Name: _____ Period: _____

Balancing the Rainbow

Objective: Students will learn how to balance chemical equations.

Materials:

- Cup of Skittles
- 3 pieces of scratch paper
- Lab handout

Directions:

1. Take one piece of your scratch paper and write reactants at the top, take another and write products at the top and take the third and draw an arrow in the center.
2. Pick a color of skittle to represent atoms of the elements that are in your chemical equation. Write the colors in the blank.
3. Using the different skittles colors that you designated for each element, make the reactants out of skittles on the piece of paper that says reactants. (You must put the skittles together in the same ratio as the molecules)
4. Using the same skittles colors you chose for the different elements, make the products out of skittles on the piece of paper labeled products. (You must put the skittles together in the same ratio as the molecules)
5. Count up the number of colored skittles you have on each side.
6. Add more compounds on either side to get the skittles in your reactants equal to the skittles in your products. The skittles MUST be in the same ratio as the compounds, you cannot just add 1 skittle unless that is what the formula states.
7. Add up the number of molecules you have of each and write it in the blanks in front of the corresponding molecules in the equation.

Chemical equations:

1. $N_2 + H_2 \rightarrow NH_3$

   Skittles Color:

   N = _____

   H = _____

   Balanced Equation:

   _____N_2 + _____H_2 → _____NH_3

2. $H_2O \rightarrow H_2 + O_2$

   Skittles Color:

   H = _____

   O = _____

   Balanced Equation:

   _____H_2O → _____H_2 + _____O_2

3. $CH_4 + O_2 \rightarrow CO_2 + H_2O$

   Skittles Color:

   C = _____

   H = _____

   O = _____

   Balanced Equation:

   _____CH_4 + _____O_2 → _____CO_2 + _____H_2O

4. $CH_2O + H_2 \rightarrow CH_3OH$

   Skittles Color:

   C = _____

   H = _____

   O = _____

   Balanced Equation:

   _____CH_2O + _____H_2 → _____CH_3OH

Post-Lab:

1. Use your textbook to look up the Law of Conservation of Mass. Write the definition below.

2. How did this activity with skittles reflect the Law of Conservation of Mass? Explain.

3. The only numbers that we can change while balancing a chemical equation are the coefficients. These are the numbers that are put in front of the molecules in the chemical formula. The subscripts of the molecules can NEVER change. Those must stay the same to maintain the correct identity of the molecule. In the chemical equation below, put a box around the coefficients and circle the subscripts.

$$P_4 + 6F_2 \rightarrow 4PF_3$$

4. Balance the equations below:

a. _____$CaCO_3$ → _____CaO + _____CO_2

b. _____ZnS + _____O_2 → _____ZnO + _____SO_2

c. _____KrF_2 + _____H_2O → _____Kr + _____O_2 + _____HF

d. _____Fe + _____$FeCl_3$ → _____$FeCl_2$

e. _____$Ba(OH)_2$ + _____$AlCl_3$ → _____$Al(OH)_3$ + _____$BaCl_2$

f. _____C_6H_6 + _____O_2 → _____CO_2 + _____H_2O