



PROBLEM SOLVING ACTIVITY: SUGAR CANDY GREENHOUSE GASES

OBJECTIVE: Students will:

- + Investigate chemical models of greenhouse gases;
- + Create models of greenhouse gas molecules with candy;

MATERIALS:

- + Gummy fruit candy (multiple colors)
- + Toothpicks
- + Colored pencils/markers

PROCEDURE:

1. With the class assign each piece of candy to an atom based on color. For example, **white** = hydrogen, **green** = carbon, **red** = oxygen and **blue** = nitrogen. Adjust the colors according to the colors of the candy you are using. Have students write down your atom to color assignments to easily remember them.
2. Make a water molecule (the famous H_2O). Water molecules are made up of two hydrogen atoms that are joined to one oxygen atom inside water. So, join two hydrogen (red) pieces of candy to one oxygen (yellow) piece of candy with toothpicks. Put your molecule into your bowl. Make several more H_2O molecules and place them in the bowl.
3. Next make a carbon dioxide molecule (CO_2). Carbon dioxide molecules are made up of two oxygen atoms joined to one carbon atom. So, join two oxygen (yellow) pieces of candy to one carbon (green) piece of candy with the toothpicks. Make several more CO_2 molecules and place them in the bowl.
4. Now make a model of a molecule of nitrous oxide (N_2O). Nitrous oxide molecules are made up of two oxygen atoms joined to one nitrogen atom. So, join two oxygen pieces of candy to one piece of nitrogen candy.

Teacher Sheet 2

5. An ozone (O_3) molecule is made up of 3 oxygen molecules. Find three pieces of oxygen candy and attach them to each other.
6. Now make a molecule of methane (CH_4). Methane is made up of 4 hydrogen atoms attached to a carbon atom. Find one carbon candy and four hydrogen candies and attach them.
7. Finally, make a molecule of CFC-11, also called *Trichlorofluoromethane* (CCl_3F). It is made up of three chlorine atoms and one fluorine atom attached to a single carbon atom.
8. When you have made all of your GHG molecules, complete the chart showing the models you have made as well as the other information it asks for. Once your teacher has checked your work, you may eat your molecules!