Name _____ Class _____ Date _____

Section 12–2 Chromosomes and DNA Replication (pages 295–299)

This section describes how DNA is packaged to form chromosomes. It also tells how the cell duplicates its DNA before cell division.

DNA and Chromosomes (pages 295–296)

1. Circle the letter of the location of DNA in prokaryotic cells.
   a. nucleus **b.** mitochondria **c.** cytoplasm **d.** vacuole
2. Is the following sentence true or false? Most prokaryotes contain a single, circular DNA molecule. _____
3. Eurkaryotic DNA is generally located in the cell _____ in the form of a number of chromosomes.
4. Is the following sentence true or false? All organisms have the same number of chromosomes. _____
5. Is the following sentence true or false? The *E. coli* chromosome is longer than the diameter of an individual *E. coli* bacterium. _____
6. Circle the letter of each sentence that is true about chromosome structure.
   a. The DNA in eukaryotic cells is very loosely packed.
   b. Prokaryotic cells contain more DNA than eukaryotic cells.
   c. A human cell contains more than 1 meter of DNA.
   d. The DNA of the smallest human chromosome is nearly 10 times as long as many bacterial chromosomes.
7. Eukaryotic chromosomes contain both DNA and protein, packed together to form _____.
8. What are histones? _____
9. Why are individual chromosomes visible only during mitosis? _____
10. Is the following sentence true or false? Changes in chromatin structure and histone-DNA binding are associated with changes in gene activity. _____
11. What do nucleosomes do? _____

Name _____ Class _____ Date _____

DNA Replication (pages 297–299)

12. What occurs during the process of replication? _____

13. Complete the flowchart to describe the process of DNA replication.

The DNA molecule _____, or unzips, into two strands.

↓

Each strand serves as a(an) _____, or model, to produce the new strands.

↓

Two new _____ strands are produced, following the rules of _____.

14. Is the following sentence true or false? In eukaryotic chromosomes, DNA replication begins at a single point in the chromosome and proceeds in two directions. _____

15. The sites where DNA replication and separation occur are called _____.

16. What occurs when a molecule of DNA is "unzipped"? _____

17. What is the complementary strand of bases for a strand with the bases TACGTT? _____

18. Is the following sentence true or false? Each DNA molecule resulting from replication has one original strand and one new strand. _____

19. List two major roles of DNA polymerase in the process of DNA replication.
    a. _____
    b. _____

Reading Skill Practice

The illustrations in textbooks can help you better understand a difficult concept. Look at Figure 12–10 on page 297. List in order, beginning with DNA, the levels of organization of eukaryotic DNA to form chromosomes. Do your work on a separate sheet of paper.