CHAPTER 6 STUDY GUIDE

IMPORTANT IDEAS

- Living cells are composed of a variety of structures, each with a particular function. (Modules 6.1-6.15)

LEARNING OBJECTIVES

Upon successful completion of **Modules 6.1-6.15** you will be able to

1. Describe the role of oxidation-reduction (redox) reactions in the cell and recognize examples.
2. Write the summary reaction of cellular respiration and indicate the reactants and products, their cellular sites of use or production, relative energy levels, which have become oxidized and which have become reduced, and how each relates to food and breathing.
3. Identify which molecules are being oxidized and which are being reduced in a given redox reaction, and state the potential energy changes in each.
4. Describe the role of electron carriers in metabolism and provide examples (names).
5. Name the three main reaction sequences of cellular respiration that convert glucose ($C_6H_{12}O_6$) to pyruvate, pyruvate to acetyl-CoA, and acetyl-CoA to carbon dioxide (CO_2), state where they occur in the cell, and list their reactants and products.
6. Interpret a given metabolic pathway (i.e. identify reactants, intermediates, and products)
7. Define the following terms: substrate level phosphorylation, oxidative phosphorylation, electron transport chain, chemiosmosis, and ATP synthase.
8. Describe or label a diagram showing the electron transport chain component of oxidative phosphorylation including its cellular location, and reactants and products.
9. Describe or label a diagram showing the process of chemiosmosis in oxidative phosphorylation, including its cellular location, and reactants and products.
10. State the maximum number of ADPs phosphorylated (ATPs produced) per glucose during glycolysis, pyruvate oxidation, citric acid cycle, and oxidative phosphorylation, and the grand total from the complete oxidation of glucose to CO_2 and H_2O during cellular respiration.
11. Compare and contrast fermentation and cellular respiration in terms of cellular location, reactants and products, and maximum ATP yield per glucose.