Name _____

Topic 2 - Lesson 3: "Modeling Chemical Reactions"

Guiding Questions: Use pgs. 90-97

- How can a model be used to identify the components of a chemical reaction?
- How can a chemical reaction be used to model the conservation of mass?

1. What is a chemical equation?

   _____

2. What 3 things does a chemical equation convey?
   a. _____
   b. _____
   c. _____
3. If there is no number behind the element in the formula, how many atoms of that element are there?

   _____
4. What is a subscript?

   _____
5. What does the arrow mean in a chemical equation?

   _____
6. What is a coefficient?

   _____
7. Use Figure 2 on Page 92: The following chemical equation represent the formation of ammonia from nitrogen and hydrogen gas.

   $N_2 + 3H_2 \rightarrow 2\,NH_3$

   a. Circle the product in the equation above.
   b. Underline the coefficient in the equation above.
   c. How many atoms of Nitrogen are in the reactant side. _____
   d. Are any atoms created or destroyed in this reaction? Explain.

      _____

      _____
8. Record the name and formulas of the reactants and products of methane combustion.

   _____

   _____
9. According to the law of conservation of mass, why must a chemical equation be balanced?

   _____

   _____
10. Why are coefficients used to balance equations?

    _____
11. Because mass is conserved in a chemical reaction, chemical equations must be balanced. Use the Math Tool Box on Page 95, to match the answer to the following questions.
    a. None of the atoms in balance _____
    b. Oxygen atoms not balanced _____
    c. Iron atoms not balanced _____
    d. All the atoms balanced _____
12. What is the difference between an open and closed system?

    _____

    _____
13. A neighbor wants to use his backyard garden to conduct an investigation of how tomato plants use specific amounts of carbon dioxide and water to grow at a certain rate. Is this a good idea? Explain.

_____

_____

14. What are 3 general types of chemical reactions?

_____

15. Explain why magnesium oxide is created in a synthesis reaction.

_____

_____

16. Define a decomposition reaction.

_____

_____

17. Write a sentence using the word decomposition.

_____

18. What happens in a replacement reaction.

_____

19. Aluminum (Al) and silver tarnish (Ag_2S) yield pure silver (Ag) in an aluminum sulfide solution.

$$3Ag_2S + 2Al \rightarrow 6\,Ag + Al_2S_3$$

a. What are the reactants and products in this reaction?

_____

_____

b. Is this reaction a replacement reaction? Explain.

_____

_____