

SECTION 10-1 REVIEW

DNA

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

1. purine _____

2. pyrimidine _____

3. complementary base pairing _____

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 the 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-G
 - 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?

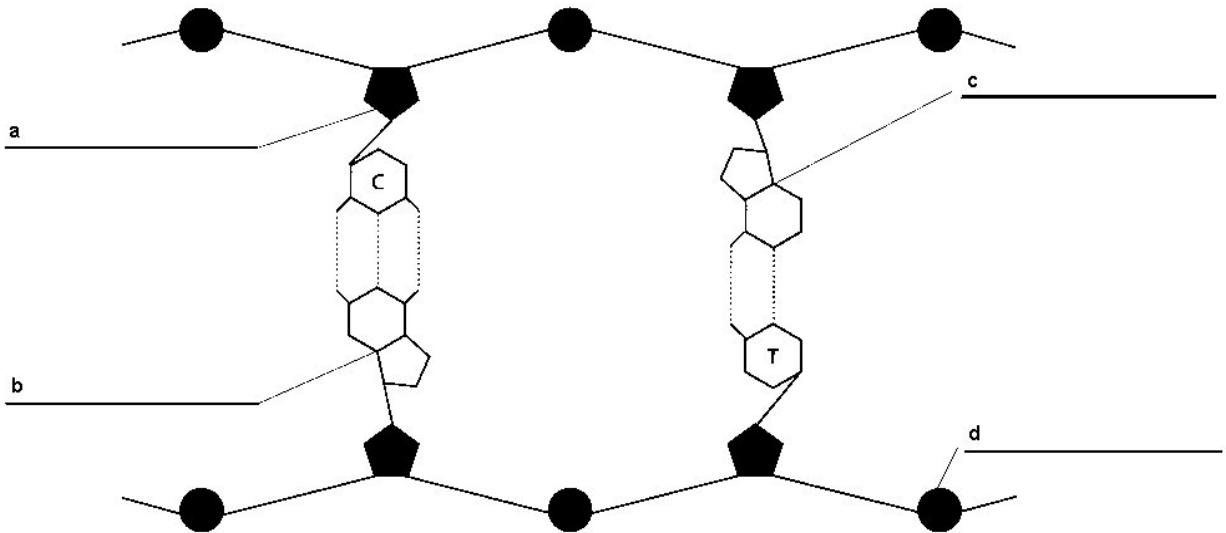
2. If 15% of the nucleotides in a DNA molecule contain guanine, what percentage of the nucleotides contain each of the other three bases? Explain your reasoning. _____

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 deoxyribose groups in a DNA molecule? _____

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.



SECTION 10-2 REVIEW

RNA

VOCABULARY REVIEW Define the following terms.

1. messenger RNA _____

2. transfer RNA _____

3. transcription _____

4. promoter _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. Ribose is a type of

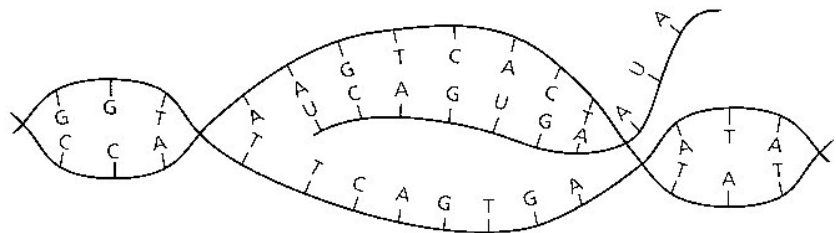
a. nitrogen-containing base	c. sugar
b. amino acid	d. enzyme
- _____ 2. In RNA, thymine is replaced by

a. adenine	b. guanine	c. cytosine	d. uracil
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- _____ 3. The type of RNA that carries the instructions for making a protein is called

a. mRNA	b. pRNA	c. rRNA	d. tRNA
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- _____ 4. In eukaryotic cells, RNA is copied from DNA in the

a. ribosomes	b. nucleus	c. nuclear membrane	d. cytosol
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- _____ 5. What process is shown in the diagram below?

a. proofreading	b. protein synthesis
c. replication	d. transcription



SHORT ANSWER Answer the questions in the space provided.

