

SECTION 9-1 REVIEW

CHEMICAL PATHWAYS

VOCABULARY REVIEW Define the following terms.

1. **cellular respiration** _____

2. **glycolysis** _____

3. **calorie** _____

4. **fermentation** _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. Glycolysis takes place
 - a. in the cytoplasm.
 - b. in the mitochondria.
 - c. only if oxygen is present.
 - d. only if oxygen is absent.
- _____ 2. During glycolysis, glucose is
 - a. produced from two molecules of pyruvic acid.
 - b. converted into two molecules of ATP.
 - c. broken down into two pyruvic acid molecules and some of the stored energy released.
 - d. partially broken down into CO₂ and H₂O.
- _____ 3. Both lactic acid fermentation and alcoholic fermentation regenerate
 - a. CO₂ from pyruvic acid.
 - b. NAD⁺ from NADH.
 - c. ATP from ADP and phosphate.
 - d. alcohol.
- _____ 4. Glycolysis provides a cell with a net gain of _____ ATP molecules.
 - a. 0
 - b. 2
 - c. 4
 - d. 36
- _____ 5. One cause of muscle soreness is
 - a. lactic acid fermentation.
 - b. alcoholic fermentation.
 - c. glycolysis.
 - d. the Krebs cycle.

SHORT ANSWER Answer the questions in the space provided.

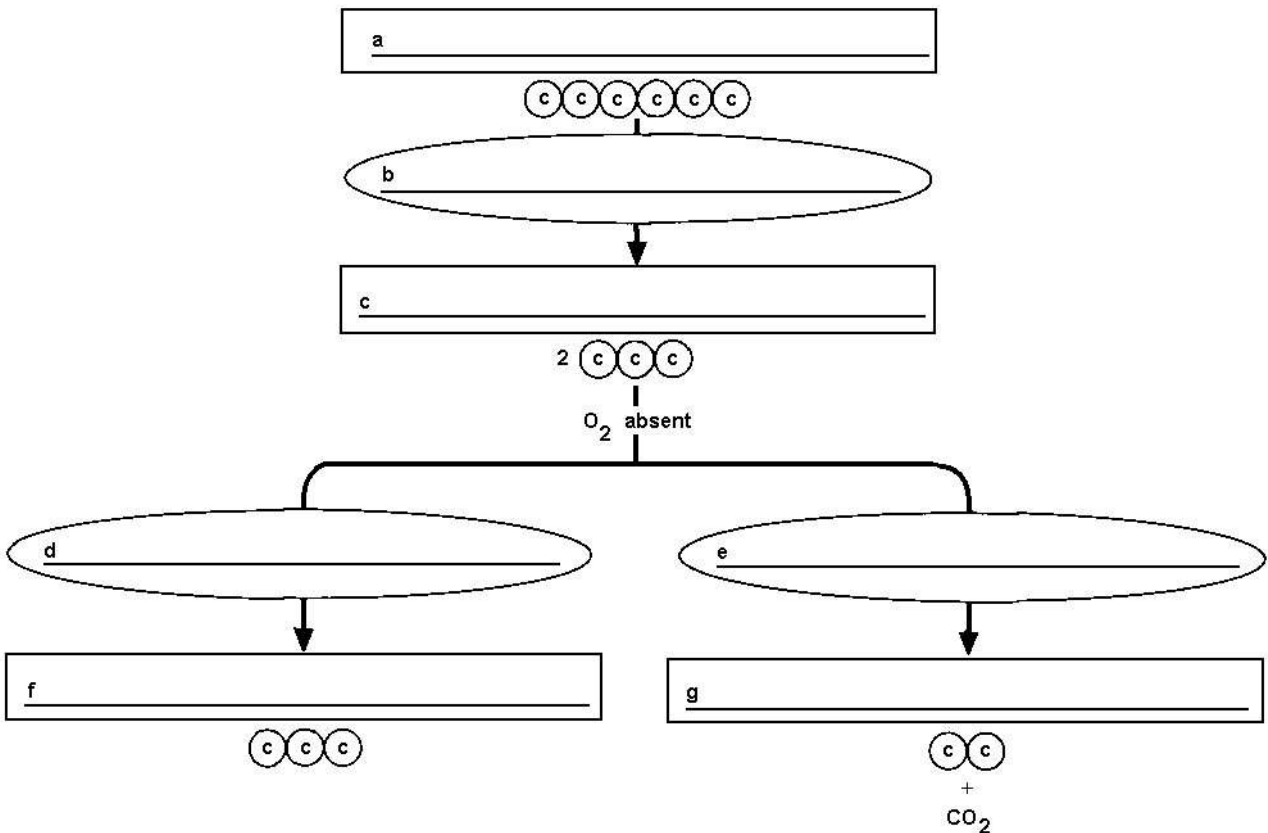
1. Why are fermentation pathways referred to as “anaerobic” pathways? (p.224) _____

