

## 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.*

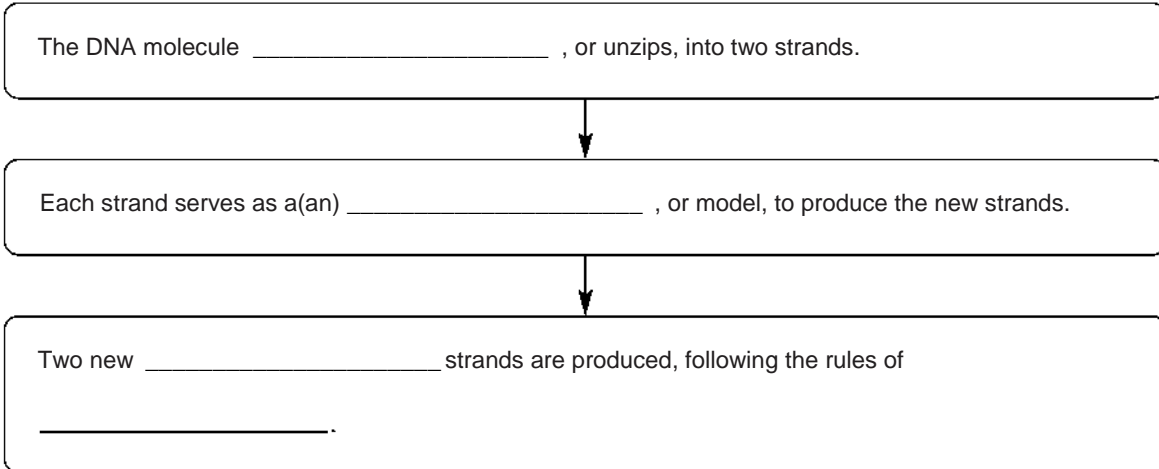
### DNA and Chromosomes (pages 295-296)

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. Eukaryotic 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? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### DNA Replication (pages 297-299)

12. What occurs during the process of replication? \_\_\_\_\_

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



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.