Chapter 1 Cells: The Building Blocks of Life

Study Guide

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        ii. Cellular Organization
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        ii. Robert Hooke
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        i. **Fossils**

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SECTION 1-1 **REVIEW AND REINFORCE**

What Is Life?

◆ Understanding Main Ideas

Answer the following questions on the back of this page or on a separate sheet of paper.

1. What are six characteristics all living things share?
2. How did Redi's experiment help disprove the idea of spontaneous generation?
3. What are the four basic needs all living things must satisfy?
4. Describe the difference between growth and development.

◆ Building Vocabulary

From the list below, choose the term that best completes each sentence.

autotrophs	heterotrophs	controlled experiment
unicellular	multicellular	organisms
spontaneous generation	homeostasis	stimulus
response	cell	reproduce
manipulated variable		

5. A change in an organism's environment that causes the organism to react is called a(n) _____.
6. Organisms that make their own food are _____.
7. _____ organisms are composed of many cells.
8. _____ is the mistaken idea that living organisms arise from non-living sources.
9. All living things are called _____.
10. The _____ is the basic unit of structure in an organism.
11. Organisms that get energy by consuming other organisms are _____.
12. An organism reacts to a stimulus with a(n) _____.
13. A(n) _____ is conducted by performing two tests that are identical except for one factor called the _____.
14. An organism's ability to maintain stable internal conditions is called _____.
15. To _____ is to produce offspring that are similar to the parents.
16. Bacteria, the most numerous organisms on Earth, are _____ organisms.

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SECTION 1-2 REVIEW AND REINFORCE

Discovering Cells

◆ Understanding Main Ideas

Fill in the blanks in the table below.

Discovering Cells

Scientist	Contribution
1.	One of the first people to observe cells
Leeuwenhoek	**2.**
3.	Concluded that all plants are made up of cells
Schwann	**4.**
5.	Proposed that all cells come from other cells

Answer the following questions on a separate sheet of paper.

6. Compare and contrast magnification and resolution.

7. State how an electron microscope differs from a light microscope.

8. Explain how cells are related to living things.

◆ Building Vocabulary

Match each term with its definition by writing the letter of the correct definition in the blank beside the term.

_____ **9.** microscope

_____ **10.** compound microscope

_____ **11.** cell theory

_____ **12.** magnification

_____ **13.** convex lens

_____ **14.** resolution

a. the ability to make things look larger than they are

b. a widely accepted explanation of the relationship between cells and living things

c. a light microscope that has more than one lens

d. any instrument that makes small objects look larger

e. the ability to distinguish the individual parts of an object

f. a curved lens that is thicker in the middle than at the edges

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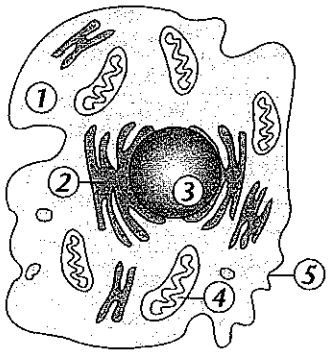
SECTION 1-3 **REVIEW AND REINFORCE**

Looking Inside Cells

◆ Understanding Main Ideas

Identify each of the cell structures in the figure.

Simplified Animal Cell



1. _____ 2. _____

3. _____ 4. _____

5. _____

◆ Building Vocabulary

Fill in the blank to complete each statement.

6. _____ are tiny cell structures that carry out specific functions within the cell.

7. The rigid layer of nonliving material that surrounds plant cells is called the _____.

8. In cells without cell walls, the _____ forms the outside boundary that separates the cell from its environment.

9. The _____ is a large, oval structure that directs all of the cell's activities.

10. Strands of genetic material floating in the nucleus are referred to as _____.

11. The region between the cell membrane and the nucleus is called the _____.

12. _____ produce most of the energy the cell needs to carry out its functions.

13. A maze of passageways called the _____ carries proteins and other materials from one part of the cell to another.

14. _____ function as factories to produce proteins.

15. _____ receive proteins and other newly formed materials and distribute them to other parts of the cell.

16. Organelles called _____ capture energy from sunlight and use it to produce food for the cell.

17. The storage area of a cell is called a(n) _____.

18. _____ are small, round structures in cells that break down large food particles into smaller ones.

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SECTION 1-4 REVIEW AND REINFORCE

The Origin of Life

◆ Understanding Main Ideas

Answer the following questions in the spaces provided.

1. A geologist claims to have found a sealed chamber below the Earth's surface. The chamber reportedly contains air that is over 3.6 billion years old. How would such air be different from the air you breathe today? How would it be similar?

2. Scientists think that the first life forms probably arose from nonliving materials. Explain how Urey and Miller's experiment supports this theory.

