

**Chapter 10****Cell Growth and Division****Section 10–1 Cell Growth (pages 241–243)**

*This section explains what problems growth causes for cells.*

**Limits to Cell Growth (pages 241–243)**

1. What are two reasons why cells divide rather than continue to grow indefinitely?
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
2. Is the following sentence true or false? As a cell increases in size, it usually makes extra copies of its DNA. \_\_\_\_\_
3. Circle the letter of what determines the rate at which food and oxygen in a cell are used up and waste products produced.
  - a. The cell's organelles
  - b. The cell's volume
  - c. The cell's location
  - d. The cell's DNA
4. How can you obtain a cell's ratio of surface area to volume? \_\_\_\_\_
5. If a cell's surface area is  $6 \text{ cm}^3$  and its volume is  $1 \text{ cm}^3$ , then what is its ratio of surface area to volume? \_\_\_\_\_
6. Is the following sentence true or false? As a cell grows in size, its volume increases much more rapidly than its surface area.  
\_\_\_\_\_
7. Circle the letter of what happens to a cell's ratio of surface area to volume as the cell's volume increases more rapidly than its surface area.
  - a. The ratio decreases.
  - b. The ratio increases.
  - c. The ratio remains the same.
  - d. The ratio disappears.
8. What is cell division? \_\_\_\_\_
9. How does cell division solve the problem of increasing size? \_\_\_\_\_

## Chapter 10, Cell Growth and Division *(continued)*

### Section 10–2 Cell Division (pages 244–249)

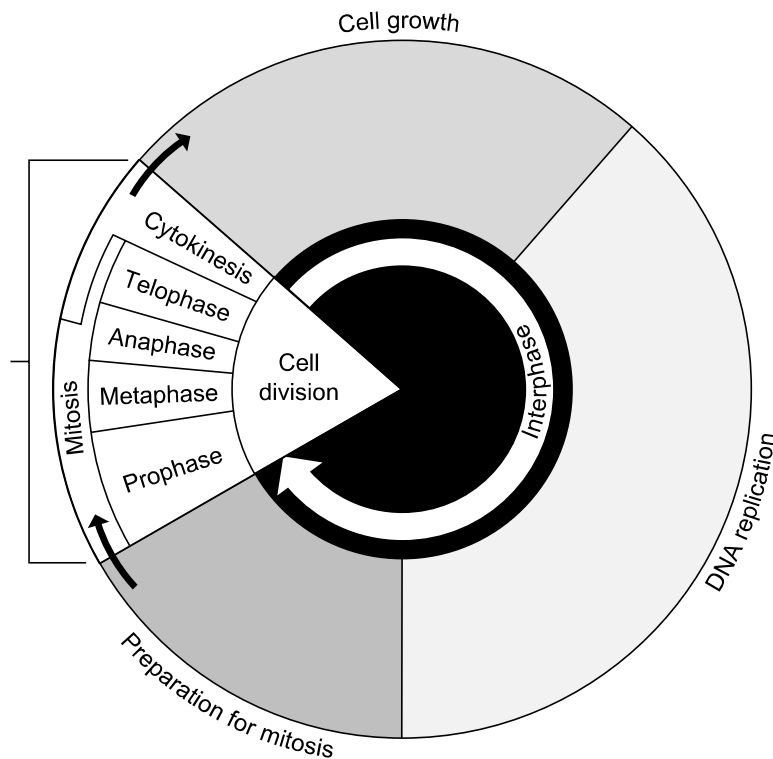
*This section describes the main events of the cell cycle. It also explains what happens during mitosis, when cell division occurs.*

#### Chromosomes (page 244)

1. Is the following sentence true or false? Chromosomes are not visible in most cells except during cell division.  
\_\_\_\_\_
2. When chromosomes become visible at the beginning of cell division, what does each chromosome consist of? \_\_\_\_\_  
\_\_\_\_\_
3. Each pair of chromatids is attached at an area called the \_\_\_\_\_.

#### The Cell Cycle (page 245)

4. The period of growth in between cell divisions is called \_\_\_\_\_.
5. What is the cell cycle? \_\_\_\_\_  
\_\_\_\_\_
6. Complete the diagram of the cell cycle by writing the names of each of the four phases.



