

## CHAPTER 9.2—9.5: Respiration Reactions

1. List two classes of prokaryotes that utilize anaerobic respiration and explain what molecules they use as electron acceptors (instead of oxygen).

a. \_\_\_\_\_

b. \_\_\_\_\_

### 2. STAGE 1: Glycolysis

a. occurs where? \_\_\_\_\_

b. starts with? \_\_\_\_\_

c. produces? \_\_\_\_\_

d. yields how much ATP? \_\_\_\_\_

e. produces ATP through what process? \_\_\_\_\_

3. Why is glycolysis thought to be one of the earliest of all biochemical processes that evolved?

\_\_\_\_\_  
\_\_\_\_\_

### 4. STAGE 2: Oxidation of Pyruvate

a. occurs where? \_\_\_\_\_

b. starts with? \_\_\_\_\_

c. produces? \_\_\_\_\_

d. yields how much ATP? \_\_\_\_\_

### 5. STAGE 3: The Citric Acid (Krebs) Cycle

a. occurs where? \_\_\_\_\_

b. starts with? \_\_\_\_\_

c. produces? \_\_\_\_\_

d. yields how much ATP? \_\_\_\_\_

e. produces ATP through what process? \_\_\_\_\_

Name: \_\_\_\_\_

6. What is the major function of the Krebs' cycle?

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**7. STAGE 4: The Electron Transport Chain**

a. occurs where? \_\_\_\_\_

b. starts with? \_\_\_\_\_

c. produces? \_\_\_\_\_

d. yields how much ATP? \_\_\_\_\_

e. produces ATP through what process? \_\_\_\_\_

8. What is the final electron acceptor in the Electron Transport Chain?

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9. Describe the role of the Electron Transport Chain. What happens to the electrons and H<sup>+</sup>?

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10. What is chemiosmosis?

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11. Explain how ATP synthase produces ATP.

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12. Explain why respiration is considered exergonic.

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Question Set 18-20

13. In your own words, describe oxidative phosphorylation.

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14. What is the main reason energy is harvested in stages (and not all at once) in respiration?

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15. Write the summary equation for cellular respiration:

a. Where did the glucose come from? Where did it go? \_\_\_\_\_

b. Where did the O<sub>2</sub> come from? Where did it go? \_\_\_\_\_

c. Where did the CO<sub>2</sub> come from? Where did it go? \_\_\_\_\_

d. Where did the H<sub>2</sub>O come from? \_\_\_\_\_

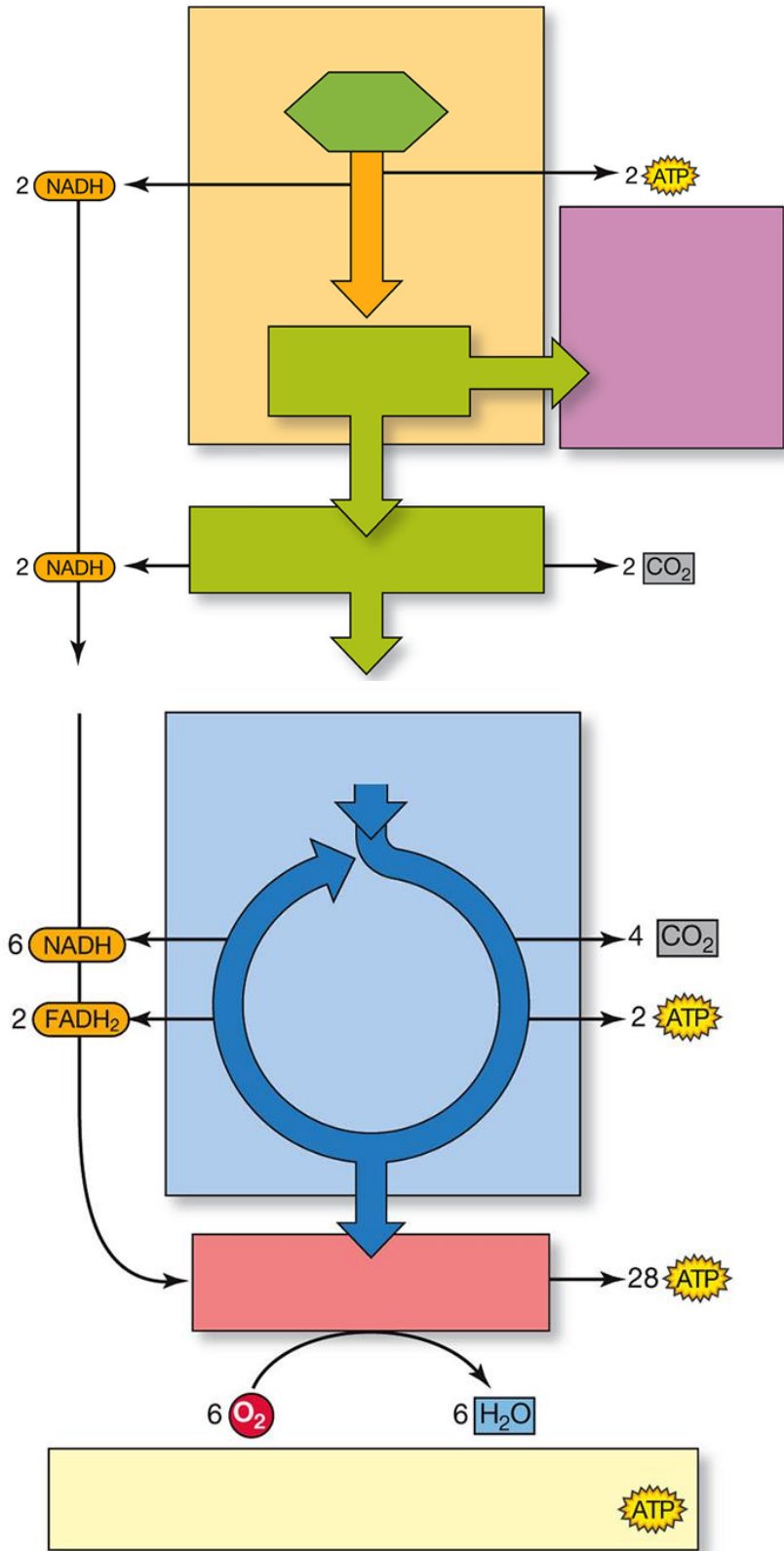
e. Where did the ATP come from? \_\_\_\_\_

f. What else is used and/or produced that is not listed in the above equation? \_\_\_\_\_

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17. Using **Figure 9.12** from your text, add all missing labels!



**18. Fermentation**

a. Alcoholic fermentation converts glucose to \_\_\_\_\_

b. Alcoholic fermentation is utilized by what organisms? \_\_\_\_\_

c. Lactic acid fermentation converts glucose to \_\_\_\_\_

d. Lactic acid fermentation is utilized by what organisms? \_\_\_\_\_

**19. Big Picture Thought Questions**

a. Why do we eat? \_\_\_\_\_

b. Why do we breathe? \_\_\_\_\_

20. What was the evolutionary advantage of the proto-eukaryotes that engulfed aerobic bacteria but did not digest them?