Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Pd: \_\_\_\_\_ Ast: \_\_\_\_\_

**Chemical Reactions Study Guide**

1. **Chemical Bonds**
   1. What is formed when atoms bond together?

***compounds***

* 1. How are valence electrons involved (mention the octet rule)?

***Atoms bond so that they have a full outer shell of valence electrons. This satisfies the octet rule, giving them 8 valence electrons (with some exceptions where they are full with only 2).***

* 1. Explain the key difference between an ionic bond and a covalent bond.

***The key difference between ionic and covalent bonds is what holds the atoms together. Ionic bonds are held together by opposing charges, with a positive ion attracting a negative ion. Covalent bonds are held together by sharing a pair of valence electrons.***

1. **Chemical Reactions**
2. Explain what a chemical reaction is.

***A process that transforms one set of chemical substances into another by breaking existing bonds and forming new ones.***

1. Identify evidence that a chemical reaction has occurred.

***A CHANGE IN PROPERTIES such as the production of gas or color change or a CHANGE IN ENERGY such as heat or light given off.***

1. Describe a chemical reaction you have observed in this class and provide evidence that it was a chemical reaction.

***Chemical Reactions Lab – The combination of calcium chloride, baking soda, and phenol red solution causes a chemical reaction. Evidence of this was the production of a new substance (gas), a color change, and heat given off.***

***Controlling Reactions Lab – The combination of Alka-Seltzer and water produces a chemical reaction. Evidence is the gas produced.***

1. Describe the role of “reactants” and “products” during a chemical reaction.

***Reactants are the chemicals present before the reaction, while products refer to the chemicals present after the reaction.***

1. **Law of Conservation of Mass**
2. How do the reactants compare to the products in a chemical reaction?

***The reactants and the products are the same atoms (same elements) combined in a different way. No matter is added or removed during the reaction.***

1. What does the law of conservation of mass state?

***The mass of the products will be equal to the mass of the reactants. Matter is neither created nor destroyed; the same atoms that are present before the reaction are there after the reaction.***

1. How does a chemical equation show that mass is conserved during a chemical reaction?

***The number of atoms of each element must be the same on both sides of the equation, showing that no matter has been added or removed.***

1. **Controlling Chemical Reactions**
2. How can chemists use temperature to control the rate of a chemical reaction?

***Increasing the temperature will speed up the reaction, while decreasing the temperature will slow down the reaction.***

1. Why does this occur?

***Increasing the temperature causes the particles to speed up and collide more frequently, speeding up the reaction. Decreasing temperature has the opposite effect, slowing the particles down causing them to collide less frequently, slowing down the reaction.***