

**LAB-AIDS#505-10 CHEMISTRY OF CARBOHYDRATES KIT**  
**Student Worksheet and Guide**

Biologists nowadays depend upon chemists for much of their understanding of life and the life processes. Therefore an understanding of some chemical concepts important to living things is necessary.

Carbohydrates, fats, proteins and nucleic acids are the four major groups of organic molecules found in living organisms. Carbohydrates make up a large group of organic compounds found in cells. They are generally used for energy or cell structures.

With this lab exercise you will be expected to: (1) build on information about water in order to develop ideas about carbohydrates; (2) construct carbohydrate molecular models; (3) be able to distinguish between models and actual chemical formulas or molecules; and, (4) be able to determine the molecular characteristics of carbohydrates.

**Procedure:**

Students should work independently or in teams as directed by their instructor. It will be necessary for each student to complete his own worksheet while possibly sharing a packet of molecular parts with other students. The packet of molecular parts consist of:

14 Carbon I – tetrahedral electrons – black                      28 Hydrogen (H) – single electrons – white  
8 Oxygen (O) – double electrons – blue  
4 Nitrogen – blue

**A. Water:** The chemical formula of water is  $H_2O$ . By examining this formula, some information can be gained.

1. What elements make up water? \_\_\_\_\_
2. What does the subscript number 2 following the H represent? \_\_\_\_\_
3. Why doesn't the O have a subscript? \_\_\_\_\_
4. How many molecules of water are represented by the formula  $H_2O$ ? \_\_\_\_\_
5. What is the molecular formula of water? \_\_\_\_\_
6. Build a structural model of water with the parts provided.
  
7. Draw the structural formula for water.
  
8. What is a structural formula? \_\_\_\_\_
9. What do the lines between O and H represent? \_\_\_\_\_