1. Describe three ways that RNA differs from DNA. _____

2. Describe the shapes of the three types of RNA. _____

3. How is information about making proteins transmitted from the DNA to the site of protein synthesis?

4. What would be the nucleotide sequence of the RNA that is transcribed from DNA with a nucleotide sequence of G-C-T-A-A-T-C-C-G? _____
5. **Critical Thinking** How would the transcription of a eukaryotic gene be affected if a replication error changed the nucleotide sequence of the termination signal for that gene? _____

STRUCTURES AND FUNCTIONS Arrange the following steps in transcription in the correct order by writing the numbers 1 - 5 in the spaces before the steps.

- _____ a. RNA polymerase attaches to the first DNA nucleotide of the template chain.
- _____ b. RNA polymerase binds to the promoter on the template chain of DNA.
- _____ c. RNA polymerase reaches the termination signal and releases the DNA and RNA molecules.
- _____ d. The two chains of the DNA molecule separate near the promoter.
- _____ e. Complementary RNA nucleotides are added to the newly forming RNA molecule.

SECTION 10-3 REVIEW

PROTEIN SYNTHESIS

VOCABULARY REVIEW Define the following terms.

1. codon _____

2. translation _____

3. anticodon _____

MULTIPLE CHOICE Write the correct letter in the blank.

- _____ 1. A protein is a polymer consisting of a specific sequence of
 - a. amino acids.
 - b. fatty acids.
 - c. RNA nucleotides.
 - d. DNA nucleotides.
- _____ 2. The genetic code specifies the correlation between
 - a. a DNA nucleotide sequence and an RNA nucleotide sequence.
 - b. an mRNA nucleotide sequence and a tRNA nucleotide sequence.
 - c. an mRNA nucleotide sequence and an rRNA nucleotide sequence.
 - d. a nucleic acid sequence and an amino acid sequence.
- _____ 3. During translation, one end of a tRNA molecule pairs with a complementary
 - a. nucleotide sequence in DNA.
 - b. mRNA codon.
 - c. tRNA molecule.
 - d. protein molecule.
- _____ 4. One binding site on a ribosome holds an mRNA molecule, and the other two binding sites hold
 - a. two other ribosomes.
 - b. DNA.
 - c. tRNA molecules.
 - d. rRNA molecules.
- _____ 5. Two amino acids are linked by a peptide bond when
 - a. two ribosomes attach simultaneously to the same mRNA transcript.
 - b. two RNAs pair with neighboring codons on an mRNA transcript.
 - c. two codons on an mRNA transcript bind to each other.
 - d. a ribosome attaches to two codons on an mRNA transcript.

SHORT ANSWER Answer the questions in the space provided.

1. List, in order, the tRNA anticodons that are complementary to the mRNA sequence

AUGCAUGCAAGUUAG. _____

How many amino acids will be in the polypeptide that is initially formed when this mRNA sequence is translated?

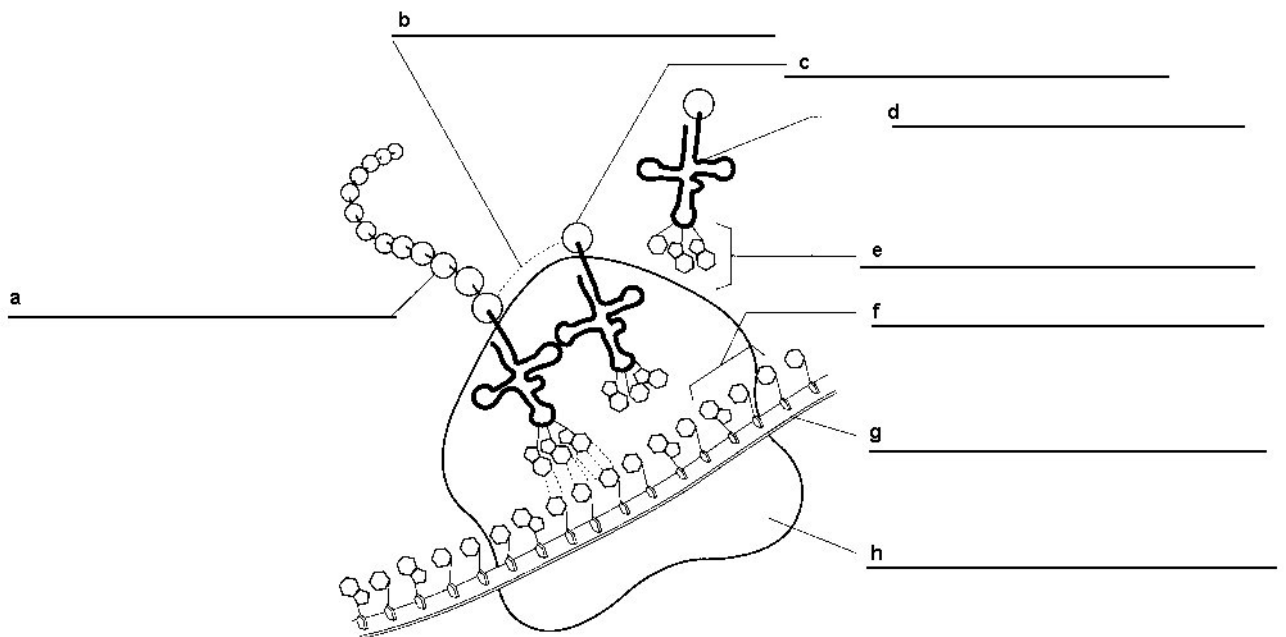
2. Explain why methionine is the first amino acid in every growing polypeptide. _____

