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

**Physical Science Honors:**

**Chemical Reactions Study Guide**

1. What is a chemical reaction?
2. List at least three signs that a chemical reaction has occurred.
3. Give an example from class where you observed a chemical reaction and how you knew it was a chemical reaction.
4. You place a cube of sugar in warm tea and watch it dissolve as you stir the water. Next, you place a tablet of Alka-Seltzer in warm water and observe a lot of fizz (bubbles) as it dissolves. Compare these two processes. How would you classify them? Why?
5. What do you call the chemicals that are present before a reaction? What do you call the chemicals that are present after a reaction?
6. If you were to compare the **elements** present before a chemical reaction with those present after the reaction, what would you find?
7. If you were to compare the **atoms** present before a chemical reaction with those present after the reaction, what would you find?
8. Explain why it is important that the number of atoms for each element is the same on both sides of the equation.
9. What is the difference between an endothermic chemical reaction and an exothermic chemical reaction?
10. Illustrate at least two different ways to express that there are 6 sodium (Na) atoms in a chemical formula (write a chemical formula using coefficients and subscripts).
11. Indicate whether the following chemical reactions are balanced by writing “YES” or “NO” on the line.
    1. 2Fe + 3Cl2 🡪 2FeCl3 \_\_\_\_\_\_\_\_\_\_
    2. CO2 + NaOH 🡪 NaHCO3 \_\_\_\_\_\_\_\_\_\_
    3. 2HNO3 🡪 N2O5 + H2O \_\_\_\_\_\_\_\_\_\_
    4. PCl3 + 3H2O 🡪 H3PO3 + 3HCl \_\_\_\_\_\_\_\_\_\_
    5. C4H10O + 6O2 🡪 4CO2 + 5H2O \_\_\_\_\_\_\_\_\_\_
12. Balance the following chemical reactions by placing the correct coefficient (number) on the line.
    1. 2Fe + 3Cl2 🡪 \_\_\_\_\_FeCl3
    2. \_\_\_\_\_Ag2CO3 🡪 4Ag + 2CO2 + O2
    3. 4Fe + 3O2 🡪 \_\_\_\_\_Fe2O3
    4. Zn + \_\_\_\_\_HCl 🡪 ZnCl2 + H2
    5. 2KClO3 🡪 2KCl + \_\_\_\_\_O2
13. From the chemical reactions listed above in #11 and #12, provide an example of:
    1. A synthesis reaction:
    2. A decomposition reaction:
    3. A replacement reaction:
14. What is the difference between an endothermic and an exothermic reaction?
15. What happens to a chemical reaction when you increase the temperature of the reactants? Explain why.
16. What happens to a chemical reaction when you increase the concentration of reactants? Explain why.
17. What happens to a chemical reaction when you increase the surface area of the reactants? Explain why.
18. Explain the role of catalysts and inhibitors in chemical reactions.