Background Information

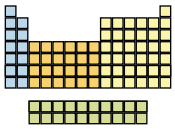
How does photosynthesis work?

Photosynthesis is a complex series of chemical reactions which provide plants with energy and mass. **The atoms involved are oxygen, hydrogen, and carbon.**

O Oxygen Atom (O)

H Hydrogen Atom (H)

C Carbon Atom (C)



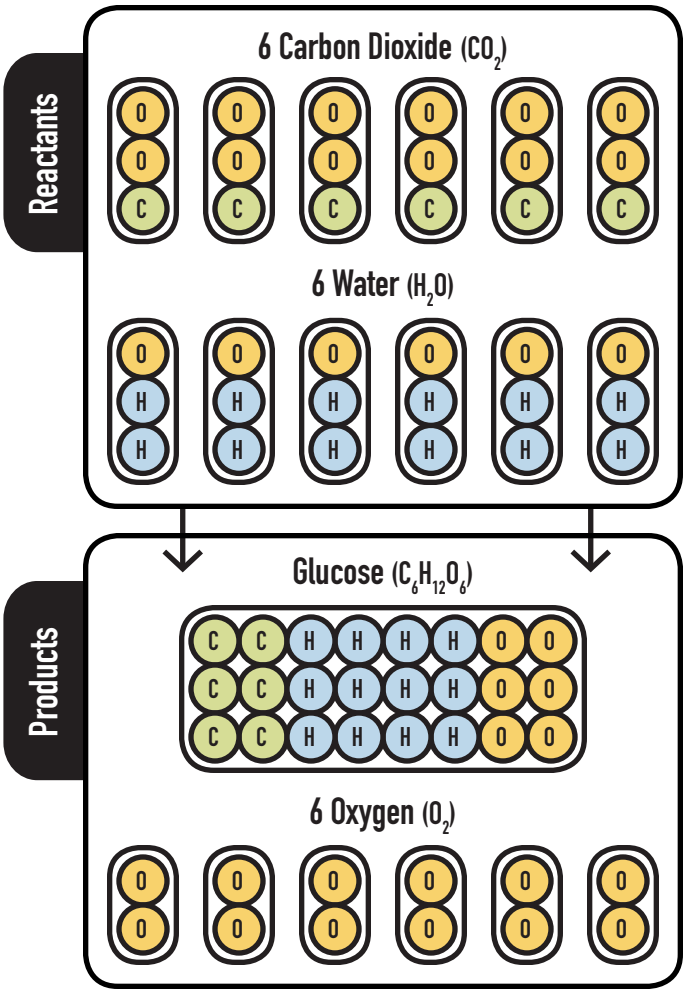
Atoms are the smallest units of matter that form elements. Atoms join together to form **molecules**. Water is a molecule made of hydrogen and oxygen atoms.

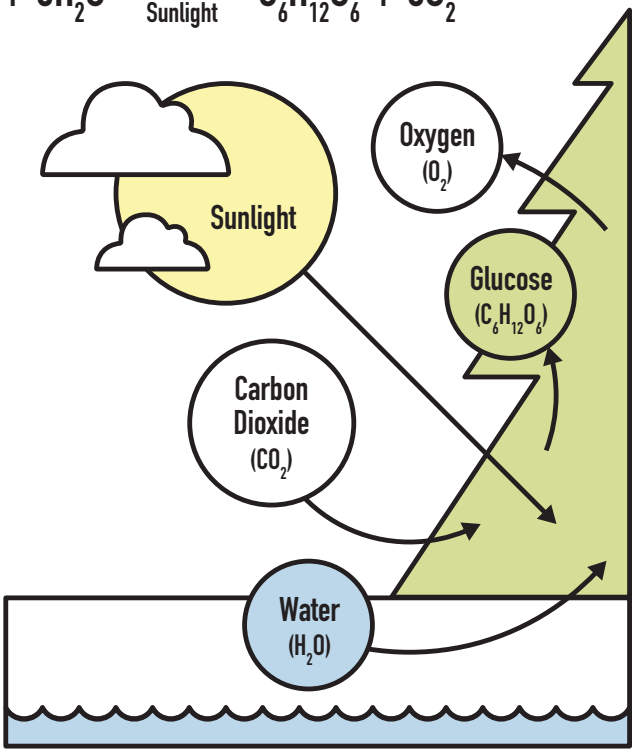
The quantity of atoms in a molecule is indicated by a number. For example, water (H_2O) has two hydrogen and one oxygen atom.

Water Molecule (H_2O)

When a **chemical reaction** occurs, the atoms of one set of substances (reactants) are rearranged to form different substances (products). Reactions either take in energy (endothermic) or give off energy (exothermic). Photosynthesis is an **endothermic** reaction, because it takes in energy from the sun. These processes are represented as **chemical equations**.

Chemical Equation for Photosynthesis $6CO_2 + 6H_2O \xrightarrow{\text{Sunlight}} C_6H_{12}O_6 + 6O_2$





During photosynthesis, carbon dioxide and water are converted into glucose and oxygen. Trees play an important role in the **carbon cycle** because they take carbon dioxide from the atmosphere, use the carbon to create glucose, and release the oxygen.