MEGA MOLECULES

Name _____

Experiment 5
Balancing Chemical Reactions

Things To Know:

The Law of Conservation of Mass states that matter cannot be created or destroyed during a chemical reaction. The beginning materials are call reactants. During a chemical reaction the atoms in the reactants are merely rearranged into different materials called products. A chemical equation is a symbolic representation of a chemical reaction in the form of symbols and formulas. When the number of each type of atom is equal on the two sides of the equation, the equation is balanced.

Figure 14: Chemical Reaction

natural gas (methane)+ oxygen gas → carbon dioxide gas + water

reactants products

Balanced Chemical Equation

$$CH_4 + \underline{2}O_2 \rightarrow CO_2 + \underline{2}H_2O$$

reactants

1 carbon atom
4 hydrogen atoms
4 oxygen atoms

products

1 carbon atom
4 hydrogen atoms
4 oxygen atoms

What To Do:

1. Build one propane molecule, C_3H_8, and five oxygen molecules, O_2. Use the black (40 mm) bonds to connect carbon atoms to other

carbon atoms. Use the short (25 mm) gray bonds to attach the hydrogen atoms to the molecule.

2. Count the number of each type of atom in the reactants and record the numbers in Activity Table 5.
3. **Using only the atoms in the reactants**, rearrange the atoms to build as many carbon dioxide, CO_2, and water, H_2O, molecules as possible. (Note: the number and types of bonds may change.) Write the number of carbon dioxide and water molecules in the blanks below.

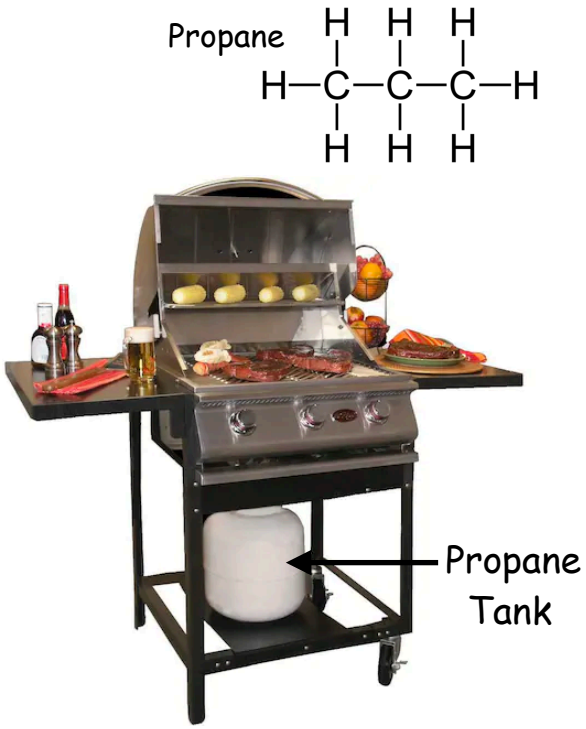

Figure 15: Propane

1 C_3H_8 + 5 O_2 → _____ CO_2 + _____ H_2O

reactants **products**

4. Count and record in Activity Table 5 the number of each type of atom in the products.

Activity Table 5: Balanced Chemical Equation

Atoms	Number of Atoms in Reactants	Number of Atoms in Products
Black carbon		
White hydrogen		
Red oxygen		

Discussion Questions for Experiment 5

1. What is the law of Conservation of Mass?
2. Balance the equation: ___ C_4H_8 + ___ O_2 → ___ CO_2 + ___ H_2O
3. Explain how atoms are conserved during a chemical reaction?