

24.6

METABOLISM

Section Review

Objectives

- Explain the function of ATP in living cells
- Distinguish between catabolism and anabolism
- Explain the nitrogen cycle

Vocabulary

- adenosine triphosphate
- metabolism
- catabolism
- anabolism

Part A Completion

Use this completion exercise to check your understanding of the concepts and terms that are introduced in this section. Each blank can be completed with a term, short phrase, or number.

_____ 1 _____ is the primary energy-storing molecule found in cells of all organisms. ATP is formed when a molecule of _____ 2 _____ condenses with a molecule of phosphoric acid. The energy needed to phosphorylate ADP comes from the energy released by the _____ 3 _____ of higher-energy compounds.

Every mole of ATP hydrolyzed back to ADP releases about _____ 4 _____ of energy. Cells use this energy to drive processes that would ordinarily be _____ 5 _____. ATP is used to transmit energy between _____ 6 _____ reactions and _____ 7 _____ reactions in the cell. Because cellular _____ 8 _____ never stops, the cycle of producing and breaking down ATP occurs continuously.

The set of reactions in living cells in which substances are broken down and energy is produced is called _____ 9 _____. The set of reactions in which the simple compounds produced by catabolism are used to synthesize more complex molecules is called _____ 10 _____.

Part B True-False

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

- _____ 11. The complete oxidation of glucose to carbon dioxide and water is one of the most important catabolic reactions in the cell.
- _____ 12. Metabolism is the sum of the enzyme-catalyzed chemical and energy changes that occur in cells.
- _____ 13. Anabolic reactions produce energy.
- _____ 14. Adenosine triphosphate (ATP) is a ribonucleotide.
- _____ 15. ATP has less potential chemical energy than ADP.

Part C Matching

Match each description in Column B to the correct term in Column A.

Column A	Column B
_____ 16. catabolism	a. an energy-storing molecule used to drive anabolic processes in the cell
_____ 17. metabolism	b. the set of all chemical reactions that occur within a living organism
_____ 18. anabolism	c. reactions in which simple molecules are used to synthesize more complex molecules
_____ 19. ATP	d. energy-yielding reactions in which larger molecules are degraded to smaller molecules

Part D Question

Answer the following question in the space provided.

20. Many reactions associated with the growth and replication of cells in living organisms are nonspontaneous. How are these reactions driven forward?
