Name________________ Block_____ Science 10

JELLYBEAN BALANCING

In this activity, you will learn to balance chemical reactions by using candy to represent the atoms involved in a chemical reaction. You may not eat your candy until instructed to do so!

Getting Started

WASH/SANITIZE YOUR HANDS BEFORE OBTAINING THE CANDY! Working with your partner, obtain the proper number of each colour candy. The chart below will serve as a reference for constructing the equations.

ATOM	**O**	**H**	**Na**	**Cl**	**K**	**Ca**
Jellybean Colour	**Pink OR Red**	**Yellow**	**Purple**	**Green**	**Orange**	**White**
Number	**20**	**10**	**6**	**8**	**6**	**2**

Understanding Balanced Chemical Equations

When chemicals react, atoms are conserved. That means that there must be the same number of each atom on each side of the arrow.

Look at the reaction! $\mathbf{H_2 + O_2 \rightarrow H_2O}$

Try to represent this reaction below by using your candy (put Jellybeans in the boxes).

H_2	+	O_2	→	H_2O
	+		→	

Now answer the following questions while viewing the boxes above.

How many hydrogen candies are on the *left* side of the arrow? ______________

How many oxygen candies are on the *left* side of the arrow?! _____________

How many hydrogen candies are on the *right* side of the arrow?_____________

How many oxygen candies are on the *right* side of the arrow?! ______________

Is the equation, as it was originally written, a balanced equation?_____________

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Now you will **"ADJUST"** the equation so that **IT IS BALANCED**. Some key ideas to remember...

- ☑ You may not change the chemical formula for any item.
  - **H_2 MUST STAY H_2**
  - **O_2 MUST STAY O_2**
  - **H_2O MUST STAY H_2O**

- ☑ You may use more candy to make more **whole molecules** of any individual product or reactant.
  - **H_2 is a "whole molecule"...so you can make more H_2's**
  - **O_2 is a "whole molecule"...so you can make more O_2's**
  - **H_2O is a "whole molecule"...so you can make more H_2O's**

- ☑ You may not add individual atoms (pieces of candy) to either side.
  - **H_2 is a "whole molecule"...so you can ADD more H_2's**
  - **O_2 is a "whole molecule"...so you can ADD more O_2's**
  - **H_2O is a "whole molecule"...so you can ADD more H_2O's**

Now try adding "WHOLE MOLECULES" to make the equation balanced.

H_2	+	O_2	→	H_2O
	+		→	

Now count the number of **EACH TYPE OF WHOLE MOLECULE**.

How many H_2's do you have? __________

How many O_2's do you have? __________

How many H_2O's do you have? __________

*****These are your NEW COEFFICIENTS of the equation. Fill them in the spaces below.**

_____H_2 + _____O_2 → _____H_2O

Now answer the following questions.

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How many hydrogen candies are on the *left* side of the arrow? ______________

How many oxygen candies are on the *left* side of the arrow? _____________

How many hydrogen candies are on the *right* side of the arrow? _____________

How many oxygen candies are on the *right* side of the arrow? ______________

Is the equation a balanced equation? _____________

Now you will do the same thing with the following equations. Check with your teacher when done.

Put the initial compounds in the boxes BEFORE adding whole molecules!!!

REACTION 2: Sodium Chloride plus Calcium Oxide produces Sodium Oxide plus Calcium Chloride

NaCl	**+**	**CaO**	**→**	**Na_2O**	**+**	**$CaCl_2$**
	+		**→**		**+**	

_____NaCl + ______CaO → ______Na_2O + ______$CaCl_2$

REACTION 3: Potassium Chlorate yields Potassium Chloride plus Oxygen

$KClO_3$	**→**	**KCl**	**+**	**O_2**
	→		**+**	

______$KClO_3$ → ______KCl + ______O_2

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REACTION 4: Potassium Hydroxide plus Sodium produces Sodium Hydroxide plus Potassium

KOH	+	Na	→	NaOH	+	K
	+		→		+	

______KOH + ______Na → ______NaOH + ______K

CHECK WITH YOUR TEACHER NOW...IF CORRECT YOU CAN EAT!!!

Post Lab Question

1.) Why do you see OXYGEN as O_2 and Hydrogen as H_2? (look at your notes as we have discussed this)