3. What do scientists think were the characteristics of the first life forms?

4. Explain how scientists think that oxygen accumulated in the Earth's atmosphere.

◆ Building Vocabulary

Write an answer for the following question in the space provided.

5. What are fossils? How are hypotheses about Earth's earliest life forms consistent with fossil evidence?

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Choose the letter of the correct answer.

1. Which of the following statements is NOT part of the cell theory?
   [A] Only animals are composed of cells.
   [B] All cells are produced from other cells.
   [C] Cells are the basic unit of structure and function in living things.
   [D] All living things are composed of cells.

2. Cells in many-celled organisms
   [A] are often quite different from one another.
   [B] are the same size in every part of the organism.
   [C] all have the same structure.
   [D] all look the same.

3. What is the function of a cell wall?
   [A] to prevent water from passing through it
   [B] to perform different functions in each cell
   [C] to prevent oxygen from entering the cell
   [D] to protect and support the cell

4. Which of the following is NOT a characteristic that all living things share?
   [A] movement [B] a cellular organization [C] using energy [D] reproduction

5. Which organelles found in plant and animal cells are also found in bacterial cells?
   [A] chloroplasts [B] ribosomes [C] endoplasmic reticulum [D] Golgi bodies

6. How does a microscope lens work?
   [A] The reflection of each concave lens makes the object appear larger.
   [B] Each convex lens bends light to make the object appear larger.
   [C] Each convex lens bends light to make the object become larger.
   [D] Each concave lens bends light to make the object appear larger.

7. Which organelles produce proteins in the cell?
   [A] chloroplasts [B] ribosomes [C] Golgi bodies [D] vacuoles

Choose the letter of the correct answer.

8. Which of these scientists was the first person to observe what are now called bacteria?

   [A] Robert Hooke [B] Rudolf Virchow

   [C] Matthias Schleiden [D] Anton von Leeuwenhoek

9. Which of the following statements is part of the cell theory?

   [A] Cells can be produced from nonliving matter.

   [B] Only plants are composed of cells.

   [C] All cells are produced from other cells.

   [D] Cells are one of several basic units of structure and function in living things.

10. What is the total magnification of a microscope with two lenses when one lens has a magnification of 15, and the other lens has a magnification of 30?

    [A] 450 [B] 30 [C] 15 [D] 45

11. A plant growing toward light is an example of

    [A] reproduction. [B] a response. [C] development. [D] a stimulus.

Fill in the word or phrase that best completes the statement(s).

12. The nucleus of a cell has thin strands of _____ that contain genetic material.

13. Organisms that make their own food are called _____.

14. Traces of ancient organisms that have been preserved in rock or other substances are known as _____.

15. Scientists think that the first life forms on Earth probably were unicellular heterotrophs, did not need oxygen to survive, and lived in Earth's _____.

16. The cell theory states that cells are the basic unit of structure and _____ in living things.

17. According to the cell theory, all organisms are made of _____.

18. The microscope allowed Hooke to see "tiny rectangular rooms," which he called _____.

Fill in the word or phrase that best completes the statement(s).

19. Most of today's organisms could not have lived on Earth 3.6 billion years ago because there was no _____ in the air then.

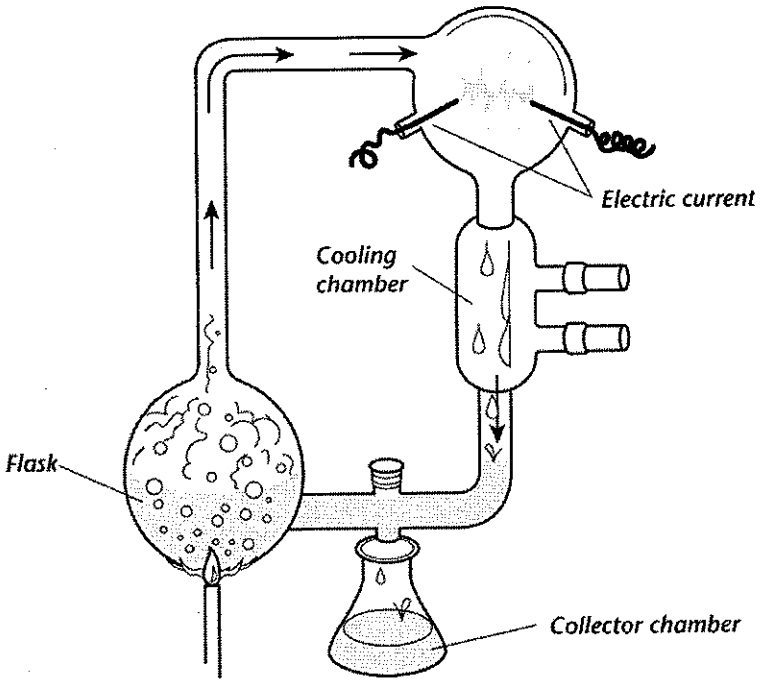
If the statement is true, write true. If it is false, change the underlined word or words to make the statement true.

