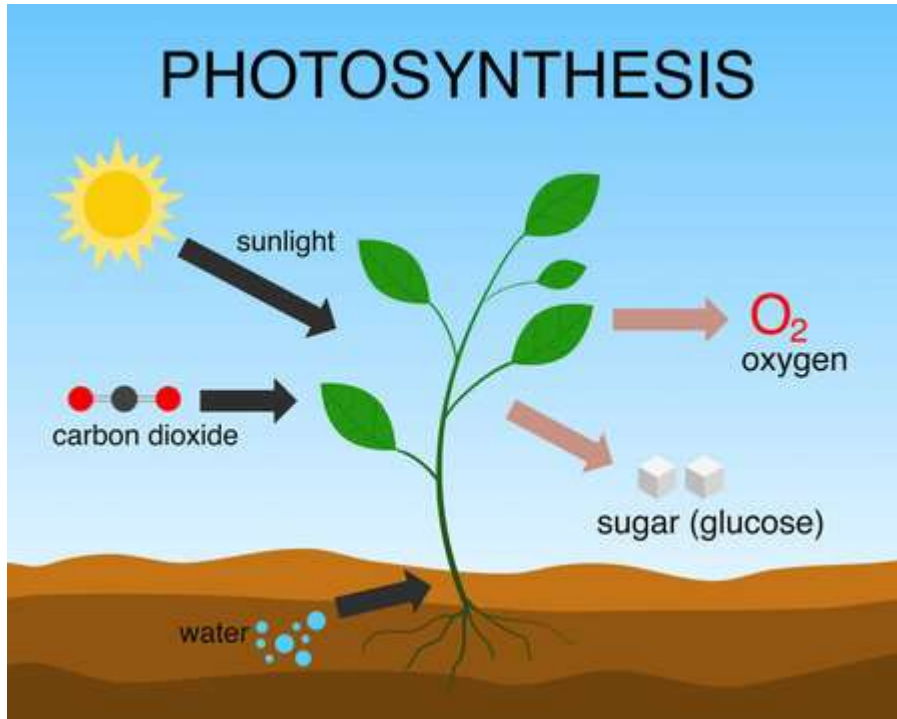


Energy and Matter in Ecosystems Review:

1) Photosynthesis:

- a. Photosynthesis occurs when plants combine carbon dioxide and water with energy from sunlight to make glucose and oxygen.
- b. The transformation of sunlight into the chemical energy of glucose takes place most often in the leaves of plants. Leaves take in sunlight and use its energy in a process that makes chemical energy. Some of this energy is used by producers to live. The rest of the energy is stored in the plant.
- c. Nearly all the energy of life starts with the sun and from the glucose that is made by producers such as plants, algae, and phytoplankton. Producers use the chemical energy in glucose to live. But plants and other producers are eaten by consumers. Therefore, producers are always the bottom of food chains.



2) Producers and Consumers.

- a. A producer is a living thing that makes its own food, usually through photosynthesis. Producers are able to make their own food, within themselves, without having to move. Plants and algae are producers and are at the bottom of food chains.
- b. A consumer is a living thing that gets energy by eating other organisms for food. There are several different kinds of consumers:
 - i. Herbivores, such as cows, deer, or crickets, eat plants to get energy.
 - ii. Carnivores, such as cats or wolves, eat meat or other consumers to get energy.
 - iii. Omnivores, such as bears and racoons, can eat either producers or other consumers to get their energy.
 - iv. Scavengers, such as vultures or crabs, eat organisms which have already died.
 - v. Decomposers, such as fungi or bacteria, eat and break down dead plant and animal matter and return the nutrients to the soil.

3) Energy and matter are constantly flowing through all ecosystems.

- a. The source of all energy in most ecosystems is the sun. Through photosynthesis, plants take the energy from the sun, alongside carbon dioxide and water, and convert the energy from the sun into a chemical energy called Glucose.

- b. Other organisms then come along and eat the plants and through metabolism, convert that glucose into energy which they can use to breathe, move, stay warm, and live. They also use the matter from the plants to grow their own cells and bodies.
- c. Some consumers then come along and eat the first consumers and use the matter from their bodies to gain energy to live as well as matter to grow.
- d. Overall, energy in the ecosystem comes from the sun and moves up the food chain matter to the apex predators. Matter in ecosystems starts with producers growing from the water, air, and soil, and then other organisms eat those producers and use that matter to grow.

4) **Food Chains and Food webs.**

- a. A food chain is a series of organisms listed in a way that shows which is a food source for another. It shows a flow of energy through an ecosystem. It is called a food chain because each organism serves as an important link for transferring energy and matter.



- b. A food web is multiple connected food chains in an ecosystem. The arrows in the food web diagram point from the organism that is the food source toward the organism that eats each food. Animals that have no arrow pointing away from them are the top consumers. This means that there is nothing that eats them. The top consumers are usually found at the top of a food web, and they are often predators.

