Review and Assessment

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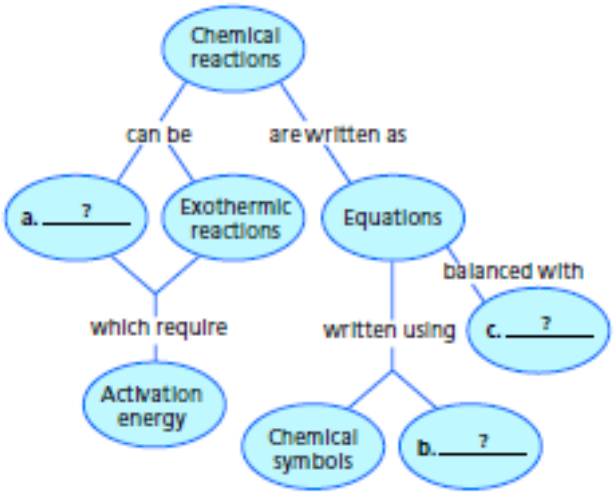
Organizing Information

Concept Mapping Copy the chemical reactions concept map onto a separate sheet of paper. Then complete it and add a title. (For more on Concept Mapping, see the Skills Handbook.)



Reviewing Key Terms

Choose the letter of the best answer.

1. Which of the following is *not* a physical property?
   - **a.** flexibility
   - **b.** ability to catch fire
   - **c.** melting point
   - **d.** ability to conduct electricity
2. A chemical reaction that gives off heat is likely to be
   - **a.** endothermic.
   - **b.** a precipitate.
   - **c.** a physical change.
   - **d.** exothermic.
3. You can balance a chemical equation by changing the
   - **a.** subscripts.
   - **b.** coefficients.
   - **c.** reactants.
   - **d.** products.
4. A chemical reaction in which two elements combine to form a compound is called a
   - **a.** synthesis reaction.
   - **b.** replacement reaction.
   - **c.** decomposition reaction.
   - **d.** precipitation reaction.
5. The activation energy of a chemical reaction
   - **a.** is supplied by a catalyst.
   - **b.** is released at the end.
   - **c.** starts the reaction.
   - **d.** changes with time.
6. A chemical reaction in which a fuel combines rapidly with oxygen is a (an)
   - **a.** inhibited reaction.
   - **b.** combustion reaction.
   - **c.** enzyme reaction.
   - **d.** endothermic reaction.

Writing in Science

Explanation You are a writer for a children's book about chemistry. Write a paragraph that young children would understand that explains the concept of "activation energy." Be sure to use examples, such as the burning of wood or gas.

Discovery Channel School

Chemical Reactions
Video Preview
Video Field Trip
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Review and Assessment

Checking Concepts

7. What are the two kinds of changes that occur in matter? Describe how you can tell one from the other.
8. Why can't you balance a chemical equation by changing the subscripts of the reactants or the products?
9. You find the mass of a piece of iron metal, let it rust, and measure the mass again. The mass has increased. Does this violate the principle of conservation of mass? Explain.
10. How do enzymes in your body make chemical reactions occur at safe temperatures?
11. Why does spraying water on a fire help to put the fire out?
12. How are inhibitors useful in controlling chemical reactions?

Thinking Critically

13. **Problem Solving** Steel that is exposed to water and salt rusts quickly. If you were a shipbuilder, how would you protect a new ship? Explain why your solution works.
14. **Classifying** The following are balanced equations for chemical reactions. Classify each of the equations as synthesis, decomposition, or replacement.
    a. $2\ Al + Fe_2O_3 \longrightarrow 2\ Fe + Al_2O_3$
    b. $2\ Ag + S \longrightarrow Ag_2S$
    c. $CaCO_3 \longrightarrow CaO + CO_2$
    d. $2\ NO + O_2 \longrightarrow 2\ NO_2$
15. **Relating Cause and Effect** Firefighters open doors very carefully because sometimes a room will burst violently into flames when the door is opened. Based on your knowledge of the fire triangle, explain why this happens.
16. **Inferring** Some statues are made of materials that can react in acid rain and begin to dissolve. It has been observed that statues with smooth surfaces are dissolved by acid rain much slower than statues with very detailed carvings. Explain this observation.

Math Practice

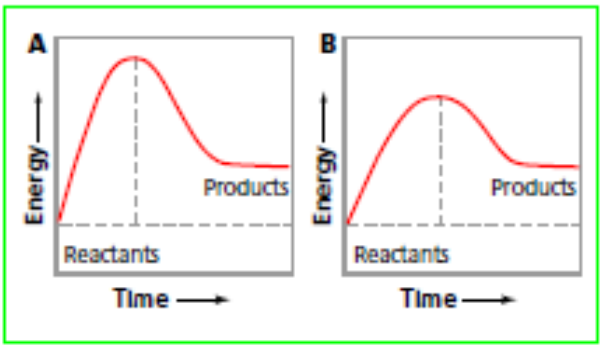
Balance the chemical equations in Questions 17–20.

17. $MgO + HBr \longrightarrow MgBr_2 + H_2O$
18. $N_2 + O_2 \longrightarrow N_2O_5$
19. $C_2H_4 + O_2 \longrightarrow CO_2 + H_2O$
20. $Fe + HCl \longrightarrow FeCl_2 + H_2$

Applying Skills

Use the energy diagram to answer Questions 21–23.

The two graphs below represent the same chemical reaction under different conditions.



21. **Interpreting Data** How does the energy of the products compare with the energy of the reactants?
22. **Classifying** Tell whether this reaction is exothermic or endothermic.
23. **Applying Concepts** What change in condition might account for the lower "hump" in the second graph? Explain.

Lab zone Chapter Project

Performance Assessment Make a poster of your test results. Display your reaction chamber for the class. Discuss how your chamber was built to the specifications agreed upon by the class. Describe its safety features. Based on your results, rate how effectively your chamber works as a closed system.