

## Gummy Bear Equations

### Purpose:

Balancing can be a difficult skill to master. Visual aids can be helpful when working to learn a new skill that involves manipulating items that are not easily visualized.

### Materials Needed:

Reaction Grid

15 toothpicks

4 different colors of Gummy Bears (16,12,8,& 4 of the respective colors)

### Procedure:

Balance the equations on your lab sheet by doing the following:

1. Write down a color of gummy bear to represent an atom of each element in the equation. Use the color that you have the most of to represent oxygen.
2. Create the molecules in the equation using a toothpick and the jelly beans for each element in the compound.  
\*Be sure to put the correct number of atoms of each element on the toothpick! For example:  $\text{Ca}(\text{OH})_2$  equals 1 Ca, 2 O's, and 2 H's.
3. Place each molecule in the correct box on the "Reaction Grid." **You may not have to use all four boxes on the grid!** Once you have the original equation on the grid, you can only add more molecules like you have with the original. Adding single gummy bears, or taking them away, is the same as changing a subscript, and you **CANNOT** change a subscript.
4. Balance each equation by adding additional molecules until all types of atoms are equal. For example: #of orange reactants equals # of orange products, etc.
5. Write down the balanced equation in the space provided. The number of molecules in each box (number of toothpicks of each molecule) is equal to the coefficient for that compound or element.
6. Include the balanced equations in your lab report.
7. For half (5 of 10) write out the description of the reaction in words (sentence format). Indicate which number you are describing, just in case there are errors that could cause confusion as to which one you were describing. These descriptions should be in with the rest of your data in the report.

### Questions:

1. Why can you not balance an equation by changing the subscripts on the chemical formulas?
2. What would you do if the coefficients for a balanced reaction were 2,4, 2 and 6, in order to show the most correct balanced equation?
3. Did you find this lab to be helpful in learning how to balance a chemical equation?
4. Explain in a few (2-3) sentences how this lab was helpful, or how you would change the lab to make it more helpful in learning to balance equations.

## EQUATIONS:

1.  $\text{Al} + \text{O}_2 \rightarrow \text{Al}_2\text{O}_3$     Balanced Equation: \_\_\_\_\_

Al: \_\_\_\_\_

O: \_\_\_\_\_

2.  $\text{HgO} \rightarrow \text{Hg} + \text{O}_2$     Balanced Equation: \_\_\_\_\_

Hg: \_\_\_\_\_

O: \_\_\_\_\_

3.  $\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{H}_2\text{O}$     \_\_\_\_\_

Na: \_\_\_\_\_

H: \_\_\_\_\_

O: \_\_\_\_\_

S: \_\_\_\_\_

4.  $\text{Fe} + \text{O}_2 \rightarrow \text{Fe}_2\text{O}_3$     \_\_\_\_\_

Fe: \_\_\_\_\_

O: \_\_\_\_\_

5.  $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$     \_\_\_\_\_

H: \_\_\_\_\_

O: \_\_\_\_\_

6.  $\text{Fe} + \text{CuCl}_2 \rightarrow \text{FeCl}_2 + \text{Cu}$     \_\_\_\_\_

Fe: \_\_\_\_\_

Cu: \_\_\_\_\_

Cl: \_\_\_\_\_

7.  $\text{Mg} + \text{HCl} \rightarrow \text{H}_2 + \text{MgCl}_2$     \_\_\_\_\_

Mg: \_\_\_\_\_

H: \_\_\_\_\_

Cl: \_\_\_\_\_

8.  $\text{H}_2\text{O} + \text{Fe} \rightarrow \text{Fe}_2\text{O}_3 + \text{H}_2$     \_\_\_\_\_

H: \_\_\_\_\_

O: \_\_\_\_\_

Fe: \_\_\_\_\_

9.  $\text{HgO} + \text{Cl}_2 \rightarrow \text{HgCl} + \text{O}_2$     \_\_\_\_\_

Hg: \_\_\_\_\_

O: \_\_\_\_\_

Cl: \_\_\_\_\_

10.  $\text{Ca}(\text{OH})_2 + \text{HNO}_3 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{H}_2\text{O}$     \_\_\_\_\_

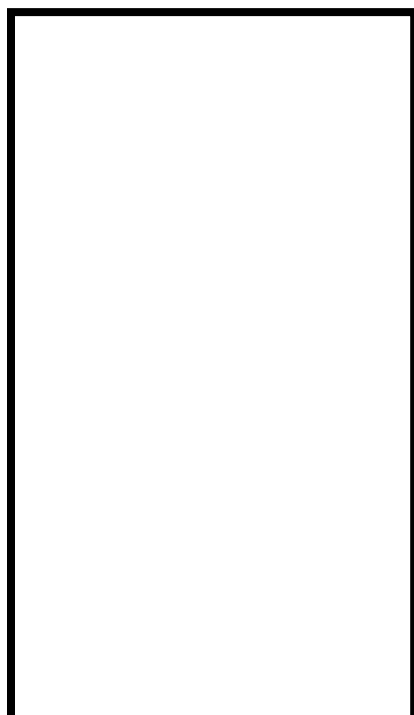
Ca: \_\_\_\_\_

H: \_\_\_\_\_

O: \_\_\_\_\_

N: \_\_\_\_\_

## REACTION GRID



+

