Section 7.4 Reaction Rates
(pages 212–215)

This section discusses the factors that affect reaction rates.

Reading Strategy (page 212)
Building Vocabulary As you read, complete the web diagram below with key terms from this section. For more information on this Reading Strategy, see the Reading and Study Skills in the Skills and Reference Handbook at the end of your textbook.

Reactions Over Time (page 212)
1. Any change that happens over time can be expressed as a(n) __________.

2. A reaction rate is the rate at which ______________ change into ______________ over time.

Factors Affecting Reaction Rates (pages 213–215)
3. Is the following sentence true or false? The rate of any reaction is a constant that does not change when the reaction conditions change. ______________

4. Generally, an increase in temperature will ______________ the reaction rate.

5. Is the following sentence true or false? Storing milk in a refrigerator stops the reactions that would cause the milk to spoil. ______________

6. An increase in surface area ______________ the exposure of reactants to one another. Circle the correct answer.
   increases decreases

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7. Stirring the reactants in a reaction mixture will generally ______________ the reaction rate. Circle the correct answer.
   decrease maintain increase

8. Is the following sentence true or false? Increasing the concentration of the reactants will generally slow down a chemical reaction.

9. Is the following sentence true or false? A piece of material dipped in a concentrated dye solution will change color more quickly than in a dilute dye solution.

10. A ______________ is a substance that affects the rate of a reaction without being used up in the reaction.

11. Circle the letters of the sentences that correctly identify why chemists use catalysts.
   a. to speed up a reaction
   b. to enable a reaction to occur at a higher temperature
   c. to enable a reaction to occur at a lower temperature

12. Is the following sentence true or false? Because a catalyst is quickly consumed in a reaction, it must be added to the reaction mixture over and over again to keep the reaction going.

13. Fill in the blank where the catalyst V$_2$O$_5$ should go in the formula shown and write it in the correct location.

    _________ + 2SO$_2$ + O$_2$ → 2SO$_3$ + _________

14. Circle the letter of the correct answer. In the reaction represented by the equation $2\text{H}_2\text{O}_2$ $\xrightarrow{\text{Pt}}$ $2\text{H}_2\text{O} + \text{O}_2$, which substance acts as a catalyst?
   a. H$_2$O$_2$
   b. Pt
   c. H$_2$O

15. One way that a catalyst can lower the energy barrier of a reaction is by providing a surface on which the ______________ can come together. Circle the correct answer.
   catalysts reacting particles products