20. Growth is the process of change that occurs during an organism's life to produce a more complex organism.

21. A horse is a heterotroph.

Use the diagram to answer the question(s).

The Equipment Used by Urey and Miller in Their Experiment

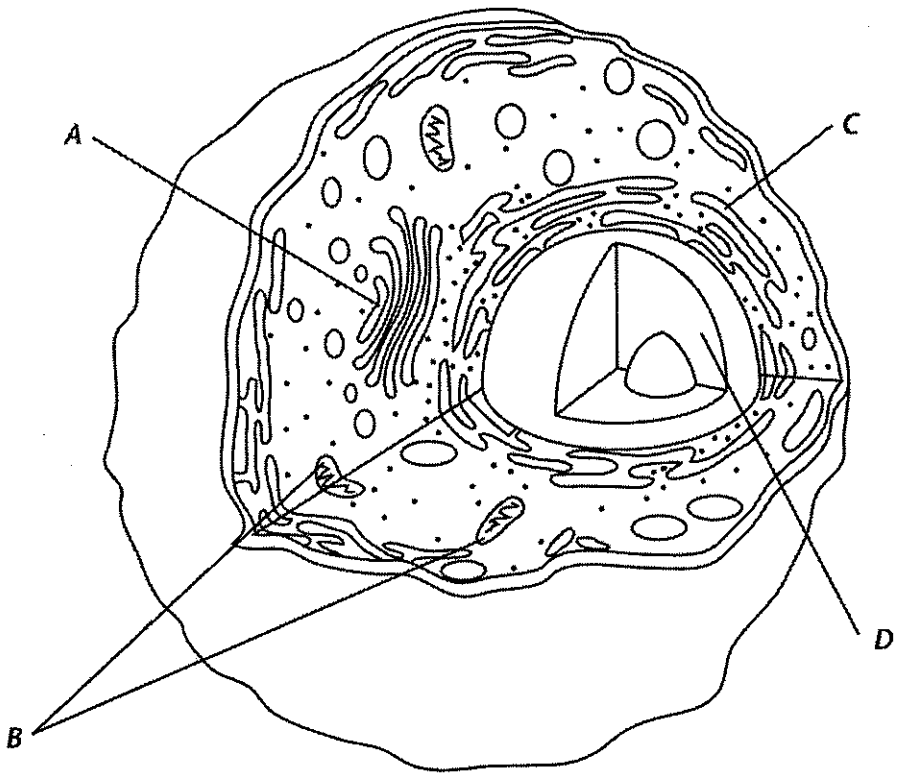


22. What did Urey and Miller place in the flask?

24. Why did Urey and Miller send an electric current through the mixture?

Use the diagram to answer the question(s).

Cell Structures



23. Identify structure C and describe its function.

25. Identify structure A and describe its function.

Write an answer to the following question(s).

26. Contrast mitochondria and chloroplasts.

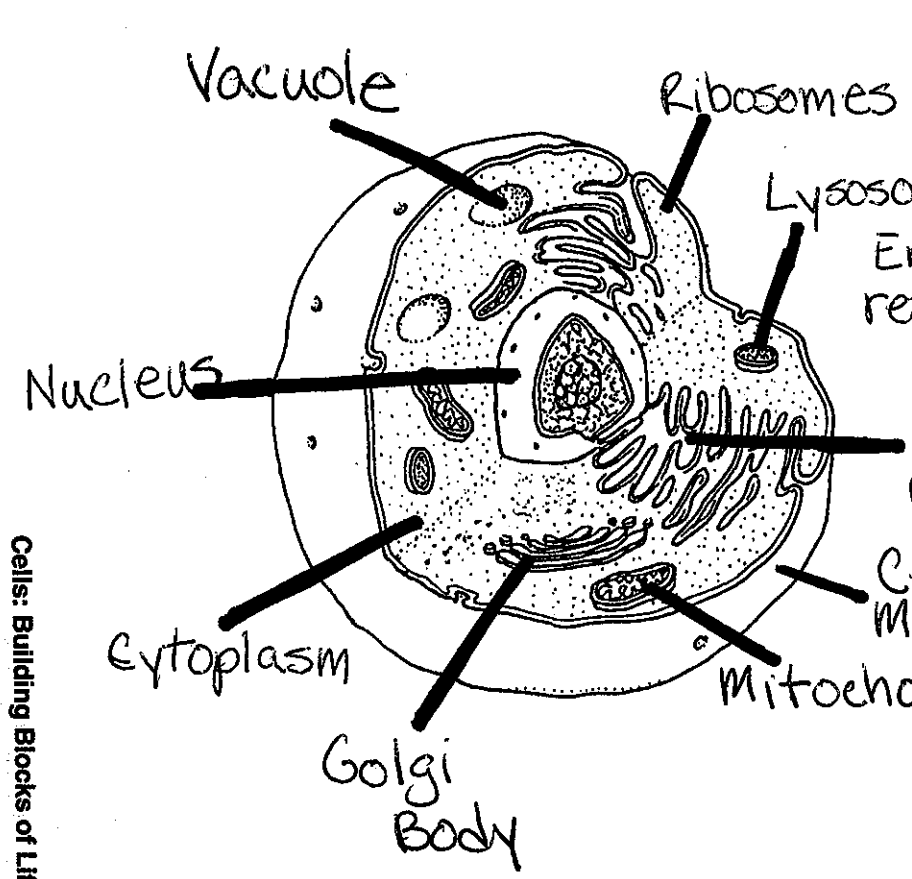
27. You are looking at the inside of a cell. Explain how you can tell whether the cell is animal, bacterial, or plant.

28. Describe the functions of the nuclear membrane, chromatin, and nucleolus.

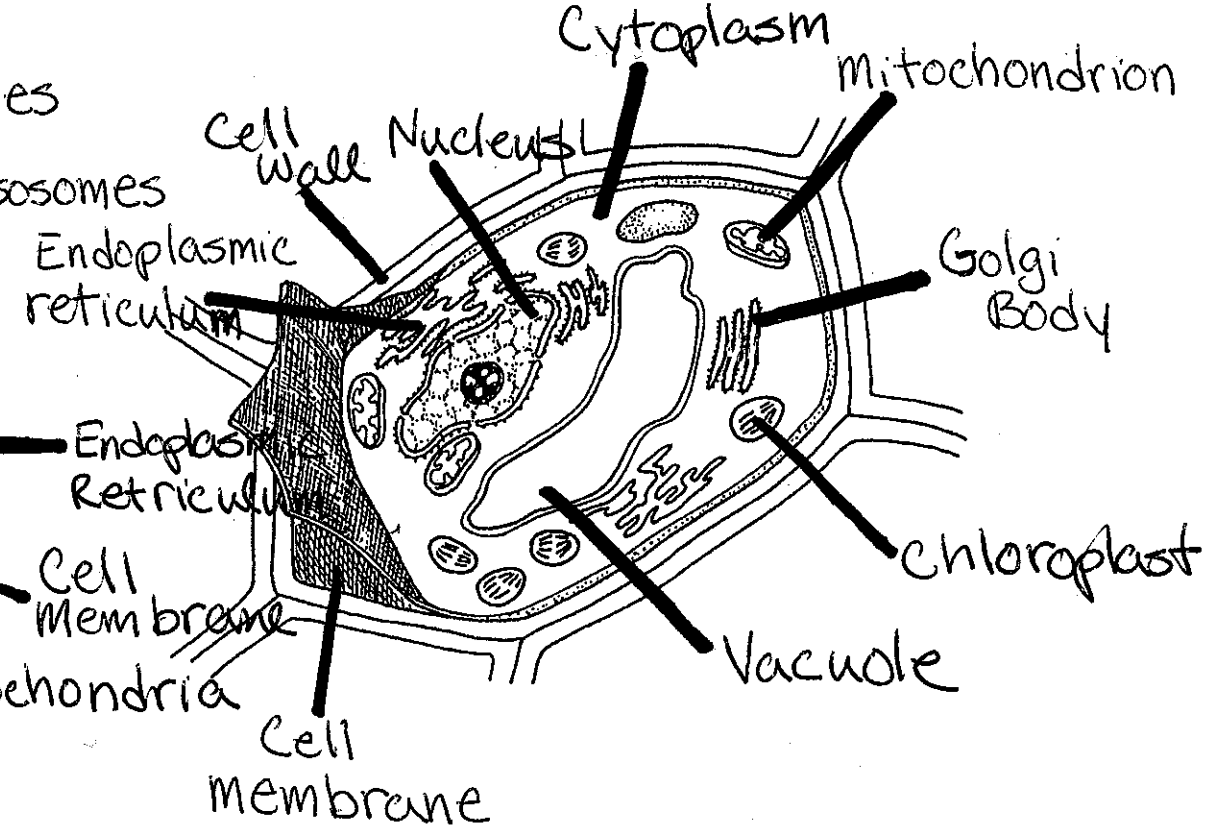
29. How do organisms differ in the ways they obtain their energy source, or food?

30. Airplanes respond to certain stimuli and use energy. Why, then, are airplanes not considered living things?

Animal Cell



Plant Cell



Plant Cell

Animal Cell