

Name: _____

Date: _____ Core: _____

It's a balancing act

When you put pure sodium (Na) into water it creates a huge explosion, if ingested by a human pure chlorine (Cl) is likely fatal, but when you combine these two elements you can put it on your baked potato. Sodium Chloride, or NaCl is also known as table salt! Different elements bond to make the millions of compounds that make up our world. So what has to happen to make up those elements and compounds? Once they're formed how do they change?

Do you remember the Law of Conservation of Matter? It states that matter cannot be created or destroyed, which means that in a chemical reaction no atoms can be created or destroyed. During a reaction atoms are simply **rearranged**. When matter is rearranged we call that a **chemical change** and the process of atoms being rearranged is called a **chemical reaction**. Then we write **chemical equations** to show how matter was rearranged during the chemical reaction. The **reactants** on the left side of the equation have to have the same number of atoms as the **products** on the right.

Part 1: Using your periodic table and notes, identify the **elements** in each compound based on its formula and categorize them as either "metals" or "nonmetals". Then determine the type of bond for each compound, the first two have been done for you.

Chemical Formula	Metals	Non-Metals	Type of Bond
HF		hydrogen fluorine	covalent
NaCl	sodium	chlorine	ionic
C ₄ H ₁₀			
Al ₂ O ₃			
CBr ₄			
Na ₂ S			
Sr ₃ N ₂			

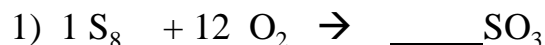
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Part 2: For the following chemical formulae use the **subscript** (small number at the bottom) to identify the number of each type of atom present in the compound, the first one has been done for you.

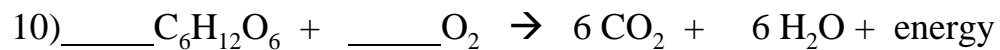
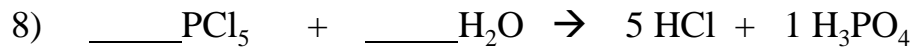
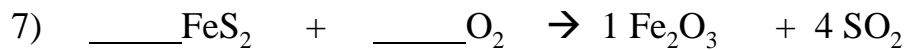
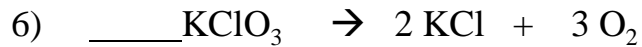
Chemical Formula	Name and # of Atom 1	Name and # of Atom 2	Name and # of Atom 3 (if present)
HF	Hydrogen- 1	Fluorine- 1	Not present
NaCl			
C ₄ H ₁₀			
Al ₂ O ₃			
CBr ₄			
Na ₂ S			
Sr ₃ N ₂			

Part 3: Use the beads to represent atoms as you try to balance the equations below. Use different colored beads to represent the different atoms that make up elements and compounds. Place the beads on your paper plates marked reactants and products and arrange them into element or compound groups. Then complete the calculations to balance the products and reactants. ****Remember: the subscript numbers (2) show how many of each atom are present in a compound or element**** For #1-5 the reactants are balanced for you, for #6-10 the products are balanced for you



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Summary:

1. What does the **subscript** number mean in a chemical formula? What does the coefficient indicate in a chemical equation?

2. What is the Law of Conservation of Matter?

3. Why is the Law of Conservation of Matter important for balancing equations?

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Analysis:

1. When a scientist reacts two or more compounds sometimes it forms a **precipitate**. A **precipitate** is a solid substance that forms after a chemical reaction. When you dissolve both magnesium sulfate (Epsom salt) and sodium carbonate in water you get two clear liquids. When you mix these two clear liquids a **precipitate** forms, which means after mixing two liquids you see a solid. According to the Law of Conservation of Matter does this solid contain different atoms than the two liquids?