

# 10.2 The Process of Cell Division

## pg. 279-284

### Lesson Objectives

-  Describe the role of chromosomes in cell division.
-  Name the main events of the cell cycle.
-  Describe what happens during the four phases of mitosis.
-  Describe the process of cytokinesis.

### Chromosomes

*For Questions 1–5, complete each statement by writing the correct word or words.*

1. Cells carry genetic information in packages of DNA called \_\_\_\_\_.
2. Most \_\_\_\_\_ have only one circular strand of DNA.
3. In eukaryotic cells, the genetic structure consists of DNA and a tightly wound protein, which together form a substance called \_\_\_\_\_.
4. The beadlike structures formed by DNA wrapped around \_\_\_\_\_ molecules are called nucleosomes.
5. \_\_\_\_\_ make possible the precise separation of DNA during cell division.

### The Cell Cycle

6. What is the name of the type of cell division that occurs in the prokaryotic cell cycle?

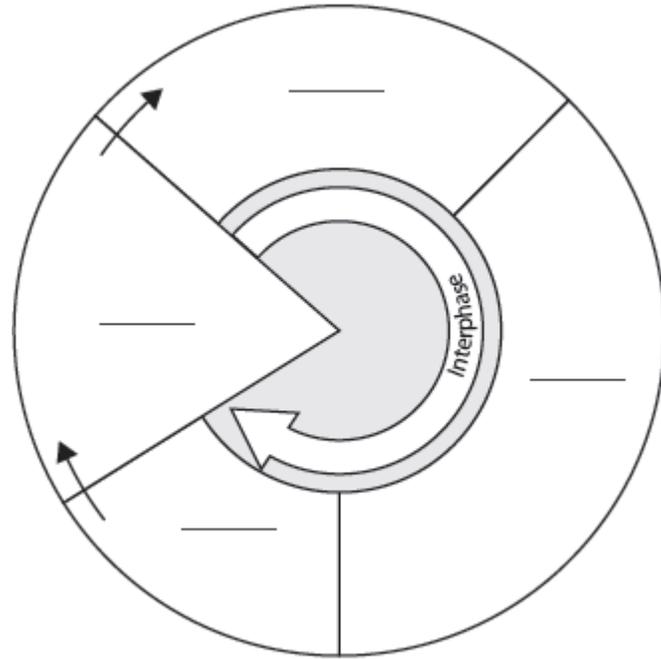
\_\_\_\_\_

7. What happens during interphase?

\_\_\_\_\_

\_\_\_\_\_

8. Complete the cell cycle diagram by writing the correct name of a phase on each line.



9. In eukaryotic cells, what happens in the G<sub>1</sub> phase that differs from the G<sub>2</sub> phase?

\_\_\_\_\_

10. In eukaryotic cells, what are the two main stages of cell division?

\_\_\_\_\_

## Mitosis

11. During prophase, when cell chromosomes become visible, what are the duplicated strands of DNA called? What is the name for the area in which these duplicated strands are joined?

\_\_\_\_\_  
\_\_\_\_\_

12. What structures are spindle fibers attached to that help pull the paired chromosomes apart?

\_\_\_\_\_  
\_\_\_\_\_

For Questions 13–16, match the description of the event with the phase of mitosis in which it occurs. Each phase may be used more than once.

**Event**

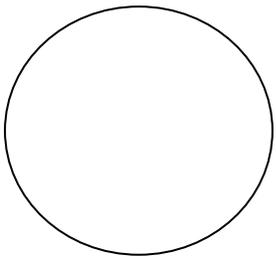
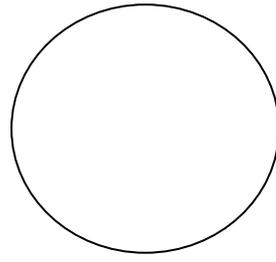
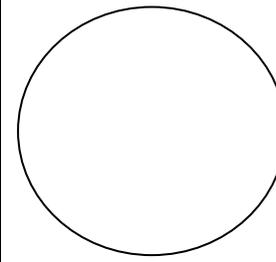
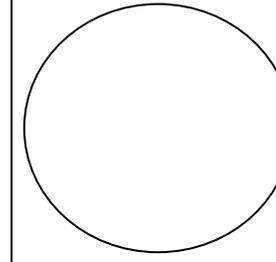
- \_\_\_\_\_ 13. The chromosomes separate and begin to move to opposite sides of the cell.
- \_\_\_\_\_ 14. The chromosomes become visible. The centrioles take up positions on opposite sides of the nucleus.
- \_\_\_\_\_ 15. A nuclear envelope re-forms around each cluster of chromosomes. The nucleolus becomes visible in each daughter nucleus.
- \_\_\_\_\_ 16. The chromosomes line up across the center of the cell.

**Phase of Mitosis**

- A. Telophase
- B. Prophase
- C. Metaphase
- D. Anaphase

**THINK VISUALLY**

17. The four circles below represent the nucleus of a cell going through mitosis. Draw four chromosomes as they go through each phase. Label each phase and describe what is happening to the DNA.

				
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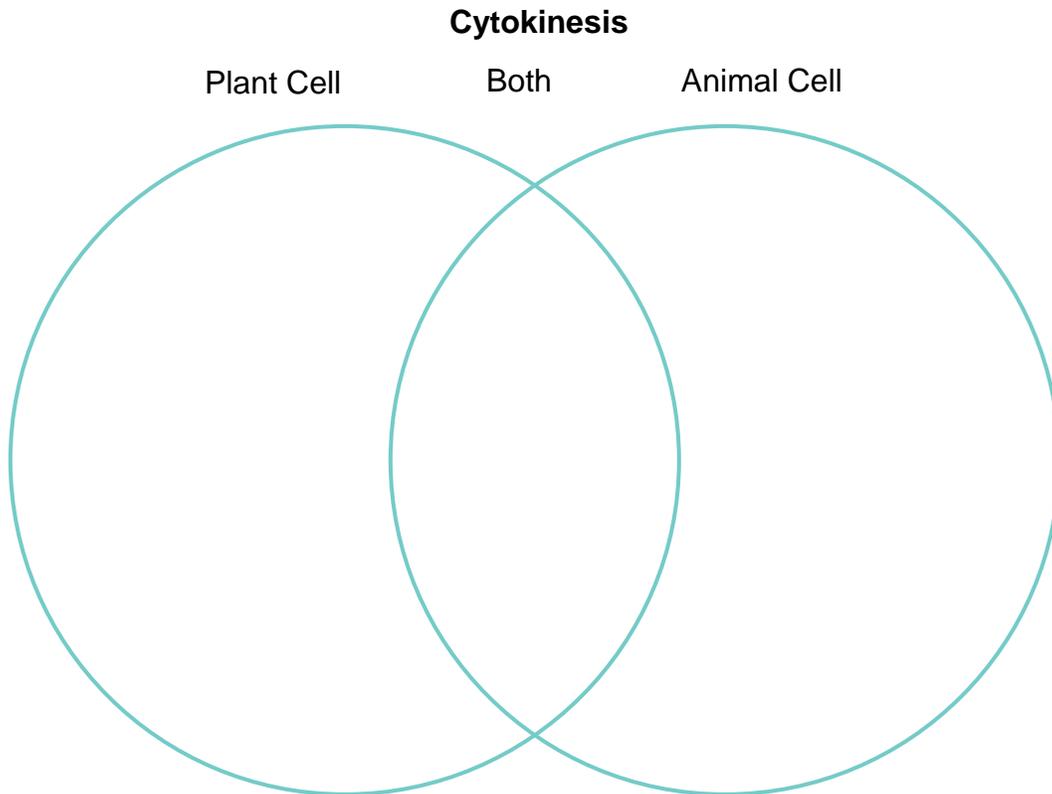
# Cytokinesis

18. What is cytokinesis?

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19. Use the Venn diagram to compare and contrast cytokinesis in animal cells with cytokinesis in plant cells.



20. During certain stages of their life cycle, some cells repeatedly undergo mitosis but do not undergo cytokinesis. What would you expect to see if you looked at such cells, or a tissue made up of such cells, under a microscope? Explain your answer.

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