

Plants Are Made from Thin Air?

CO₂ from the air gets incorporated into a glucose molecule.
Then, the glucose molecule becomes part of the plant.

Photosynthesis

Plants make their own food – a sugar molecule called glucose. Water molecules and carbon dioxide molecules are combined to produce sugar molecules (glucose). Some oxygen molecules are left over and are given off. Sunlight provides the energy for the process. The food factories are located in the leaves.

Three ways plants use glucose:

1) Glucose can be used for quick energy.

Glucose travels through the plant's veins to different parts of the plant.

2) Glucose can be made into plant structures.

When glucose molecules are linked end to end in a special way, they form a long, strong molecule called cellulose. Cellulose is found in leaves, veins, and stems. Cellulose is actually the major component of wood! Did you know that every single cell in a plant is covered with a thick layer of cellulose? It's called the cell wall. This means there must be a lot of cellulose in every plant.

3) Glucose can be stored for later use.

Starch is made from chains of glucose linked end to end. Plants store sugar molecules as starch in different places – in seeds (wheat, corn), in fruits (apples), and also in underground sites (potatoes).

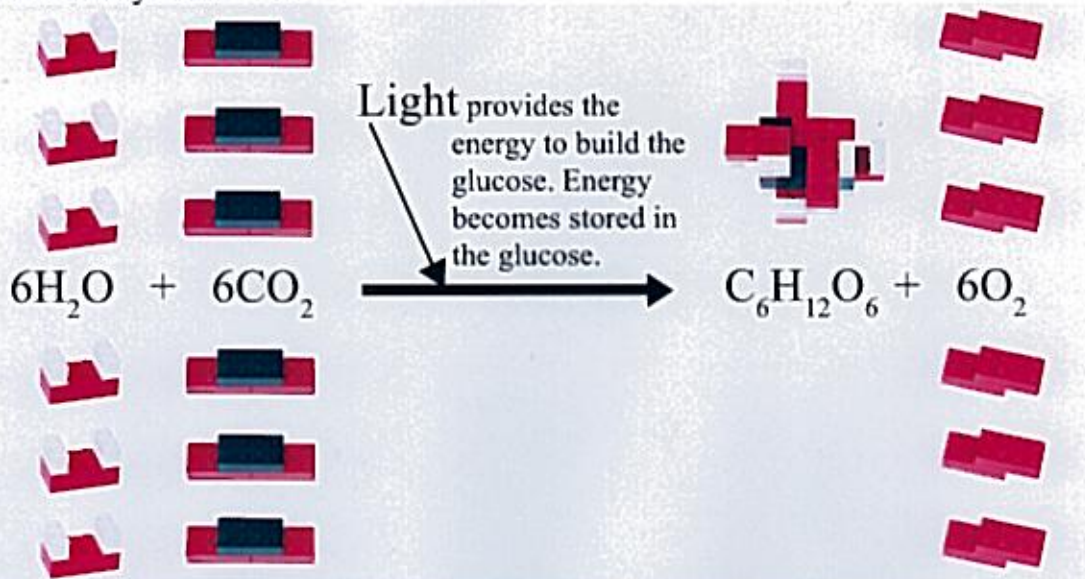
What Happens in a Plant Cell

Chloroplasts

Photosynthesis



Plants make their own food called glucose. To make glucose, plants use photosynthesis, which means “building with light.” In photosynthesis, green chlorophyll molecules inside the chloroplasts help capture the Sun’s energy. In the presence of sunlight, the **chloroplasts** can take H_2O and CO_2 molecules and build molecules of glucose. Oxygen molecules are always left over.

