

Read About Photosynthesis & Respiration

WHAT IS PHOTOSYNTHESIS & RESPIRATION?

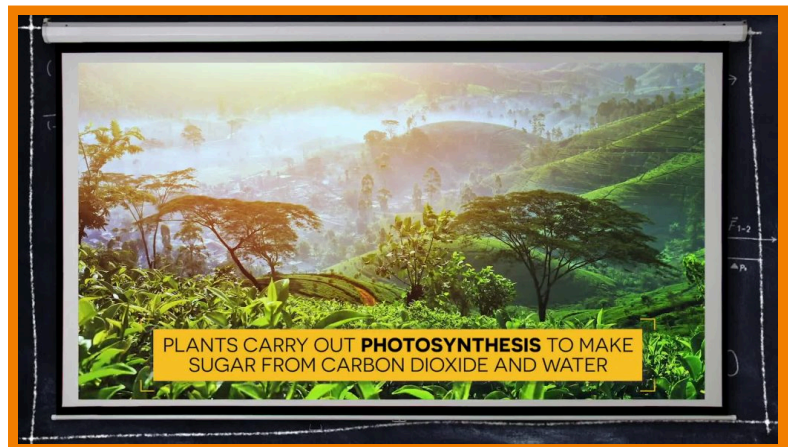
Photosynthesis and cellular respiration are chemical processes that demonstrate one way matter is cycled through the ecosystem. Neither matter nor energy can be created or destroyed, and both move through systems. Matter is cycled through a system, and energy flows through a system using inputs and outputs.

To better understand photosynthesis & respiration...

LET'S BREAK IT DOWN!

Photosynthesis

Photosynthesis is the chemical process in which carbon dioxide and water combine using energy from the Sun to make sugar and oxygen. Photosynthesis is used by plants and other organisms, such as algae and cyanobacteria, to synthesize (make) their own food.



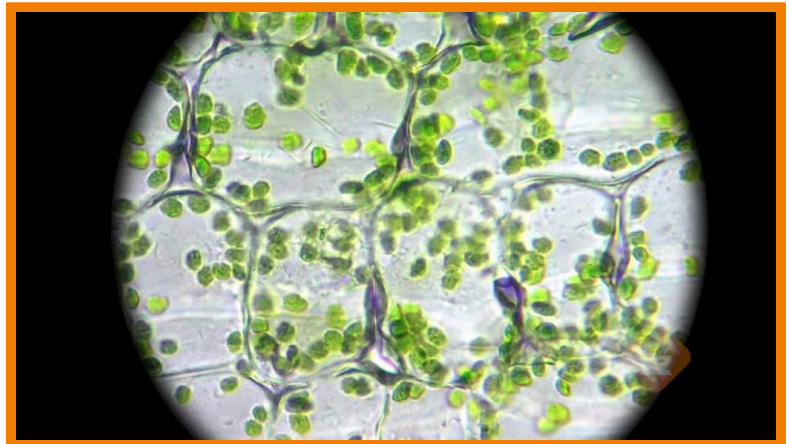
Cellular Respiration

The chemical process in which stored energy is broken down so it can be used by an organism to survive when there is no food source available. Cellular respiration is a multi-step process with different amounts of energy being produced at each step. Both plants and animals go through cellular respiration to access and use stored energy.



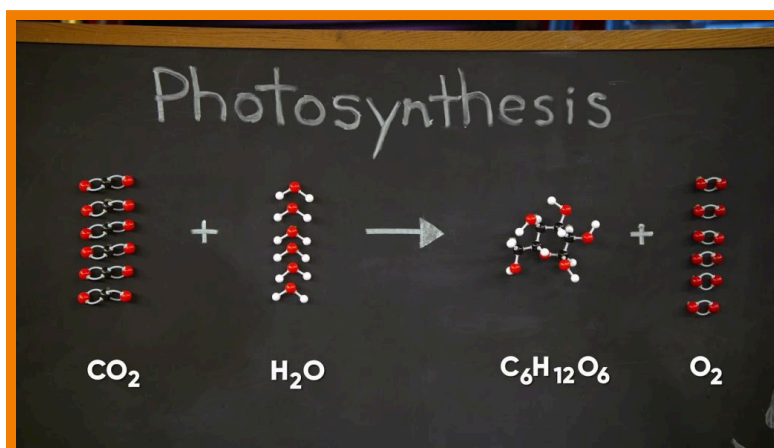
These processes happen at the micro scale.

The prefix micro is used to describe things that are too small to be seen. Microorganisms are living things that are too small to be seen, such as individual cyanobacteria and other phytoplankton. Microscopic objects refer to nonliving things we cannot see, such as atoms and individual molecules of water and gas.



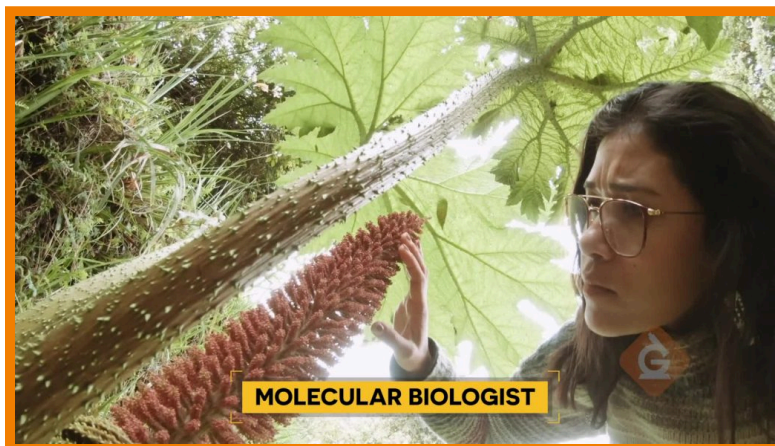
Law of Conservation of Mass

The law of conservation of mass is the principle that mass cannot be created or destroyed. Mass is cycled through and between different systems as it changes through chemical reactions. In photosynthesis and cellular respiration the number of atoms on both sides of the reaction is the same. The atoms are simply regrouped.



Careers in Science: Molecular Biologist

A biologist is a scientist who studies living things. A molecular biologist studies the processes that make cells work, including the processes of photosynthesis and cellular respiration. Photosynthesis is a process that turns sunlight into chemical energy. Since humans need energy for everything we do, we can harness photosynthesis to make chemical or electrical energy. Many scientists are working on improve solar cells by learning from plants.



PHOTOSYNTHESIS & RESPIRATION VOCABULARY

Photosynthesis

The chemical process in which carbon dioxide and water combine, using energy from the Sun, to make sugar and oxygen.

Cellular respiration

The chemical process in which stored energy is broken down so it can be used by an organism to survive when there is no food source available.

Water

A substance that is made from two hydrogen atoms and one oxygen atom and is needed to sustain life.

Carbon dioxide

A gas that contains one carbon atom and two oxygen atoms.

Molecule

A group of atoms bonded together.

Cyanobacteria

A microorganism that uses the process of photosynthesis to make food and is often called blue-green algae.

PHOTOSYNTHESIS & RESPIRATION DISCUSSION QUESTIONS

What is the process of photosynthesis?

Photosynthesis is the chemical process in which plants and other organisms combine carbon dioxide and water, using energy from the Sun, to produce sugar and oxygen.

What is the process of cellular respiration?

Cellular respiration is the chemical process that occurs when an organism breaks down the food it has stored (sugars and fats) and uses it for energy.

Besides plants, what are examples of other organisms that use photosynthesis?

Some bacteria, such as cyanobacteria, go through photosynthesis and so do algae.

Compare the similarities and differences between how plants and animals get the food they need for survival.

Plants and animals both need food to survive. Animals get their food from eating plants and other animals. Plants get their food by using carbon dioxide, water, and sunlight to make sugar.

Explain how scientists know the oxygen level in the atmosphere has changed because of plants. Could our atmosphere still be changing?

Scientists have studied bubbles trapped in glaciers, which showed that oxygen levels a long time ago were very low. As more photosynthetic organisms started to grow, the oxygen levels started to rise. Yes, the atmosphere is still changing because we keep putting other things in the air, like pollution.

Describe the oxygen/carbon dioxide cycle using plants and animals.

In a fishbowl, there is a fish and a plant. The fish uses oxygen from the water and releases carbon dioxide. The plant then uses that carbon dioxide, water, and sunlight to make sugar and

then it releases oxygen back into the water. The gases keep getting changed over and over.
