

# Study Guide

## CHAPTER 7

### Section 1: Cell Discovery and Theory

In your textbook, read about the history of the cell theory and microscope technology.

Respond to each statement.

1. **Name** the invention that helped scientists discover the cell.

\_\_\_\_\_

2. **Tell** why Hooke called the structures he saw in the cork *cellulae* (“small rooms”).

\_\_\_\_\_

\_\_\_\_\_

3. **Name** the type of microscope that uses a series of magnifying lenses.

\_\_\_\_\_

Write the term or phrase that best completes each statement. Use these choices:

**cell theory      cells      daughter cells      genetic material      organisms**

The (4) \_\_\_\_\_ includes the following three principles:

1. All living organisms are composed of one or more (5) \_\_\_\_\_.
2. Cells are the basic unit of structure and organization of all living (6) \_\_\_\_\_.
3. Cells arise only from previously existing cells, with cells passing copies of their (7) \_\_\_\_\_ on to their (8) \_\_\_\_\_.

In your textbook, read about basic cell types.

Complete the table by checking the correct column(s) for each description.

Description	Prokaryotes	Eukaryotes
9. Organisms that break down molecules to generate energy		
10. Organisms that have cells lacking internal membrane-bound organelles		
11. Organisms whose cells do not have nuclei		
12. Organisms that are either unicellular or multicellular		
13. Organisms that are generally unicellular		
14. Organisms that have cells containing organelles		
15. Organisms that have plasma membranes		

# INTRODUCTION TO THE CELL

---

---


## VOCABULARY REVIEW Define the following terms.

1. organelle \_\_\_\_\_  
\_\_\_\_\_
2. nucleus \_\_\_\_\_  
\_\_\_\_\_
3. eukaryote \_\_\_\_\_  
\_\_\_\_\_
4. prokaryote \_\_\_\_\_  
\_\_\_\_\_

## MULTIPLE CHOICE Write the correct letter in the blank.

- \_\_\_\_\_ 1. One early piece of evidence supporting the cell theory was the observation that
  - a. only plants are composed of cells.
  - b. only animals are composed of cells.
  - c. cells come from other cells.
  - d. animal cells come from plant cells.
  
- \_\_\_\_\_ 2. Cells are limited in size by the
  - a. rate at which substances needed by the cell can enter the cell through its surface.
  - b. rate at which the cell can manufacture genetic information.
  - c. amount of material the cell can collect to fill itself.
  - d. amount of cell membrane the cell can produce.
  
- \_\_\_\_\_ 3. The characteristic of a nerve cell that relates directly to its function in receiving and transmitting nerve impulses is its
  - a. long extensions.
  - b. flat shape.
  - c. ability to change shape.
  - d. ability to engulf and destroy bacteria.
  
- \_\_\_\_\_ 4. One difference between eukaryotic and prokaryotic cells is that only
  - a. prokaryotic cells are surrounded by a cell membrane.
  - b. prokaryotic cells have a nucleus.
  - c. eukaryotic cells have genetic information.
  - d. eukaryotic cells have membrane-bound organelles.

**SHORT ANSWER** Answer the questions in the space provided.

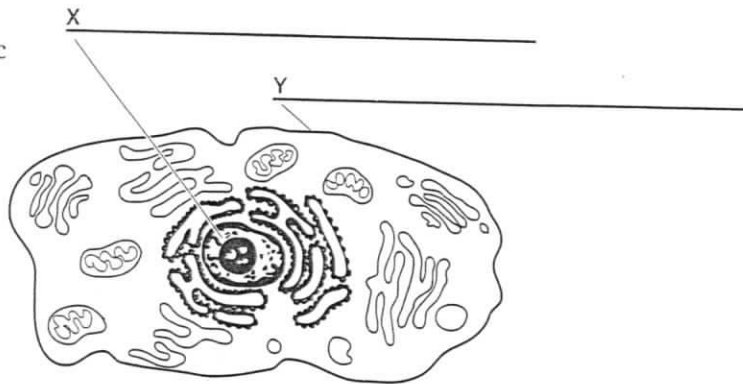
1. State the three parts of the cell theory. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
2. How does the ability of a white blood cell to change its shape affect its function? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
3. How are the organelles of a single cell like the organs of a multicellular organism? \_\_\_\_\_  
\_\_\_\_\_
4. Name two features of eukaryotic cells that prokaryotic cells lack. \_\_\_\_\_  
\_\_\_\_\_
5. **Critical Thinking** When a spherical cell increases in diameter from  $2\ \mu\text{m}$  to  $20\ \mu\text{m}$ , by what factor does its surface area change? By what factor does its volume change? (The surface area of a sphere =  $4\pi\ \text{radius}^2$ , and the volume of a sphere =  $\frac{4}{3}\pi\ \text{radius}^3$ . Remember that diameter =  $2 \times$  radius.)  
*Skip this one* 

**STRUCTURES AND FUNCTIONS**

1. These figures represent a eukaryotic cell and a prokaryotic cell. In the spaces below the diagrams, indicate which type of cell each diagram represents.



a \_\_\_\_\_



b \_\_\_\_\_

2. List two features that formed the basis for your identification of these cells.  
\_\_\_\_\_  
\_\_\_\_\_
3. Identify the structures labeled X and Y. \_\_\_\_\_