Homework 4.4: Overview of Cellular Respiration

KEY CONCEPT

The overall process of cellular respiration converts sugar into ATP using oxygen.

VOCABULARY

cellular respiration	anaerobic
aerobic	Krebs cycle
glycolysis	

MAIN IDEA: Cellular respiration makes ATP by breaking down sugars.

Circle the word or phrase that best completes the statement.

- 1. Cellular respiration is a process that releases *glucose / energy* from sugars and other carbon-based molecules to make ATP when *oxygen / carbon dioxide* is present.
- 2. Cellular respiration is called an aerobic process, because it needs *oxygen / carbon dioxide* to take place.
- 3. Cellular respiration takes place in the *chloroplasts / mitochondria*.
- 4. During glycolysis, one molecule of *glucose / protein* is split into two three-carbon molecules and two *ADP / ATP* are formed.

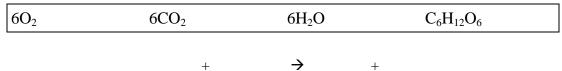
MAIN IDEA: Cellular respiration makes ATP by breaking down sugars.

- 5. Circle the <u>two</u> ways in which cellular respiration seems to be the opposite of photosynthesis.
 - a. The reactions occur at either end of the chloroplast.
 - b. The overall chemical equations are the reverse of each other.
 - c. Cellular respiration breaks down sugars to make ATP, and photosynthesis uses ATP to make sugars.
 - d. Cellular respiration produces oxygen, and photosynthesis produces carbon dioxide.
- 6. Circle the two parts of a mitochondrion where cellular respiration takes place.
 - a. matrix
 - b stroma
 - c. inner mitochondrial membrane
 - d. outer mitochondrial membrane

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7. The overall process of cellular respiration can be written as a chemical equation. Fill in the blanks in the equation below using the appropriate compound from the box.



- 8. The two reactants in the cellular respiration equation are _____ and
- 9. The two products in the cellular respiration equation are _____ and
- 10. Why is the cellular respiration equation written with several arrows?
 - a. Because a series of products result from the reaction.
 - b. Because a series of reactants enter into the reaction.
 - c. Because a series of chemicals is added to the process.
 - d. Because a series of chemical reactions occurs.
- 11. Use the space below to sketch a mitochondrion. Label the matrix and inner membrane. Indicate where each of the following steps of the cellular respiration process occurs.
 - a. Energized electrons are passed along the electron transport chain in the inner mitochondrial membrane.
 - b. Energy is transferred to the second stage of cellular respiration (the electron transport chain).
 - c. A large number of ATP are formed. Oxygen picks up electrons, and water is released as a waste product.
 - d. Three-carbon molecules enter the Krebs cycle and are broken down. ATP and other energy-carrying molecules are formed. Carbon dioxide is released as a waste product.

Cellular Respiration

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Vocabulary Check

Fill in the blank with the word or phrase that best completes the sentence.

- 12. The prefix glyco- comes from a Greek word that means "sweet." The suffix -lysis comes from a Greek word that means "to loosen." Therefore, during glycolysis, a _____ is broken down (or "loosened").
- 13. Glycolysis is an anaerobic process, because it takes place without
- 14. During the Krebs cycle, chemical reactions ______ carbonbased molecules.

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