

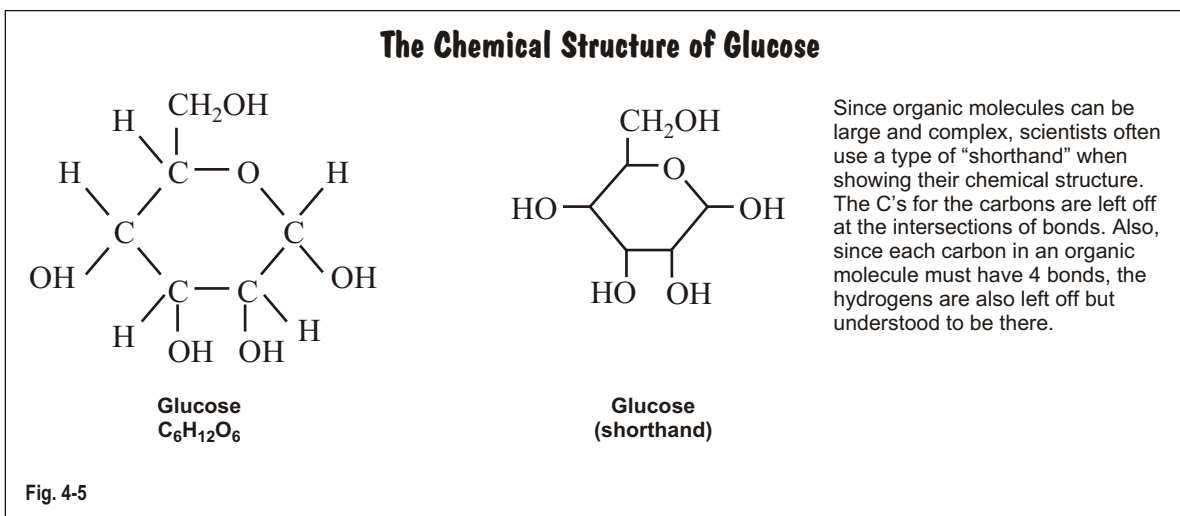
# The Components of Life

## Section 4.2 Carbohydrates



One type of macromolecule is a **carbohydrate**. Carbohydrates are made of carbon, hydrogen, and oxygen, and these atoms are usually in a ratio of 1:2:1. Carbohydrates serve two main purposes. First, they are used by living organisms as the primary source of energy. Sugars, the main component of complex carbohydrates, are broken down by cells to supply the energy a cell needs for all of the cell's activities. Secondly, they have structural purposes for plants and some animals.

The simplest carbohydrates are called **monosaccharides**, which means "simple sugar." Some examples of monosaccharides are glucose (figure 4-5), fructose (found in many fruits), and galactose (found in milk). During photosynthesis, plants produce glucose, which may be stored as starch.



The larger carbohydrates are called **polysaccharides**. The prefix "poly-" is used a lot in science, and it means "many." What do you think polysaccharide means? If you guessed that it means "many sugars," you would be correct. Polysaccharides are polymers of sugar molecules linked together with covalent bonds. Starch is a polysaccharide produced when sugar molecules form a chain (figure 4-6).

One type of polysaccharide is glycogen, a type of animal starch. Many animals use glycogen to store excess sugar, which can release energy when needed. Plants use a different polysaccharide, cellulose, in their cell walls. Whenever we eat, the carbohydrates in the food are broken down to release the stored energy that can be used immediately by the body.

