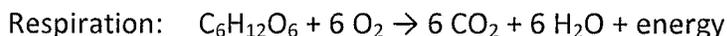
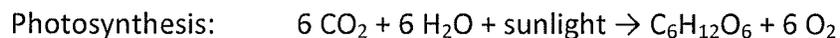


## Photosynthesis and Respiration

Photosynthesis and respiration are part of the nutrient cycle.

A common misconception is that plants “create” energy through photosynthesis. Although plants, and other producer, do use the process of photosynthesis they do not “create” the energy. Another misconception is that animals use the energy from plants as food. This is a partial misconception in two ways. Not just animals, but most living organisms use the energy from the photosynthesis process to do work, which includes plants, animals, fungi, and bacteria. Another part of the misconception is how the energy is “used”, being that there is no account for where the energy goes once it is used. How energy is utilized is briefly covered here.

Producers, such as plants, use the energy from sunlight to combine carbon dioxide and water into glucose, a type of sugar, through the photosynthesis process. Most living organisms utilize glucose and oxygen as an energy source for work. The chemical equations for these processes are:



NOTE: The above equations are a convenient simplification of the process and are presented in this form as age appropriate.

NOTE: The use of chemical equations may not be appropriate to all classrooms, but are provided to show that matter cycles between the photosynthesis process and the respiration process.

These equations are read, “6 carbon dioxide molecules and 6 water molecules and sunlight react to make one glucose molecule and 6 oxygen molecules,” and, “one glucose molecule plus 6 oxygen molecules react to make 6 carbon dioxide molecules and 6 water molecules and energy.”

The energy from sunlight is used to rearrange the carbon dioxide and water into the glucose, so that the glucose has *chemical potential energy*. When the glucose is utilized the rearrangement of the glucose back into carbon dioxide and water converts the *chemical potential energy* into energy available to do work. This energy can be used to make something move, help something grow, or as heat to keep something warm.

## Questions

- What organisms use photosynthesis?
- What organisms use respiration?
- Why is photosynthesis important to the nutrient cycle?
- Where does the energy for photosynthesis come from?
- Matches are made of wood. Where does the energy to make the wood of the match come from?
- How is burning a match similar to the respiration process in your body?