



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Group: \_\_\_\_\_

# STUDENT JOURNAL

## Chemical Formulas and Equations

### Part I: The Big Picture

1. What are the starting substances (molecules) in a chemical equation called?

reactants

2. What are the final or new substances (molecules) in a chemical equation called?

products

3. In your own words, describe what happens to the hydrogen and oxygen molecules when forming water. Something must be re-combined. How does this happen?











The atoms in hydrogen and oxygen molecules are held together. In order for water to be produced, the atoms of the reactants must be pulled apart so the atoms are free to recombine and form the product.

### Part II: Chemical Formulas

Chemical Formula	Elements and Number of Atoms	Model
1. $ZnCl_2$	Zinc 1 Chlorine 2	
2. $MgCO_3$	Magnesium 1 Carbon 1 Oxygen 3	
3. $CuCl_2$	Copper 1 Chlorine 2	
4. $NaHCO_3$	Sodium 1 Hydrogen 1 Carbon 1 Oxygen 3	
5. $CO_2$	Carbon 1 Oxygen 2	

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## Part III: Chemical Equations



1. $H_2CO_3 \rightarrow H_2O + CO_2$	
Reactants Hydrogen 2 Carbon 1 Oxygen 3	Products Hydrogen 2 Oxygen 3 Carbon 1
Model of Reactants 	Model of Products 
2. $2Cu + O_2 \rightarrow 2CuO$	
Reactants Copper 2 Oxygen 2	Products Copper 2 Oxygen 2
Model of Reactants 	Model of Products 
3. $2Na + 2HCl \rightarrow H_2 + 2NaCl$	
Reactants Sodium 2 Hydrogen 2 Chlorine 2	Products Hydrogen 2 Sodium 2 Chlorine 2
Model of Reactants 	Model of Products 
4. $Cl_2 + 2KI \rightarrow 2KCl + I_2$	
Reactants Chlorine 2 Potassium 2 Iodine 2	Products Potassium 2 Chlorine 2 Iodine 2
Model of Reactants 	Model of Products 
5. $Mg + 2HCl \rightarrow MgCl_2 + H_2$	
Reactants Magnesium 1 Hydrogen 2 Chlorine 2	Products Magnesium 1 Chlorine 2 Hydrogen 2
Model of Reactants 	Model of Products 

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## Part III: Chemical Equations, continued

6. What happens to reactant molecules when forming product molecules?  
*The atoms of the reactant molecules are pulled apart by energy. The atoms rearrange and make new substances.*
7. What do the coefficients located before certain molecules in each chemical equation represent?  
*The coefficients represent the number of each type of molecule found in each chemical equation.*
8. What do you notice about the elements on the reactant and product side of the equation?  
*The same elements are found in the reactants and the products; they are still present. NO new elements have been added!*
9. What do you notice about the number of atoms of each element on the reactant and product side of the equation?  
*Each element has the same number of atoms on the reactant and product side of the equation.*

## Part IV: The Balancing Act

$Zn + HCl \rightarrow ZnCl_2 + H_2$	
Reactants Zinc 1    Chlorine 1 Hydrogen 1	Products Zinc 1    Hydrogen 2    Chlorine 2
Model of Reactants 	Model of Products 

\* NOT BALANCED

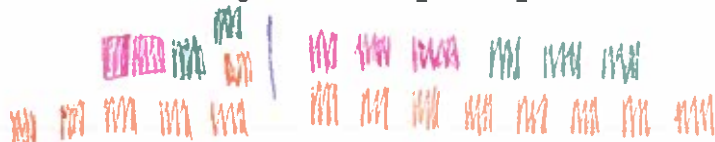
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## Part IV: The Balancing Act, continued

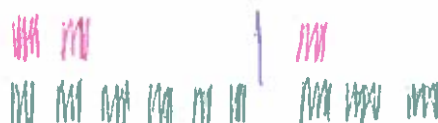
Look at the chemical equations below. Determine which of these equations is balanced and which is not. First identify the type and number of atoms found on the reactant and product side of the equation. Then, circle whether the equation is **Balanced** or **Not Balanced** and then answer the questions on the next page.



Balanced  Not Balanced



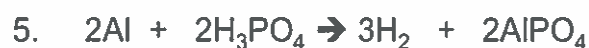
Balanced  Not Balanced



Balanced  Not Balanced



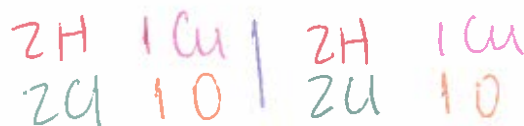
Balanced Not Balanced



Balanced Not Balanced



Balanced  Not Balanced



Balanced Not Balanced

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## Reflections and Conclusions

1. In your own words, explain what the Law of Conservation Mass tells us.

The Law of Conservation of Mass tells us that the mass of the reactants must equal the mass of the products. Nothing is created or destroyed.

2. Why is the Law of Conservation Mass important to understand when writing chemical formulas and chemical equations?

It is important to understand because the atoms of each element on the reactant side must equal the atoms of each element on the product side.

3. Use the chemical equation below and all of the information learned in this Explore Activity to answer the questions below.



4. Write down the chemical formulas of the reactants. State how many atoms of each element are on the reactant side.

The chemical formulas of the reactants are CuO and HCl. There is one atom of Cu, one atom of O, two atoms of H, two atoms of Cl.

5. Write down the chemical formulas of the products. State how many atoms of each element are on the product side.

The chemical formulas of the products are CuCl<sub>2</sub> and H<sub>2</sub>O. There is one atom of Cu, two atoms of Cl, two atoms of H, one atom of O.

6. How does the number of atoms present on each equation side relate to the Law of Conservation Mass?

The number of each type of atom on the reactant side equals the number of each type of atom on the product side. The mass of the reactants equals the mass of the products, which follows the Law of Conservation of Mass.

