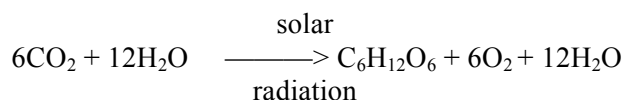


food in the form of carbohydrates. These carbohydrates, principally sugar, starches, and cellulose, provide a fundamental energy source not only for the plants themselves, but also for the animals that eat them. Animals are ultimately dependent on plant sources for their nutrition.

The byproduct of most photosynthetic processes is free oxygen, which is retained in the oceans and in the atmosphere, the latter through gravitational attraction of the Earth's mass. In effect, the Sun's energy has been used by the green plants to split the water molecule into its elements as in the process of atmospheric photolysis. The basic formula for green plant photosynthesis is:



carbon dioxide + water —> carbohydrates + oxygen + water

Today plants not only serve as the basis of the food chain for all animal life, but also they furnish the oxygen that animals breathe and use to metabolize (convert into energy) the food which the plants provide. The appearance of animals has made a unique interdependence possible.

In their respiratory processes, animals breathe in oxygen and breathe out carbon dioxide for the plants to utilize (see figure 7.4).

FIGURE 7.4

The interdependence of plants and animals. Plants convert sunlight into chemical energy through the process of photosynthesis. The byproduct is oxygen. Animals inhale oxygen and exhale carbon dioxide (respiration). All the oxygen contained in the atmosphere cycles through plants and animals about once every 3,000 years.