2. What are the energy containing products of glycolysis? (p.223) _____

3. Of what importance are lactic acid fermentation and alcoholic fermentation to the cells that use these pathways? (p.224) _____

4. The vitamin niacin is an essential component of NAD⁺. Niacin can be consumed in food or manufactured in the body from tryptophan, an amino acid. How would a person’s ability to break down glucose through glycolysis be affected if a person’s diet were deficient in both niacin and tryptophan? Explain your answer. (p.224)

STRUCTURES AND FUNCTIONS The diagram below depicts the stages of glycolysis and fermentation. Complete the diagram by writing the names of the pathways in the ovals and the names of the molecules in the boxes. Use the following terms: alcohol, lactic acid, glucose, pyruvic acid, alcoholic fermentation, glycolysis, lactic acid fermentation. (pp.224-225)



SECTION 9-2 REVIEW

KREBS CYCLE AND ELECTRON TRANSPORT

VOCABULARY REVIEW Define the following terms.

- 1. **aerobic** _____

- 2. **Krebs cycle** _____

- 3. **electron transport chain** _____

- 4. **creatine phosphate(p.233)** _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. Which of the following best represents the waste products of cellular respiration?
a. just CO₂ b. just H₂O c. O₂ and H₂O d. CO₂ and H₂O
- _____ 2. During heavy exercise, the buildup of lactic acid in muscle cells results in
a. alcoholic fermentation. c. oxygen debt.
b. the Calvin cycle. d. the Krebs cycle.
- _____ 3. A total of 36 molecules of ATP are produced from one molecule of glucose as a result of
a. cellular respiration. c. glycolysis.
b. alcoholic fermentation. d. lactic acid fermentation.
- _____ 4. The electron transport chain uses the high energy electrons from the Krebs cycle to
a. produce glucose. c. convert ADP to ATP.
b. convert ATP to sugar. d. produce GTP.
- _____ 5. The Krebs cycle takes place within the
a. chloroplast. b. nucleus. c. mitochondrion. d. cytoplasm.
- _____ 6. What is another name for the Krebs cycle?
a. the glycolysis cycle c. alcoholic fermentation
b. the citric acid cycle d. the respiration cycle

SHORT ANSWER Answer the questions in the space provided.

1. On the lines provided, identify which phase describes the following processes: cellular respiration, glycolysis, lactic acid fermentation, or alcoholic fermentation. (pp.222-225)
 - a. important in baking industry _____
 - b. builds up in muscles after a few seconds of intense activity _____
 - c. the reason why runners breathe heavily after a race _____
 - d. almost the opposite process of photosynthesis _____

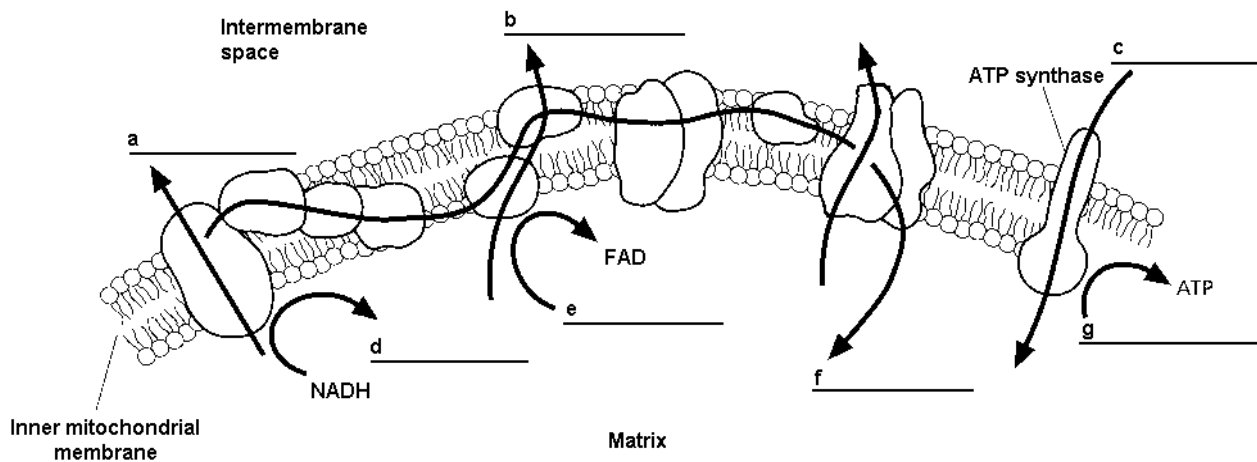
2. Identify the electron carriers of cellular respiration. Discuss the relationship between the electron carriers and the electron transport chain. (p.228) _____

