

CHAPTER 10 ACTIVE READING WORKSHEETS

DNA, RNA, AND PROTEIN SYNTHESIS

Section 10-2: DNA Structure

Read the passage below, which covers topics from your textbook.
Answer the questions that follow.

¹ The nucleic acid DNA is an organic compound. ² DNA is made up of repeating subunits called nucleotides. ³ Each DNA molecule consists of two long chains of nucleotides. ⁴ A DNA nucleotide has three parts: a sugar molecule called **deoxyribose**; a phosphate group, which consists of a phosphorus, P, atom surrounded by oxygen, O, atoms; and a molecule that is referred to as a **nitrogenous base** because it contains nitrogen, N, atoms. ⁵ The deoxyribose sugar and the phosphate group are identical in all DNA nucleotides. ⁶ However, the nitrogenous base may be any one of four different kinds.

⁷ The four nitrogenous bases found in DNA nucleotides are adenine, guanine, cytosine, and thymine. ⁸ It is customary to represent nucleotides by the abbreviations for their nitrogenous bases. ⁹ A nucleotide containing adenine is represented by A. Likewise, C = cytosine, G = guanine, and T = thymine.

Read each question and write your answer in the space provided.

SKILL: Identifying Main Ideas

1. Which sentence notes the main idea of the passage?

2. What is the main idea of the passage?

3. What supporting detail does Sentence 3 provide the reader?

Circle the letter of the word or phrase that best completes the analogy.

4. *G* is to guanine as *C* is to
- a. cell.
 - b. nitrogenous base.
 - c. adenine.
 - d. cytosine.

SECTION 10-2 REVIEW

DNA STRUCTURE

VOCABULARY REVIEW Define the following terms and provide one example for each.

1. purine _____

2. pyrimidine _____

3. complementary base pair _____

4. nitrogenous base _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. The primary function of DNA in cells is to
 - a. serve as a storage form for unused nucleotides.
 - b. occupy space in the nucleus to keep the nucleus from collapsing.
 - c. store information that tells the cells which proteins to make.
 - d. serve as a template for making long, spiral carbohydrates.
- _____ 2. The two strands of a DNA molecule are held together by
 - a. ionic bonds.
 - b. covalent bonds.
 - c. peptide bonds.
 - d. hydrogen bonds.
- _____ 3. According to the base-pairing rules, guanine binds with
 - a. cytosine.
 - b. adenine.
 - c. thymine.
 - d. guanine.
- _____ 4. Which of the following is NOT a correct structure of a nucleotide?
 - a. adenine—deoxyribose—phosphate
 - b. adenine—ribose—phosphate
 - c. cytosine—deoxyribose—phosphate
 - d. guanine—deoxyribose—phosphate
- _____ 5. The percentage of adenine in DNA is
 - a. equal to the percentage of cytosine.
 - b. equal to the percentage of thymine.
 - c. not related to the percentage of thymine.
 - d. equal to the percentage of guanine.

SHORT ANSWER Answer the questions in the space provided.

1. What are the three parts of a DNA nucleotide, and how are they connected to each other?

2. If 15% of the nucleotides in a DNA molecule contain guanine, what percentage of the nucleotides contain each of the other three bases? Explain your reasoning.

3. Why is complementary base pairing important in DNA structure?

4. **Critical Thinking** How did X-ray diffraction photographs help Watson and Crick determine the structure of DNA?

STRUCTURES AND FUNCTIONS Label each part of the figure in the spaces provided.

The diagram below shows two nucleotide base pairs in a segment of a DNA molecule.

