

How Living Things Get Energy

Photosynthesis and Cellular Respiration

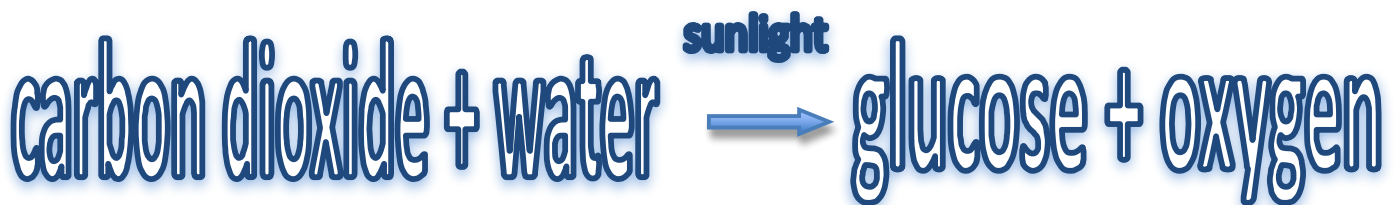
All living things need energy to live. (Remember the requirements for life: cellular organization, reproduction, homeostasis, heredity, evolution, interdependence, and *metabolism*). So, how do living things get their energy?

Plants and animals use glucose as fuel. Glucose is a monosaccharide (remember monosaccharides are simple sugars and are organic molecules). Energy is produced when oxygen combines with glucose in a process called *cellular respiration*.

Where do plants and animals get glucose? Plants are *autotrophs* – they make their own food. Animals are *heterotrophs* – they need to ingest food. The process that creates the glucose that plants and animals use as fuel is *photosynthesis*, the process that uses glucose to make energy is *cellular respiration*.

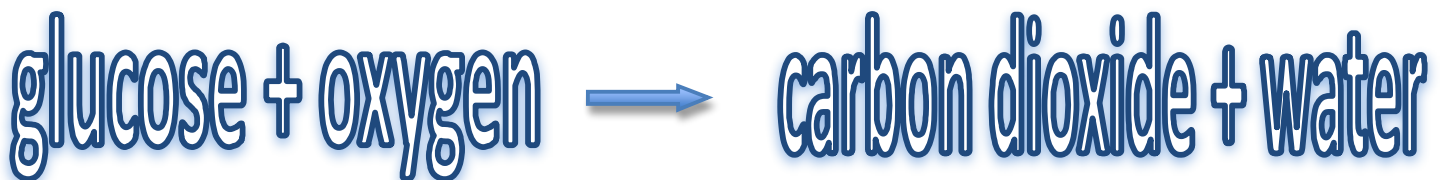
Photosynthesis occurs in the leaves of green plants. Plants have organelles that animals do not – *chloroplasts*. Chloroplasts contain the pigment *chlorophyll*. Chlorophyll traps light energy from the sun. Do not get confused chloroplasts are organelles; chlorophyll is the substance in chloroplasts. To perform photosynthesis plants need three things: carbon dioxide (CO₂), water (H₂O) and sunlight. Water enters through the roots; carbon dioxide enters through tiny holes in the leaves called stomata.

The equation for photosynthesis is:



This is read “carbon dioxide and water in the presence of sunlight yields glucose and oxygen”.

Cellular respiration occurs in the *mitochondria* of plants and animals. The equation for cellular respiration is:



This is read “glucose and oxygen yields carbon dioxide and water”.

Photosynthesis and Cellular Respiration

Complete this page and turn it in. Keep page one in your notes.

Notice that the products (ingredients on the right) and the reactants (ingredients on the left) are opposite in these equations. What does that tell you about these reactions?

What type organic molecule is glucose?

Define the bold terms on page 1: