

## CHAPTER 1

# CELLS: THE BUILDING BLOCKS OF LIFE

### SECTION 1-1 What Is Life? (pages 18-25)

This section explains the characteristics of living things and what living things need to survive.

#### ► The Characteristics of Living Things (pages 18-21)

1. What is an organism? \_\_\_\_\_  
\_\_\_\_\_
2. List six characteristics that all living things share.
  - a. \_\_\_\_\_
  - b. \_\_\_\_\_
  - c. \_\_\_\_\_
  - d. \_\_\_\_\_
  - e. \_\_\_\_\_
  - f. \_\_\_\_\_
3. The basic building blocks of all organisms are \_\_\_\_\_.
4. Is the following sentence true or false? Most cells can be seen only with a microscope, a tool that magnifies small objects. \_\_\_\_\_
5. Is the following sentence true or false? An organism made of many cells is a unicellular organism. \_\_\_\_\_
6. Circle the letter of the most abundant chemical in cells.
  - a. proteins
  - b. carbohydrates
  - c. water
  - d. nucleic acids
7. Lipids and \_\_\_\_\_ are the building materials of cells.
8. Is the following sentence true or false? The cells of organisms use energy for growth and repair. \_\_\_\_\_

**CHAPTER 1, Cells: The Building Blocks of Life** (continued)

9. What is development? \_\_\_\_\_  
\_\_\_\_\_

10. Circle the letter of a change in an organism's surroundings that causes the organism to react.  
a. growth      b. response      c. stimulus      d. development

11. Give one example of a stimulus and one example of a response.

Stimulus: \_\_\_\_\_

Response: \_\_\_\_\_

12. All organisms can \_\_\_\_\_, or produce offspring that are similar to the parents.

► **Life Comes From Life** (pages 21–22)

13. Is the following sentence true or false? Frogs can sprout from mud in ponds. \_\_\_\_\_

14. The idea that living things can come from nonliving sources is called \_\_\_\_\_.

15. What did Francesco Redi show in his experiment? \_\_\_\_\_  
\_\_\_\_\_

16. The factor that a scientist changes in a controlled experiment is the \_\_\_\_\_.

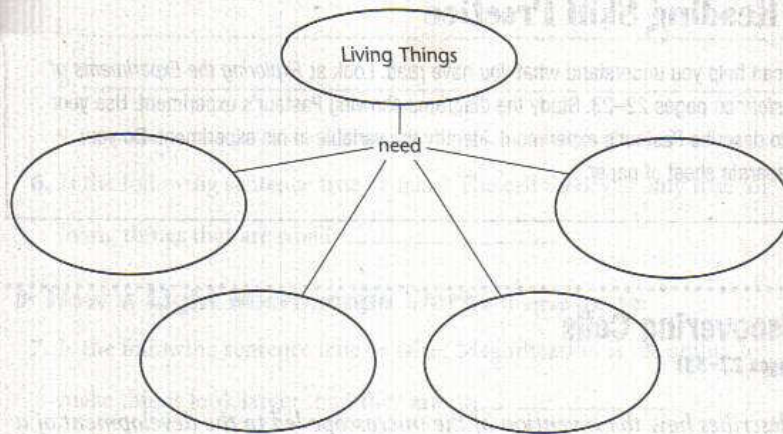
17. Look at *Exploring the Experiments of Redi and Pasteur* on pages 22–23. Circle the letter of the manipulated variable in Redi's experiment.

a. meat      b. jars      c. cloth      d. flies

18. Is the following sentence true or false? Louis Pasteur used a controlled experiment to show that bacteria arise from spontaneous generation.

► **The Needs of Living Things** (pages 22–25)

19. Complete this concept map to show what living things need to survive.



20. Is the following sentence true or false? Living things use food as their energy source to carry out their life functions. \_\_\_\_\_

21. Organisms that make their own food are called \_\_\_\_\_.  
Organisms that cannot make their own food are called \_\_\_\_\_.

22. Is the following sentence true or false? Living things can live without water for long periods of time. \_\_\_\_\_

23. What property of water makes it vital to living things? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

24. Is the following sentence true or false? Organisms must compete with each other for space to live. \_\_\_\_\_

25. Why must living things have homeostasis, or stable internal conditions?  
\_\_\_\_\_  
\_\_\_\_\_

**CHAPTER 1, Cells: The Building Blocks of Life** (continued)



## Reading Skill Practice

Illustrations can help you understand what you have read. Look at *Exploring the Experiments of Redi and Pasteur* on pages 22–23. Study the diagrams showing Pasteur's experiment. Use your own words to describe Pasteur's experiment. Identify the variable in his experiment. Do your work on a separate sheet of paper.

**SECTION**  
**1-2**

## Discovering Cells

(pages 27–33)

This section describes how the invention of the microscope led to the development of a theory on cells. The section also explains how a light microscope works.

### ► First Sightings of Cells (pages 28–29)

1. An instrument that makes small objects look larger is a(n) \_\_\_\_\_.
2. Is the following sentence true or false? A compound microscope has only one lens. \_\_\_\_\_
3. Complete the following table about the first people to observe cells.

The First People to Observe Cells		
Questions	Robert Hooke	Anton van Leeuwenhoek
What kind of microscope did he use?		
What did he first look at with the microscope?		
What did he name what he saw?		

4. Is the following sentence true or false? Theodor Schwann worked alone \_\_\_\_\_ to develop the cell theory. \_\_\_\_\_

NAME \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

**CHAPTER 1, Cells: The Building Blocks of Life** (continued)

**SECTION**  
**1-3** **Looking Inside Cells**  
(pages 34-42)

This section describes cell structure and function in plant cells, animal cells, and bacteria.

► **Introduction** (pages 34-35)

1. What are organelles? \_\_\_\_\_

► **Cell Wall** (page 35)

2. The rigid layer of nonliving material that surrounds plant cells is the \_\_\_\_\_.

3. Circle the letter of each sentence that is true about the cell wall.

- a. Cell walls are made of cellulose.
- b. Plant cells have cell walls.
- c. Animal cells have cell walls.
- d. Water and oxygen cannot pass through the cell wall.

► **Cell Membrane** (pages 35-36)

4. Where is the cell membrane located in cells that have cell walls?  
\_\_\_\_\_

5. Is the following sentence true or false? The main function of the cell membrane is to control what comes into and out of a cell. \_\_\_\_\_

► **Nucleus** (pages 36-37)

6. The cell's control center, which directs all of the cell's activities, is the \_\_\_\_\_.

7. Circle the letter of each sentence that is true about the nucleus.
- a. Materials move into the nucleus through pores in the nuclear membrane.
  - b. Chromatin contains the instructions that direct the functions of a cell.
  - c. The nucleolus is part of the nuclear membrane.
  - d. Ribosomes are made in the nucleolus.

► **Organelles in the Cytoplasm (pages 37-41)**

8. Circle the letter of the part of the cell that is the region between the cell membrane and the nucleus.
- a. organelle      b. nucleus      c. cytoplasm      d. chromatin
9. In the table below, describe the function of each organelle in the cytoplasm.

Organelles in Cytoplasm	
Organelle	Function
Mitochondria	
Endoplasmic reticulum	
Ribosomes	
Golgi bodies	
Chloroplasts	
Vacuoles	
Lysosomes	

**CHAPTER 1, Cells: The Building Blocks of Life** (continued)

► **Bacterial Cells** (page 41)

10. Circle the letter of each sentence that is true about bacterial cells.
- a. Bacterial cells are larger than plant or animal cells.
  - b. Bacterial cells have a cell wall and a cell membrane.
  - c. Bacterial cells do not have a nucleus.
  - d. Bacterial cells do not have genetic material.

► **Specialized Cells** (page 42)

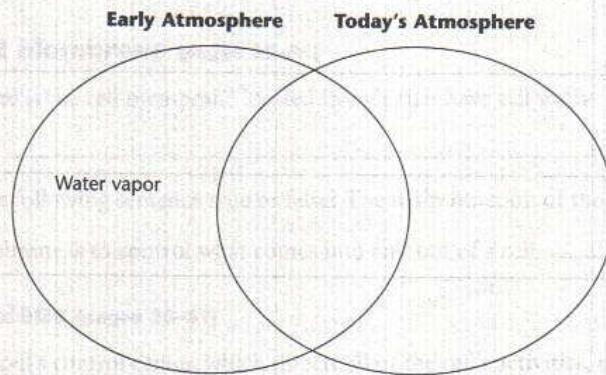
11. The structure of each kind of body cell is suited to its \_\_\_\_\_.

**SECTION 1-4** **The Origin of Life**  
(pages 44-46)

*This section describes how Earth's atmosphere formed and how scientists think life first appeared on Earth.*

► **Earth's Early Atmosphere** (pages 44-45)

1. Complete this Venn diagram to compare the major gases that made up Earth's early atmosphere and Earth's atmosphere today.



2. Is the following sentence true or false? Early life forms needed oxygen to survive. \_\_\_\_\_

Name \_\_\_\_\_

► **Life's Chemicals** (page 45)

3. Is the following sentence true or false? Scientists think that the first life forms on Earth probably did arise from nonliving materials.

\_\_\_\_\_

4. What materials did Harold Urey and Stanley Miller use to recreate the conditions of early Earth in their laboratory? \_\_\_\_\_

\_\_\_\_\_

5. Urey and Miller used an electric current in their experiment to simulate \_\_\_\_\_.

6. What were the results of Urey and Miller's experiment? \_\_\_\_\_

\_\_\_\_\_

► **The First Cells** (page 46)

7. Scientists think that the small chemical units of life formed gradually over millions of years in Earth's \_\_\_\_\_.

8. Traces of ancient organisms that have been preserved in rock or other substances are \_\_\_\_\_.

9. Circle the letter before each sentence that is true about how life formed on Earth.

a. Fossils show that bacteria-like living things were on Earth between 3.4 and 3.5 billion years ago.

b. The first cells probably used the chemicals in their surroundings for energy.

c. Cells that made their own food produced oxygen as a waste product, which built up in Earth's atmosphere.

d. Scientists know for certain how life first appeared on Earth.

**CHAPTER 1, Cells: The Building Blocks of Life** (continued)

**Word Wise**

Match each definition on the left with the correct term on the right. Then write the number of each term in the appropriate box below. When you have filled in all the boxes, add up the numbers in each column, row, and two diagonals. The sums should be the same. Some terms may not be used.

- |  |                  |
|--|------------------|
| 1. Acts as the cell's control center                     | 1. cytoplasm     |
| 2. Area between the cell membrane and the nucleus        | 2. stimulus      |
| 3. Trace of an ancient organism                          | 3. magnification |
| 4. A change in an organism's surroundings                | 4. autotroph     |
| 5. Basic unit of structure and function in living things | 5. prokaryote    |
| 6. Organism whose cell lacks a nucleus                   | 6. cell          |
| 7. Make things look larger than they are                 | 7. response      |
| 8. Genetic material in the nucleus                       | 8. nucleus       |
| 9. Organism that makes its own food                      | 9. fossil        |
|  | 10. resolution   |
|  | 11. chromatin    |
|  | 12. heterotroph  |

A _____	B _____	C _____	= _____
D _____	E _____	F _____	= _____
G _____	H _____	I _____	= _____
= _____	= _____	= _____	= _____

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