

Chemical Reactions ▪ *Guided Reading and Study***Describing Chemical Reactions**

This section explains how to show chemical reactions with symbols. It also states the principle of conservation of mass, and identifies three categories of chemical reactions.

Use Target Reading Skills

After you read the section, reread the paragraphs that contain definitions of Key Terms. Use all of the information you have learned to write a meaningful sentence using each Key Term.

a. chemical equation: _____

b. reactant: _____

c. product: _____

d. conservation of mass: _____

e. open system: _____

f. closed system: _____

g. coefficient: _____

h. synthesis: _____

i. decomposition: _____

j. replacement: _____

Chemical Reactions ▪ *Guided Reading and Study***What Are Chemical Equations?**

1. What is a chemical equation?

2. Is the following sentence true or false? Chemical equations use symbols instead of words to summarize chemical reactions.

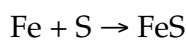
3. If a molecule of carbon dioxide is involved in a chemical reaction, how is it represented in the chemical equation for the reaction?

4. The substances you have at the beginning of a chemical reaction are called the _____.

5. The substances you have when a chemical reaction is complete are called the _____.

6. What do you read the arrow in a chemical equation as meaning?

7. Label each formula in the chemical equation below as either a reactant or a product.



- a. Fe _____ b. S _____

- c. FeS _____

8. Circle the letter of each statement that is true about chemical equations.

- a. Chemical equations have no real structure.
- b. A chemical equation summarizes a reaction.
- c. The formulas for the reactants are written on the right.
- d. Symbols in the equation show the reactants and the products.

Conservation of Mass

9. Is the following sentence true or false? All the atoms present at the start of a reaction are present at the end. _____

10. At the end of a chemical reaction, what is the total mass of the reactants compared to the total mass of the products?

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11. What is the principle called the conservation of mass?

12. Describe an open system.

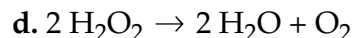
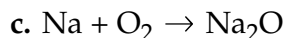
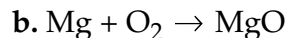
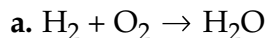
13. What is an example of a closed system?

Balancing Chemical Equations

14. When is a chemical equation balanced?

15. How many atoms of oxygen are there on each side of the following chemical equation: $2 \text{Mg} + \text{O}_2 \rightarrow 2 \text{MgO}$?

16. Circle the letter of each chemical equation that is balanced.

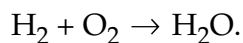


17. A number placed in front of a chemical formula in a chemical equation is called a(n) _____.

18. What does a coefficient tell you?

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19. Tell why this chemical equation is not balanced:



20. Write a balanced equation for this reaction: Oxygen reacts with hydrogen to yield water.

Classifying Chemical Reactions

21. In what three categories can chemical reactions be classified?

22. Which category of chemical reactions comes from a term that means “to put things together”?

23. Complete the table about the three categories of chemical reactions.

Categories of Chemical Reactions		
Category	Description	Example Chemical Equation
a.	Two or more substances combine to make a more complex compound.	$2 \text{SO}_2 + \text{O}_2 + 2 \text{H}_2\text{O} \rightarrow \text{H}_2\text{SO}_4$
Decomposition	b.	$2 \text{H}_2\text{O}_2 \rightarrow 2 \text{H}_2\text{O} + \text{O}_2$
c.	One element replaces another in a compound, or two elements in different compounds trade places.	$2 \text{CuO} + \text{C} \rightarrow 2 \text{Cu} + \text{CO}_2$

Chemical Reactions ▪ *Guided Reading and Study***Describing Chemical Reactions** *(continued)*

Classify each of the following equations as synthesis, decomposition, or replacement.

