

Chapter 9

Energy in a Cell

Reinforcement and Study Guide

Section 9.1 The Need for Energy

In your textbook, read about cell energy.

Use each of the terms below just once to complete the passage.

energy
ATP

phosphate
chemical bonds

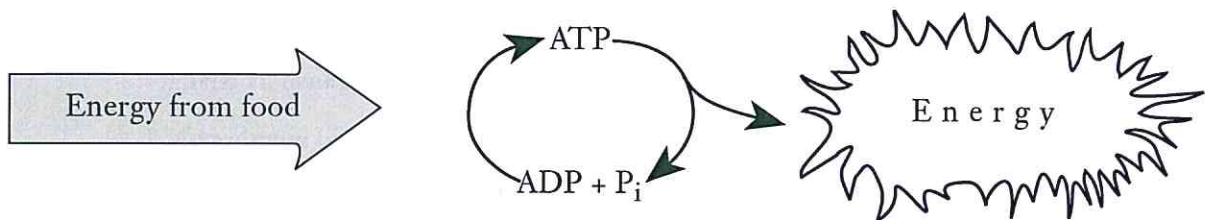
adenine
work

charged
ribose

To do biological **(1)** _____, cells require energy. A quick source of energy that cells use is the molecule **(2)** _____. The **(3)** _____ in this molecule is stored in its **(4)** _____. ATP is composed of a(n) **(5)** _____ molecule bonded to a(n) **(6)** _____ sugar. Three **(7)** _____ molecules called **(8)** _____ groups are attached to the sugar.

In your textbook, read about forming and breaking down ATP and the uses of cell energy.

Examine the diagram below. Then answer the questions.



9. How is energy stored and released by ATP?

10. How do cells use the energy released from ATP?

Chapter

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Energy in a Cell, *continued*

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Section 9.2 Photosynthesis: Trapping the Sun's Energy

In your textbook, read about trapping the sun's energy.

Determine if the statement is true. If it is not, rewrite the italicized part to make it true.

1. Photosynthesis is the process plants use to trap the sun's energy to make *glucose*.

2. ATP molecules are made during the *light-independent* reactions of photosynthesis.

3. *Carbon dioxide* gas is produced during photosynthesis.

4. The light-dependent reactions of photosynthesis take place in the membranes of the thylakoid discs in *mitochondria*.

5. The thylakoid membranes contain chlorophyll and other pigments that *absorb* sunlight.

In your textbook, read about the light-dependent reactions of photosynthesis.

Number the following steps of the light-dependent reactions in the order in which they occur.

- _____ 6. The energy lost by electrons as they pass through the electron transport chain is used to make ATP.
- _____ 7. The electrons pass from the chlorophyll to an electron transport chain.
- _____ 8. Sunlight strikes the chlorophyll molecules in the thylakoid membranes.
- _____ 9. NADP⁺ molecules change to NADPH as they carry the electrons to the stroma of the chloroplast.
- _____ 10. The sunlight's energy is transferred to the chlorophyll's electrons.
- _____ 11. The electrons are passed down a second electron transport chain.

Answer the following questions.

12. How are the electrons that are lost by the chlorophyll molecules replaced?

13. How do plants produce oxygen during photosynthesis?

