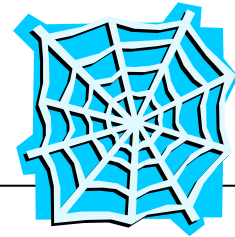


Energy Transfers



Every organism in an estuary plays an important role. Even tiny life forms, so small they can be seen only with a microscope, play important roles.

The ultimate source of energy for all life on earth is the sun. Plants have a very special ability that no other organisms have. Through **photosynthesis**, plants use energy from the sun to make their own energy. Within their cells, plants use sunlight energy to convert water (H₂O) and carbon dioxide (CO₂) to sugar (C₆H₁₂O₆) and oxygen (O₂). The plants use the sugar they make for energy to live and grow.

Plants carry out the role of transforming energy from the sun and nutrients from the air and soil into life forms. The name of their ecological role is called **Producers**. Producers are the basis of all food webs. Animals perform other ecological roles. Animals that feed exclusively on plants are called **Herbivores**. Animals that eat other animals are called **Carnivores**. If you were near an estuary 200 million years ago, you might have seen an herbivorous (plant-eating) Brontosaurus get attacked by a carnivorous (meat-eating) Tyrannosaurus Rex. Animals that eat both plant and animal foods are called **Omnivores**. *Are you a Producer, Herbivore, Carnivore, or Omnivore?*

A final ecological role is being a **Decomposer**. Decomposers are organisms that consume dead plant and animal matter. Some animals, such as vultures and beetles, carry out this role. Yet, by far the majority of decomposers are organisms we hardly notice. Fungi and microscopic bacteria decompose most of the dead plant and animal matter on the planet. They break the matter down to smaller pieces called detritus, which many other animals can eat. Decomposers help to complete the cycle of recycling nutrients and energy through the ecosystem. Other organisms can then eat the decomposers. Sometimes we take our little known decomposers for granted because we don't notice their actions. However, can you imagine what life would be like without them?

There is another important ecological process that we often take granted. As mentioned above, plants produce oxygen gas in addition to sugar during photosynthesis. Although we can't see this process, it is vital to our survival-it allows us to keep breathing fresh air! We share a vital connection with plants. Plants produce the oxygen that animals breathe. Animals exhale carbon dioxide, and plants absorb that carbon dioxide. They use it to carry out more photosynthesis and produce more oxygen. And so the cycle goes. Amazingly, our main source of oxygen comes from plants we hardly notice: phytoplankton. Most of earth (70%) is covered with water. Therefore, the greatest contributors of oxygen come from an aquatic plant group: **phytoplankton**.