

Lab Title:...*Molecular Models*..... Lab #:.....

Lab Partners:.....

Your Lab Score will be based on the following:

Neatness: All labs must be **well-written and done in pencil** unless directed otherwise. There are to be no cross-outs or misspelled words. Questions should be answered in complete sentences.

Accuracy: Certain **questions will be checked** for accuracy.

Completeness: All questions are to be answered completely. There are to be **NO BLANKS** or incomplete sections.

Lab Class Procedure: You are to **follow directions** and use lab equipment properly, work for the entire period, and follow proper clean-up procedures

Rubric:

Lab Score Category	Points Earned											
Neatness	0	1										
Accuracy	0	1	2	3	4							
Completeness	0-----3											
Lab Class Procedure	0	1	2									
<u>Total Lab Score</u>	0	1	2	3	4	5	6	7	8	9	10	

You are to submit all lab material with this lab report:

Comments:

Molecular Models Lab

Background: Organic molecules contain atoms of carbon and hydrogen bonded together. Carbohydrates, fats and proteins are the three major groups of organic compounds found in living things (biomolecules). They are composed mainly of carbon, hydrogen and oxygen. In proteins, nitrogen is also present. The skeletons of biomolecules are often chains of carbons to which hydrogen atoms are bonded. Compounds composed entirely of carbon and hydrogen are called *hydrocarbons*. Other organic molecules are formed from hydrocarbons when one or more different kinds of atoms are substituted for a carbon or a hydrogen. These groups of atoms are called *functional groups*. The chemical properties of a molecule are often determined by the functional groups present.

Organic molecules can be illustrated in many different ways. A *molecular formula* shows the types and numbers of atoms in a molecule. A *structural formula* shows the arrangement of the atoms in a molecule.

Objective: In this activity you will:

1. Study the structure of several organic molecules
2. Practice making chemical and structural formulas
3. Create 3-D models of some organic molecules

Part One: Covalent Bonds

What is a covalent bond? Identify **two** characteristics of covalent bonds.

Not all atoms make the same number of covalent bonds. It has to do with the number of electrons the atom has around its nucleus. You will learn about the "octet rule" in chemistry so at this point we can simply count the number of holes in each type of atom in the model kit. Each element in the kit has a different color. Use the colors to fill out the table below:

Element	Symbol	Color	Number of covalent bonds
Carbon		Black	
Hydrogen		White (or green in some kits)	
Oxygen		Red	
Nitrogen		Blue (or orange in some kits)	Only makes 3 (there are 4 holes)

Part Two: Models and formulae:

For each molecule, determine the chemical formula and try to make the model of the molecule using the kits. In order for a molecule to be stable, each hole must have a bond piece and each end of a bond piece must be in an atom. Have a teacher check your model and when it's been okayed, draw the chemical formula. Indicate if the molecule is organic or inorganic and record three more facts about the molecule (other than what it's made of)

Molecule
WATER

Chemical Formula

Structural Formula

Facts:

- 1.
- 2.
- 3.

Organic or inorganic?

OXYGEN

(the molecule not the atom!)

Facts:

- 1.
- 2.
- 3.

Organic or inorganic?

CARBON DIOXIDE

Facts:

- 1.
- 2.
- 3.

Organic or inorganic?

METHANE

Facts:

- 1.
- 2.
- 3.

Organic or inorganic?

Initials

Molecule

Chemical Formula

Structural Formula

ETHYL ALCOHOL

(Ethanol)

Facts:

1.

2.

3.

Organic or inorganic?

GLYCINE

Facts:

1.

2.

3.

Organic or inorganic?

GLYCEROL

Facts:

1.

2.

3.

Organic or inorganic?

GLUCOSE

Ring structure

Facts:

1.

2.

3.

Organic or inorganic?

Initials