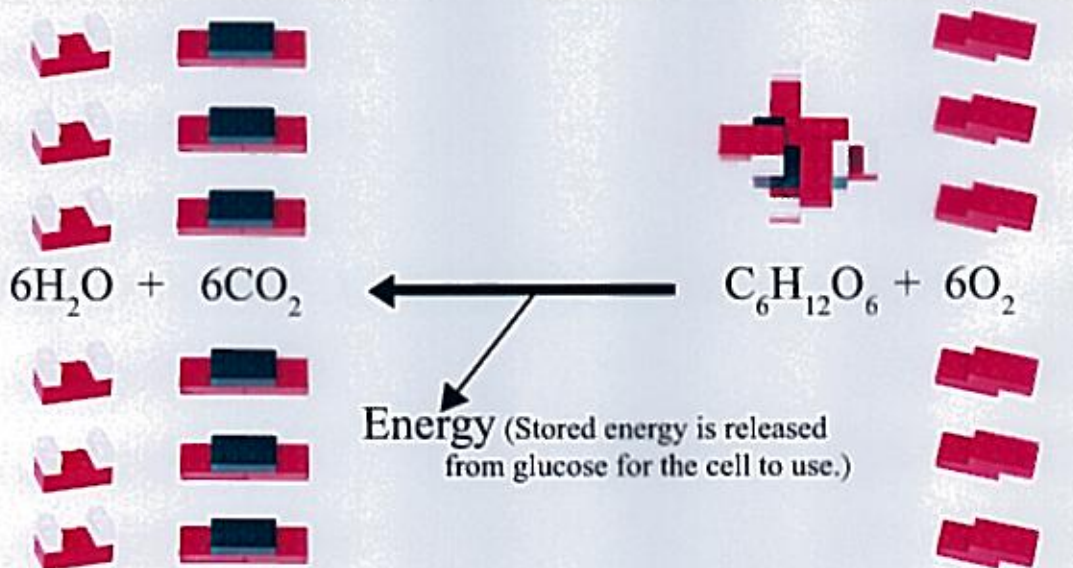


Mitochondria

Cellular Respiration



Mitochondria can get the energy out of sugar molecules for the cell. They combine oxygen and glucose molecules and produce energy. H_2O and CO_2 are given off. This process is called **cellular respiration**. Both plant and animal cells use sugar molecules (glucose) as food.



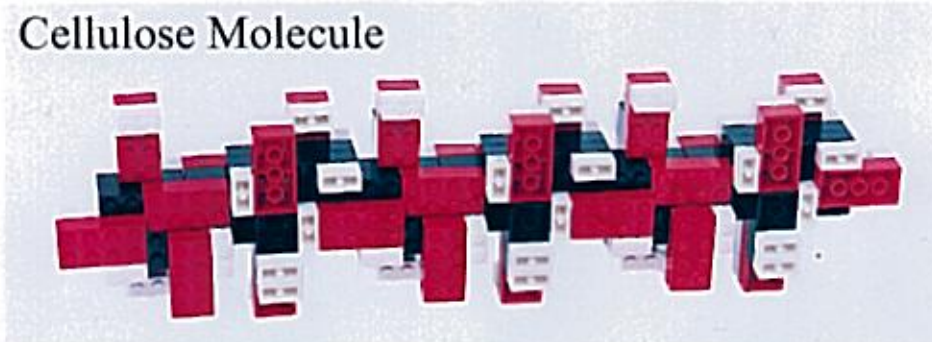
Molecules Made from Glucose

Cellulose

In **cellulose**, glucose molecules are connected in such a way that every other glucose is upside down. The chains are actually hundreds of glucose molecules long. (A chain of six is shown below.) Cellulose molecules can be found in the cell walls of plants. The glucose came from photosynthesis.

The **cell wall** is made of cellulose molecules. The cell wall is found outside of the cell membrane. Remember, animal cells do not have a cell wall and cannot make cellulose. Interestingly, animal cells cannot use cellulose molecules either! They cannot break down the cellulose to release the glucose. Some bacteria can do this step. (For example, cows are able to digest grass for food only because these bacteria help them.)

Cellulose Molecule



Starch

In starch, all glucose molecules are connected to each other in the same way. The chains are hundreds of glucose molecules long. (A chain of six is shown below.) Both plant and animal cells store the energy of glucose in these starch molecules for later use.

Starch molecules may be found in chloroplasts. If a plant cell has a lot of extra **starch** molecules, then the starch gets stored in a separate structure known as a leucoplast. You eat millions of leucoplasts when you eat potato cells. (You do like french fries, don't you?)

Starch Molecule

