MEGA MOLECULES

Name _____

Experiment 4
Chemical Changes

Things To Know:

Physical changes alter the appearance of a substance without changing its chemical composition. Examples of physical changes are freezing water, melting wax, and boiling water.

Chemical changes cause a substance to change into a different substance with a new chemical formula. Chemical changes are also known as chemical reactions. A few examples of chemical changes are food digestion, burning coal, and rusting.The five indicators of chemical change are color change, formation of a precipitate (solid), formation of a gas, odor change, and/or temperature change. Chemical changes are accompanied by changes of energy.

Figure 12

Physical Changes

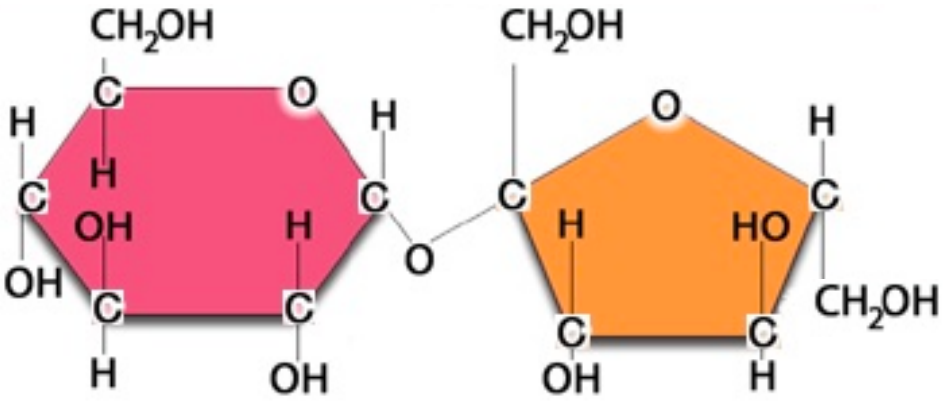
Chemical Changes

In Figure 12, you see marshmallows being toasted over a campfire. When marshmallows are toasted, a chemical change occurs. The heat causes a chemical reaction producing water molecules which evaporate, leaving the carbon behind. The sugar molecules in the marshmallow are changed into carbon.

What To Do:

1. Use the Introduction to Chemistry Model Set to build the giant sugar molecule called sucrose shown in Figure 13. Begin by building the two ring structures. Use the black (40 mm) bonds to connect carbon atoms to other carbon atoms or to oxygen atoms. Continue adding atoms to the molecule. Use the short (25 mm) gray bonds to attach the hydrogen atoms to the molecule.

Figure 13: Sugar, Sucrose



2. Many sucrose molecules are present in one big puffy marshmallow. When the marshmallow is held over a campfire a chemical change occurs. Simulate the chemical change by breaking the molecule apart and building as many water molecules as possible.

Discussion Questions for Experiment 4

1. How are chemical changes different from physical changes?
2. Is toasting a marshmallow a physical or a chemical change?
3. Describe the changes in sucrose when heat is added.
4. How many H_2O molecules were constructed from one sucrose?