3. What determines whether a protein is exported from a cell or used inside the cell? _____

4. **Critical Thinking** How would a deletion of one nucleotide in the middle of an mRNA transcript affect the polypeptide specified by the transcription? _____

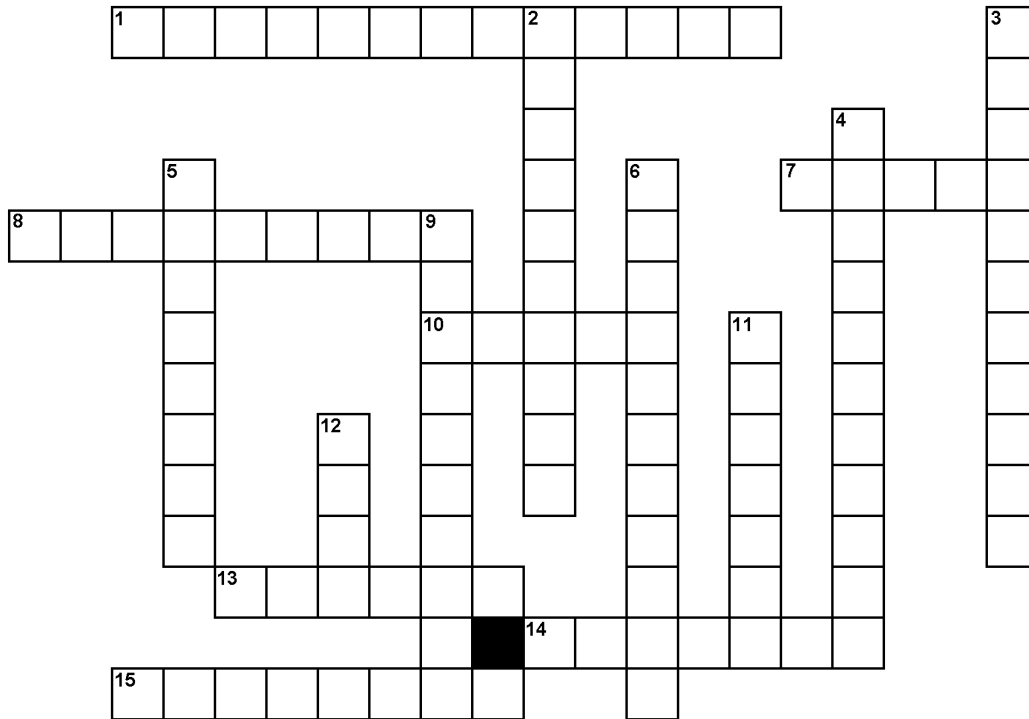
STRUCTURES AND FUNCTIONS Label each part of the figure in the spaces provided.

The diagram below summarizes the events that occur during translation.



VOCABULARY - CHAPTER 10

The crossword puzzle is a simple way to master some of the more important vocabulary terms in this chapter.



Across

1. process of creating a mRNA molecule
7. the shape of a DNA molecule is called a double _____
8. _____ group of three sequential bases for tRNA
10. group of three sequential bases of mRNA
13. substitutes for thymine in RNA
14. a polymer consisting of a specific sequence of amino acids
15. site where RNA polymerase binds to the beginning of a gene

Down

2. thymine and cytosine
3. sugar found in DNA
4. process that makes an identical copy of a DNA molecule
5. organelle where protein synthesis takes place
6. process that produces a protein by using complimentary base pairing with mRNA and tRNA
9. building block for DNA and RNA molecules
11. _____ bonds link amino acids together to form a protein
12. transports one specific type of amino acid to a ribosome

Name _____ Class _____ Date _____

LECTURE NOTES - CHAPTER 10