Chapter 11

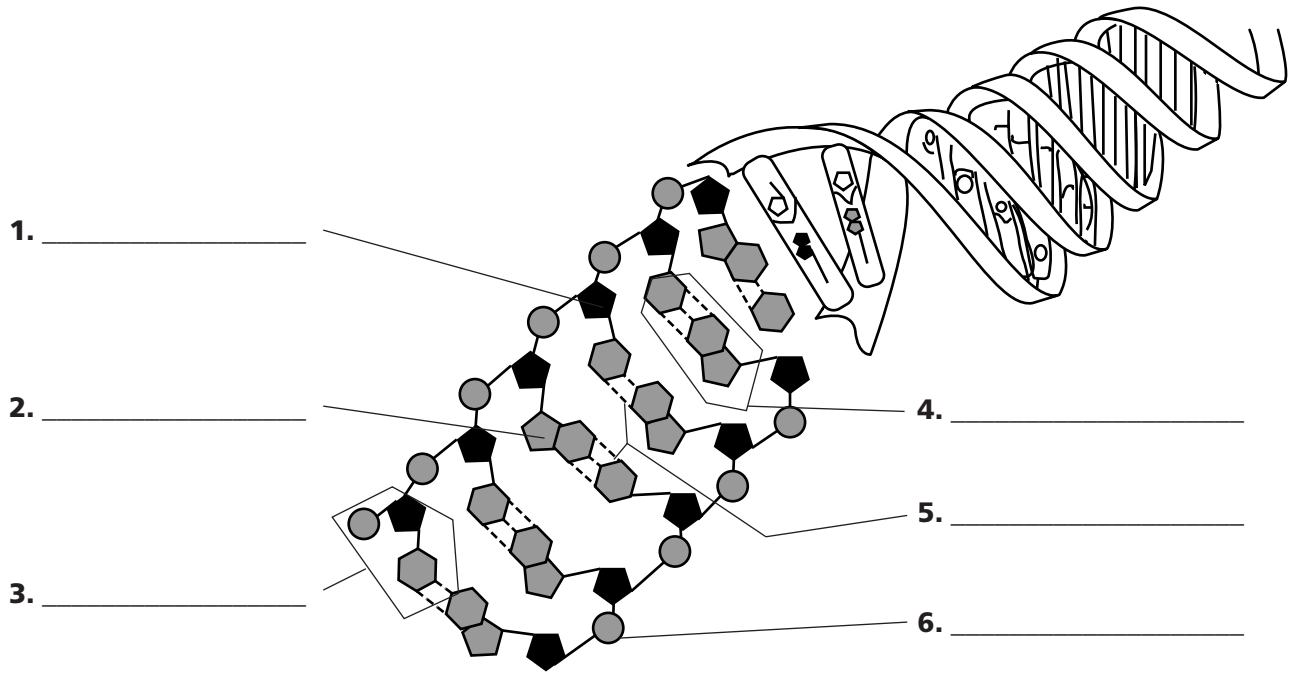
DNA and Genes

Reinforcement and Study Guide

Section 11.1 DNA: The Molecule of Heredity

In your textbook, read about what DNA is and the replication of DNA.

Label the diagram. Use these choices: nucleotide, deoxyribose, phosphate group, nitrogenous base, hydrogen bonds, base pair.



Complete each statement.

7. _____ , guanine (G), cytosine (C), and thymine (T) are the four _____ in DNA.

8. In DNA, _____ always forms hydrogen bonds with guanine (G).

9. The sequence of _____ carries the genetic information of an organism.

10. The process of _____ produces a new copy of an organism's genetic information, which is passed on to a new cell.

11. The double-coiled shape of DNA is called a _____ .

Chapter 11 **DNA and Genes,** *continued*

Reinforcement and Study Guide

Section 11.2 From DNA to Protein

In your textbook, read about genes and proteins and RNA.

Complete the chart on the three chemical differences between DNA and RNA.

Structure	DNA	RNA
1. strand of nucleotides	a.	b.
2. sugar	a.	b.
3. nitrogenous base	a.	b.

In your textbook, read about the genetic code.

Complete each statement.

4. Proteins are made up of _____ .

5. There are twenty different types of _____ .

6. The message of the DNA code is information for building _____ .

7. Each set of three nitrogenous bases that codes for an amino acid is known as a _____ .

8. The amino acid _____ is represented by the mRNA codon ACA.

9. _____ and _____ are mRNA codons for phenylalanine.

10. There can be more than one _____ for the same amino acid.

11. For any one codon, there can be only one _____ .

12. The genetic code is said to be universal because a codon represents the same _____ in almost all organisms.

13. _____ , _____ , and _____ are stop codons.

14. _____ and _____ are amino acids that are each represented by only one codon.

In your textbook, read about transcription from DNA to mRNA.

Complete each statement.

