Reading Questions 5.4 Name _____
Rates of Change Pp. 169 – 176

1. Write the five chapter objectives here:
    a.
    b.
    c.
    d.
    e.
2. What two ways can you increase the cooking speed of potatoes?
    a.
    b.
3. Read Figure 5-17. What two things can nitroglycerin be used for?
    a.
    b.
4. What does heating food do?
5. What does cooling food do?
6. Faster motion increases the _____ of the particles and _____ the chances that particles will _____.
7. What does the statement in #6 mean?
8. Read Figure 5-19. What becomes larger when a solid is divided into smaller pieces?
9. Why does a large surface area increase a reaction rate?
10. Why do more concentrated solutions react faster?
11. Why is a gas at higher pressure more concentrated?
12. Gases react (faster OR slower – choose one) at higher pressure. Why?
13. In a volume with equal number of light and heavy particles, what molecules will collide more often?
14. When are catalysts added to reactions?
15. What is the main function of a catalyst?
16. Catalysts that speed up a reaction are called _____.
17. Even though catalysts are expensive, how are they profitable?
18. What makes solid catalysts more effective?
19. What happens to enzymes that get too hot or cold?
20. What temperature do most enzymes stop working at?
21. Read Table 5-1. Determine the answer of the following:
    a. What enzyme breaks down fat molecules?

b. What is the substrate that protease works on?
c. What does cellulase break down?
d. What breaks down long starch molecules?
e. What enzyme builds DNA chains?

22. Copy the equation that catalase reacts in to break down hydrogen peroxide:

23. Not all reactions will go to completion. Some reactions are _____.
24. How are carbonated drinks manufactured?
25. When a soda bottle is opened, what happens?
26. Even though carbon dioxide molecules are moving in and out of solution constantly, the amount of dissolved and undissolved carbon dioxide remains the same. Why does it remain the same?
27. When a carbonated drink bottle is opened, the system is no longer in equilibrium. How does the carbon dioxide leave?
28. Lime, made from heating limestone, was used to help make _____.
29. When lime is heated in a closed container however, equilibrium of the reaction is established. Write the equation as written in the book here:
30. Copy Table 5-2 from page 175.

Condition	**Effect**

31. Copy LeChatelier's principle here:

32. In the chemical reactions shown on page 175, what conditions do you need to be able to make the most ammonia from the reaction?
33. What process is a good example of balancing equilibrium conditions?
34. Read Figure 5-24. What is the name of one of the space shuttle's fuels?
35. Read the box titled "Integrating Environmental Science". What organism is responsible for the conversion of nitrogen into different compounds and then back into nitrogen compounds?