7. The division of the cell nucleus during the M phase of the cell cycle is called \_\_\_\_\_.

### Events of the Cell Cycle (page 245)

8. Interphase is divided into what three phases?  
 a. \_\_\_\_\_ b. \_\_\_\_\_ c. \_\_\_\_\_
9. What happens during the G<sub>1</sub> phase? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
10. What happens during the S phase? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
11. What happens during the G<sub>2</sub> phase? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Mitosis (pages 246–248)

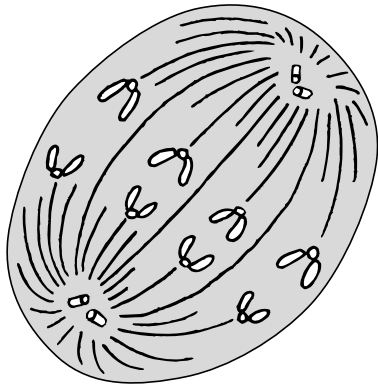
12. What are the four phases of mitosis?  
 a. \_\_\_\_\_ c. \_\_\_\_\_  
 b. \_\_\_\_\_ d. \_\_\_\_\_
13. Circle the letter of the name for the two tiny structures located in the cytoplasm near the nuclear envelope at the beginning of prophase.  
 a. centrioles c. centromeres  
 b. spindles d. chromatids
14. What is the spindle? \_\_\_\_\_  
 \_\_\_\_\_

*Match the description of the event with the phase of mitosis it is in. Each phase may be used more than once.*

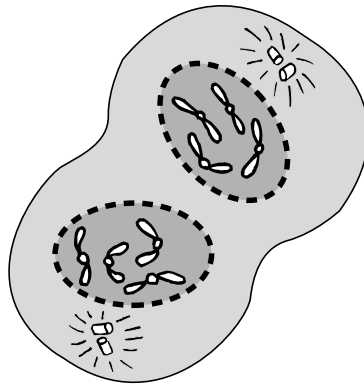
Event	Phase
_____ 15. The chromosomes move until they form two groups near the poles of the spindle.	a. Prophase
_____ 16. The chromosomes become visible.	b. Metaphase
_____ 17. A nuclear envelope re-forms around each cluster of chromosomes.	c. Anaphase
_____ 18. The centrioles take up positions on opposite sides of the nucleus.	d. Telophase
_____ 19. The chromosomes line up across the center of the cell.	
_____ 20. The nucleolus becomes visible in each daughter nucleus.	

## Chapter 10, Cell Growth and Division *(continued)*

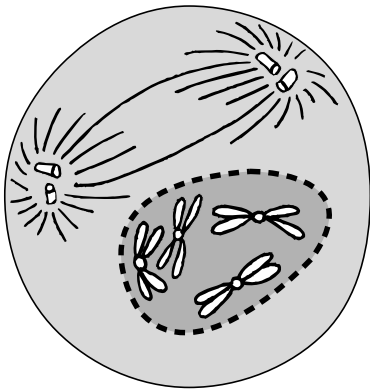
21. Identify each of the four phases of mitosis pictured below.



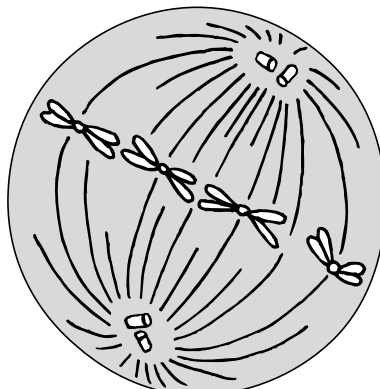
a. \_\_\_\_\_



c. \_\_\_\_\_



b. \_\_\_\_\_



d. \_\_\_\_\_

### Cytokinesis (page 248)

22. What is cytokinesis? \_\_\_\_\_

23. How does cytokinesis occur in most animal cells? \_\_\_\_\_

\_\_\_\_\_

24. Circle the letter of what forms midway between the divided nucleus during cytokinesis in plant cells.

a. cell nucleus

c. cell plate

b. cytoplasm

d. cytoplasmic organelles

### Reading Skill Practice

You may sometimes forget the meanings of the vocabulary terms that were introduced earlier in the textbook. When this happens, you can check the meanings of the terms in the Glossary, which you can find at the end of the book just before the Index. Use the Glossary to review the meanings of all the vocabulary terms listed on page 244. Write their definitions on a separate sheet of paper.