15. Proteins are made in the cytoplasm of a cell, whereas DNA is found only in the _____ .

16. The process of making RNA from DNA is called _____ .

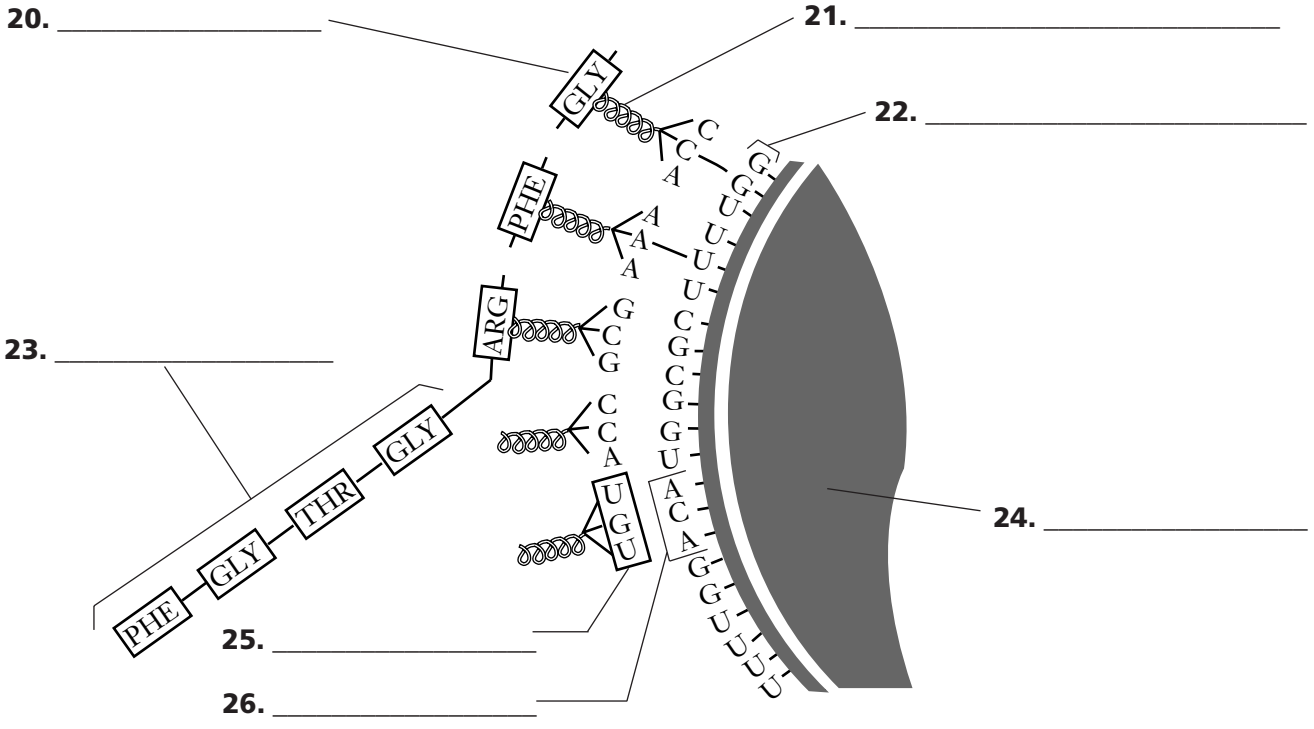
17. The process of transcription is similar to the process of DNA _____ .

18. _____ carries information from the DNA in the nucleus out into the cytoplasm of the cell.

19. mRNA carries the information for making proteins to the _____ .

In your textbook, read about translation from mRNA to protein.

Label the diagram. Use these choices: transfer RNA (tRNA), amino acid, amino acid chain, codon, anticodon, messenger RNA (mRNA), ribosome.



In your textbook, read about mutation—a change in DNA.

Circle the letter of the choice that best completes the statement.

1. A mutation is any mistake or change in the
a. cell. **b.** DNA sequence. **c.** ribosomes. **d.** nucleus.

2. A point mutation is a change in
a. several bases in mRNA. **b.** several bases in tRNA.
c. a single base pair in DNA. **d.** several base pairs in DNA.

3. A mutation in which a single base is added to or deleted from DNA is called
a. a frame shift mutation. **b.** a point mutation. **c.** translocation. **d.** nondisjunction.

4. Chromosomal mutations are especially common in
a. humans. **b.** animals. **c.** bacteria. **d.** plants.

5. Few chromosome mutations are passed on to the next generation because
a. the zygote usually dies.
b. the mature organism is sterile.
c. the mature organism is often incapable of producing offspring.
d. all of the above.

6. When part of one chromosome breaks off and is added to a different chromosome, the result is a(n)
a. translocation. **b.** insertion. **c.** inversion. **d.** deletion.

7. Many chromosome mutations result when chromosomes fail to separate properly during
a. mitosis. **b.** meiosis. **c.** crossing over. **d.** linkage.

8. The failure of homologous chromosomes to separate properly is called
a. translocation. **b.** disjunction. **c.** nondisjunction. **d.** deletion.

9. Mutations that occur at random are called
a. spontaneous mutations. **b.** nonspontaneous mutations.
c. nonrandom mutations. **d.** environmental mutations.

10. An agent that can cause a change in DNA is called a(n)
a. zygote. **b.** inversion.
c. mutagen. **d.** mutation.

11. Mutations in body cells can sometimes result in
a. new species. **b.** cancer.
c. sterile offspring. **d.** hybrids.