

Q: How Do Plants Make Their Own Food?

A: Plants make their own food through a process called *photosynthesis*, a term that comes from the Greek language, meaning “arranging with light.” In the simplest terms, plants make their own food by absorbing the light energy of the sun and storing it in the chemical bonds of a sugar molecule. They are the only organisms capable of such a feat.

Plants make this sugar for their own use, but we and other animals take advantage of their efforts by harvesting the plants for our own food. The sun is our planet's ultimate source of energy. Humans and other animals depend on plants to transform the sun's light energy into food energy.

Not only do we use the energy-rich molecules of plants directly when we eat an orange or potato, but also indirectly when we consume animals that have consumed plants. It is often said that plants truly carry out the most important process on the planet. Now let's take a closer look at the process of photosynthesis itself.

Carbon Dioxide + Water = Sugar

The basic product of photosynthesis is a sugar called glucose. Essentially, a complex molecule called *chlorophyll* first absorbs the sun's light energy. Chlorophyll is the pigment that gives plants their green color. It is packaged in *chloroplasts* within the plant's cells. Chlorophyll

then uses the light energy to bind several carbon dioxide and water molecules, yielding glucose.

Thus the carbon, oxygen, and hydrogen of the simple, low-energy molecules of carbon dioxide and water are put together into a more complex and energy-rich glucose molecule.

The plant itself can then use the glucose for its own immediate energy needs or can convert it to the storage product of starch or other sugars such as fructose (the common sugar in fruits) and sucrose (our table sugar). We then harvest the plant and use its stored starch—in the form of potatoes, beans, or wheat—or sugars found in oranges, grapes and other fruits.

Insectivorous Plants

Some plants supplement their diets by trapping and “digesting” insects. Various plants such as Venus's flytraps, pitcher plants, and sundews incorporate different strategies to trap insects and “digest” them by producing powerful enzymes that break down the insect bodies. But, rather than being food that provides energy, the plants use the nutrient products of the digested bodies—particularly nitrogen—as fertilizer. Many insectivorous plants are found in nutrient-poor soils and have most probably evolved their insect trapping strategies as an adap-

tation to their nutrient-poor soils.

Not only do plants provide themselves and us with food energy, but one of the by-products of photosynthesis is the production and release of oxygen. In fact, plants produce practically all the oxygen in our atmosphere!



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Robert George, botanist.

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