Probably the most important series of endothermic reactions on Earth is photosynthesis. Many steps occur in the process, but the overall chemical reaction is

$$6\text{CO}_2 + 6\text{H}_2\text{O} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$$

Unlike many other endothermic reactions, photosynthesis does not absorb energy as heat. Instead, during photosynthesis, plants absorb energy from sunlight to turn carbon dioxide and water into oxygen and glucose, which is a type of sugar molecule. The energy is stored in the glucose molecules, ready to be used when needed.

CHECK YOUR READING How can you determine if a reaction is endothermic?

**Exothermic and endothermic reactions work together to supply energy.**

When you think about exothermic and endothermic reactions, consider energy to be part of the reaction. An exothermic reaction releases energy, so energy is on the product side of the chemical equation. An endothermic reaction absorbs energy, so energy is on the reactant side of the chemical equation.

**Exothermic Reaction**

Reactants $\rightarrow$ Products + Energy

**Endothermic Reaction**

Reactants + Energy $\rightarrow$ Products

As you can see in the general reactions above, exothermic and endothermic reactions have opposite energy changes. This means that if an exothermic chemical reaction proceeds in the opposite direction, it becomes an endothermic reaction that absorbs energy. Similarly, if an endothermic reaction proceeds in the opposite direction, it becomes an exothermic reaction that releases energy.

CHECK YOUR READING What happens when an exothermic reaction is reversed?

A large amount of the energy we use on Earth comes from the Sun. This energy includes energy in fossil fuels such as coal and petroleum, as well as energy obtained from food. In all of these cases, the energy in sunlight is stored by endothermic reactions. When the energy is needed, it is released by exothermic reactions.

This combination of reactions forms a cycle of energy storage and use. For example, examine the photosynthesis equation at the top of the page. If you look at this equation in reverse—that is, if the direction of the arrow is reversed—it is a combustion reaction, with oxygen and glucose as the reactants, and it is exothermic.