

Name (s) : _____ , _____

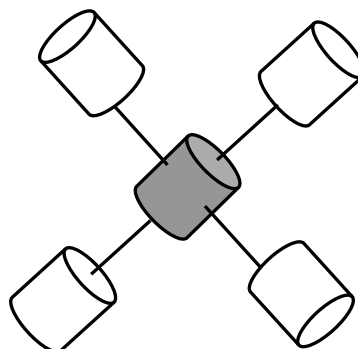
Marshmallow Bonding Activity: Covalent Bonds

Purpose: The purpose of this lab is to model covalent bonds.

You will use colored marshmallows to represent atoms of different elements and toothpicks to represent covalent bonds that form when electrons are shared. Most of the compounds that you will be making will be organic (meaning that they are made of carbon and are found in living things). Your compounds will only contain carbon, hydrogen and oxygen.

Hydrogen: WHITE
Oxygen: YELLOW
Carbon: any OTHER color

*** Please make all carbon atoms in a single molecule the same color!!!



PROCEDURES

Before making your model, you and your partner will need to write out a correct stick structure for the compound. After you have agreed that your stick structures are correct, then assemble your molecule with toothpicks and marshmallows - decide how the marshmallows need to be connected so that each atom has the right number of bonds.

So, in making your model, you will need to make sure that each atom has the right number of bonds. Before going on to the next model, have Mr. Bean check it. Once he has "Okayed" your model, draw the structural formula for each model on your lab sheet. Then go on to the next molecule and repeat your procedures. If Mr. Bean is not available to OK your model, continue to draw the dot structures of the other molecules or begin assembling the next model until he can get there.

All of the molecules will have single, double, or triple bonds in them. This does NOT mean that all of the bonds will be multiple bonds. One molecule will have a trigonal-3d shape**

Draw structural diagrams FIRST, and then assemble your models!!!

Keep these rules in mind when you are making your models:

Each carbon must have four bonds (4-toothpicks).

Each hydrogen must have one bond (1-toothpicks).

Each oxygen must have two bonds (2-toothpicks).

Molecules to be constructed:

a) O_2 b) C_3H_8 c) C_4H_{10} d) $*C_3H_6$ e) $*C_4H_8$ f) $*CH_2O$ g) $*CO_2$
h) $C_6H_{12}O_6$ i) H_2O_2 j) C_2H_6 k) $*C_2H_4$ l) $*C_2H_2$ m) $**CH_4$ n) H_2O

When you are finished with your models, you may begin to work on the questions that are on your lab sheet until Mr. Bean can check all of your models. After your models have been checked, finish drawing the structural formulas for each compound, finish the questions, and pick up your materials.

- Draw the structural formula
- Glue molecules onto a sheet of paper.
- Label the molecular formula
- Use "Google" to determine common or chemical name, i.e. H_2O_2 = hydrogen peroxide

NAME _____ PERIOD _____

QUESTIONS are to be completed individually

1. Compare and contrast ionic and covalent bonds (p116 & 119)

2. How are single, double, and triple bonds indicated by the toothpicks, i.e. how many does each have?

3. Define anion and cation (p123 & 124).

4. What does the molecular formula tell you (p128)?

5. What does the -ane, -ene, and -yne endings tell you about the molecule (p130, 132)?

6. What is an -OH ending indicate? (p132) _____

7. What is an polymer? (p133) _____

8. What is a carbohydrate? _____

9. How are proteins and amino acids related? _____

10. Describe the structure of DNA in terms of elements that compose it. _____
