they consume at night, the night-time consumption of oxygen by plants can create low oxygen conditions in some water habitats.

2. Animals form the other half of the oxygen cycle. We breathe in oxygen which we use to break carbohydrates down into energy in a process called respiration.

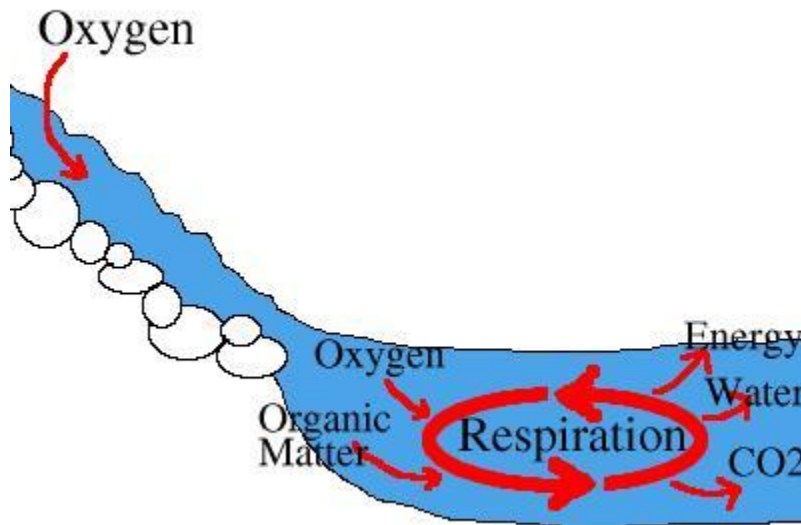


Carbon dioxide produced during respiration is breathed out by animals into the air.

## Oxygen in Water:

Oxygen in water is known as dissolved oxygen or DO. In nature, oxygen enters water when water runs over rocks and creates tremendous amounts of surface

area. The high surface area allows oxygen to transfer from the air into the water very quickly.



When the water in a stream enters a pond, microorganisms in the pond begin to metabolize (break down) organic matter, consuming oxygen in the process. This is another form of oxygen cycle - oxygen enters water in rapids and leaves water in pools.

Oxygen uptake rate (O.U.R.) is the rate at which oxygen is consumed by living organisms in the water. Since organisms are constantly using up oxygen in the water and oxygen is constantly reentering the water from the air, the amount of oxygen in water remains relatively constant. In a healthy ecosystem, the rates of oxygen transfer (being used up) and oxygen uptake are balanced in the water.