3. How are photosynthesis and cellular respiration opposite in terms of carbon dioxide? (p.232) _____

4. What causes the H⁺ ions in the intermembrane space to move through the ATP synthase channels and into the matrix of the mitochondrion? (p.229) _____

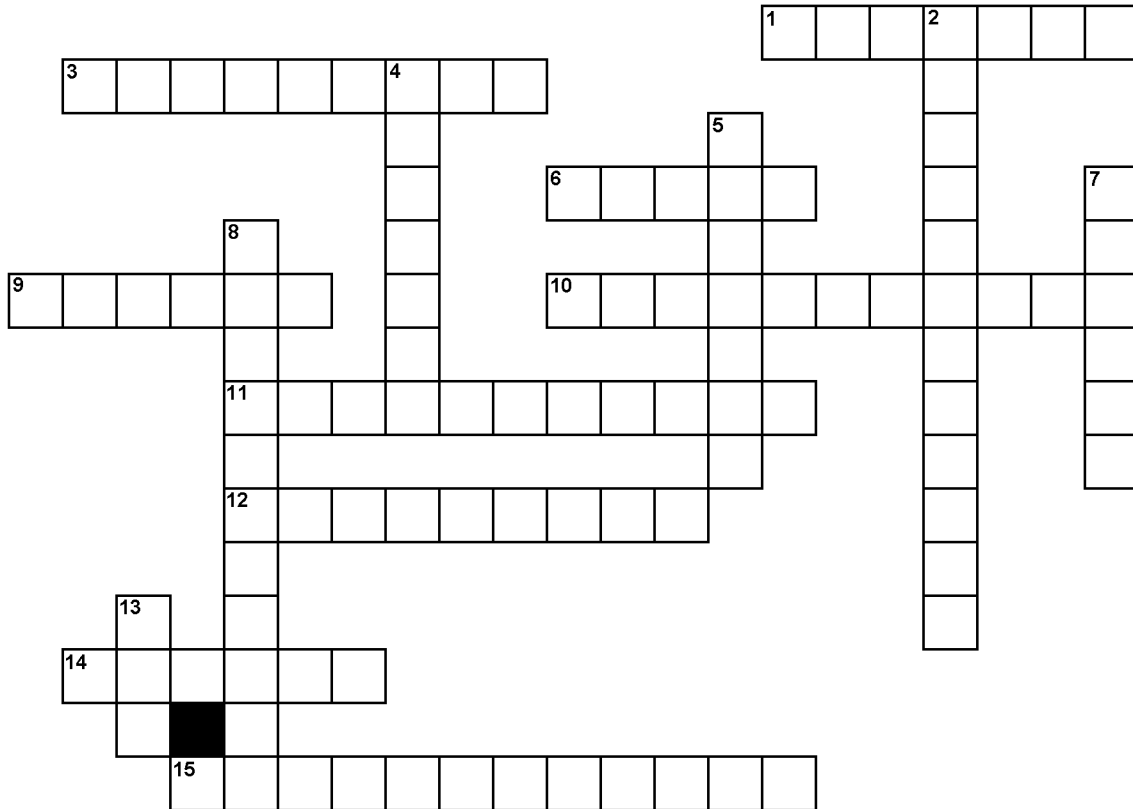
STRUCTURES AND FUNCTIONS Use the diagram to answer the following questions.

The diagram below summarizes the electron transport chain and the production of ATP in aerobic respiration. Label the substances that are transported along the arrows labeled *a-c* in the spaces provided. Label the reactants or products that are represented by *d-g* in the spaces provided. (p.228)



VOCABULARY - CHAPTER 9

The crossword puzzle is a simple way to master some of the more important vocabulary terms in this chapter.



Across

1. a six carbon sugar that is used most often in cellular respiration
3. the location of glycolysis
6. electrons combine with oxygen and hydrogen ions to form metabolic _____
9. _____ acid is a product of fermentation produced by muscle cells in the absence of oxygen
10. the amount of heat needed to raise the temperature of 1000 mL of water one degree Celsius
11. _____ acid is a four carbon compound of the Krebs cycle, which represents the beginning of the cycle
12. in the absence of oxygen
14. fluid filled, inner area of the mitochondria where the Krebs cycle takes place
15. pathways used in the absence of oxygen

Down

2. the process of generating ATP by the flow of hydrogen ions through a specific enzyme channel
4. fermentation product made by yeast cells
5. in the presence of oxygen
7. _____-CoA is a two carbon fragment that enters into the beginning of Krebs cycle
8. a large unit of heat energy; same as 10 across
13. an electron carrier that transports H atoms; nicotinamide adenine dinucleotide abbreviated

The following terms are **not** used in this chapter but are found in this puzzle. Use a reference source and look up their meanings so you can complete this vocabulary puzzle. **oxaloacetic and chemiosmosis.**