**2.3: Changes in Matter**

**Worksheet**

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Class \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

*Answer each of the questions below to show your achievement of the lesson objectives.*

**Lesson Objective: Identify the chemical properties of a substance.**

1. Chemical properties can only be observed
   1. in the dark
   2. as the substance is being changed
   3. before materials are mixed together
   4. when materials are frozen
2. A chemical property describes
   1. the behavior of material when heated
   2. the color of the product
   3. the ability of a substance to undergo chemical change
   4. the amount of material used
3. True or False: A chemical property is the same as a physical property.
4. True or False: Change is necessary in order to identify a chemical property.
5. True or False: Rust formation is not a chemical property of iron.

**Lesson Objective: Describe chemical changes and differentiate them from physical changes.**

1. In a physical change
   1. a new material is created
   2. the color will change
   3. the composition of the material is altered
   4. the identity of the substance does not change
2. One of the following terms is not used to describe a chemical change
   1. transmutation
   2. fermentation
   3. decomposition
   4. combination
3. Which of the following terms is used to describe a material on the left-hand side of the arrow in a chemical reaction?
   1. product
   2. reagent
   3. resultant
   4. reactant
4. Rusting is an example of what kind of change?
   1. chemical
   2. physical
   3. decomposition
   4. biological
5. True or False: Chemical reactions are usually written left to right.
6. True or False: The product is a starting material in a chemical reaction.
7. True or False: The rusting of iron is a chemical reaction between tin and iron.
8. True or False: Zinc does not react with sulfur at room temperature.
9. One or more \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ must be formed if a chemical reaction has taken place.
10. What is the product of the reaction between zinc and sulfur? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
11. Write the chemical formula for the above product \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
12. Read the passage below and answer the following questions:
13. The reaction between zinc and sulfur can be depicted in something called a chemical equation. In words, we could write the reaction as: zinc + sulfur → zinc sulfide A more convenient way to express a chemical reaction is to use the symbols and formulas of the substances involved: Zn + S → ZnS The substance(s) to the left of the arrow in a chemical equation are called reactants. A reactant is a substance that is present at the start of a chemical reaction. The substance(s) to the right of the arrow are called products. A product is a substance that is present at the end of a chemical reaction. In the equation above, zinc and sulfur are the reactants that chemically combine to form zinc sulfide as a product.
    1. How do we recognize a reactant in a chemical equation?
    2. How do we recognize a product in a chemical reaction?
    3. What does the arrow stand for?
    4. What is an advantage of using chemical symbols?

**Lesson Objective: Use various visual clues to identify whether a chemical reaction is taking place.**

1. When heated, mercuric oxide produces
   1. mercuric nitride
   2. oxynitride
   3. oxygen
   4. nitrogen oxides
2. The reaction of zinc with hydrochloric acid produces
   1. hydrogen
   2. chlorine
   3. oxygen
   4. nitrogen
3. The reaction of zinc and hydrochloric acid produces
   1. a cold test tube
   2. a yellow color
   3. a warm test tube
   4. a bad smell
4. The best way to know that a chemical reaction has taken place is to
   1. look at the shape of the materials
   2. see if the color has changed
   3. test the composition of the material after change has taken place
   4. look at the equation that was written before the reaction was run.
5. True or False: All chemical changes involve a transfer of energy.
6. True or False: A precipitate is not a sign that a chemical reaction has occurred.
7. True or False: When a gas condenses, it releases energy.
8. The metal formed in the decomposition of mercuric oxide is \_\_\_\_\_\_\_\_.
9. Lead iodide produces a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ when it is formed from solutions of lead nitrate and potassium iodide.
10. The process of heated magnesium reacting with oxygen is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
11. Many reactions display a change in \_\_\_\_\_\_\_\_\_\_ to show that a reaction has occurred.
12. Lead iodide produces a \_\_\_\_\_\_\_ color when lead nitrate and potassium iodide are mixed.
13. \_\_\_\_\_\_\_\_\_\_\_\_ gas would be expected to be released during the reaction of hydrochloric acid with iron since this metal behaves the same way zinc does.
14. One visible form of energy transfer in a chemical reaction is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
15. What is the product of the reaction between magnesium and oxygen ? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
16. You have two bottles of colorless solutions that could be potassium iodide (bottle one), and hydrochloric acid (bottle two). Unfortunately, the labels cannot be read. How would you clearly demonstrate the identity of both bottles? You can make use of any other chemicals you need for the testing.