

Chapter 12 DNA and RNA Section Review 12-1

Reviewing Key Concepts

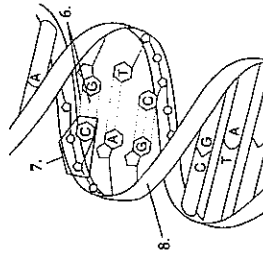
Matching On the lines provided, match the letter of the scientist(s) with the description of his or their conclusions.

- a. Griffith
 - b. Avery
 - c. Hershey and Chase
1. concluded that the genetic material of a bacteriophage is DNA _____
 2. concluded that DNA was the factor that caused one bacterium to transform into another _____
 3. concluded that bacteria could be transformed from harmless to disease-causing by an unknown factor _____

Completion On the lines provided, complete the following sentences.

4. The structure of a DNA molecule can be described as a _____.
5. The structure of DNA was discovered by _____ and _____.

Interpreting Graphics On the lines corresponding to the numbers on the diagram, identify the following parts of the DNA molecule: hydrogen bonds, nucleotide, sugar-phosphate backbone.



6. _____
7. _____
8. _____

Reviewing Key Skills

9. Using Analogies A double helix looks like a twisted ladder. Which parts of a twisted ladder are analogous to the hydrogen bonds and sugar-phosphate backbones of a double helix of DNA? _____
10. Calculating Use Chargaff's rules to determine the approximate percentage of thymine in a DNA molecule, if 28% of the nucleotides in the molecule contain adenine. _____

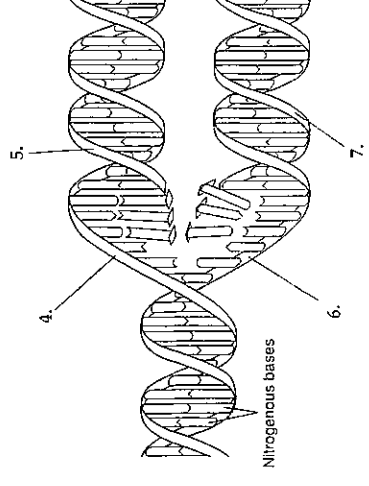
Chapter 12 DNA and RNA Section Review 12-2

Reviewing Key Concepts

Completion On the lines provided, choose the words that correctly complete the following sentences.

1. During DNA replication, the DNA molecule _____ (separates/combines) into two strands.
2. At the end of DNA replication, _____ (four/two) new strands of DNA have been produced, giving a total of _____ (four/six) strands of DNA.
3. New DNA is replicated in strands complementary to old DNA because production of new DNA follows the rules of _____ (base pairing/the double helix).

Identifying Structures On the lines corresponding to the numbers on the diagram, write whether the strand pointed to is an original strand or a new strand.



4. _____
5. _____
6. _____
7. _____

Reviewing Key Skills

8. Hypothesizing The length of a bacterium's DNA may be 1,000 times the length of the cell within which it is contained. Suggest an explanation for how this can occur. _____
9. Comparing and Contrasting How does the structure of a eukaryotic chromosome during mitosis differ from its structure during the rest of the cell cycle? _____

SECTION 10-1 REVIEW

DNA

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

1. purine _____
2. pyrimidine _____
3. complementary base pair _____
4. nitrogen-containing 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. During DNA replication, the enzyme DNA polymerase _____
 - a. separates the two nucleotide chains in a DNA molecule.
 - b. constructs new nucleotide chains that are complementary to the chains in the original DNA molecule.
 - c. breaks down the original DNA molecule into individual nucleotides.
 - d. joins two DNA molecules into a single molecule.
5. If the sequence of nucleotides in one chain of a DNA molecule is T-C-A-A-G-C, a new nucleotide chain will be produced during replication with the complementary sequence _____
 - a. T-C-A-A-G-C.
 - b. A-G-T-T-C-C.
 - c. C-T-G-G-A-T.
 - d. G-A-C-C-T-A.

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 it important that exact copies of DNA are produced during replication? _____
4. **Critical Thinking** Why is it advantageous to have weak hydrogen bonds between complementary base pairs and strong covalent bonds between phosphate and deoxyribose groups in a DNA molecule? _____

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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.

