

Cell Structure and Function ▪ *Guided Reading and Study*

Looking Inside Cells

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

Use Target Reading Skills

Before you read, preview Figure 12. Then write two questions that you have about the illustrations in a graphic organizer like the one below. As you read, answer your questions.

Plant and Animal Cells

Q. How are animal cells different from plant cells?
A.
Q.
A.

Introduction

1. What are organelles?

Enter the Cell

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

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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.

4. What does the cell wall do?

5. Where is the cell membrane located in cells that have cell walls?

6. Where is the cell membrane located in cells that do NOT have cell walls?

7. 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.

Sail On to the Nucleus

8. Circle the letter of each sentence that is true about the nucleus.

- a. Materials pass in and out of the nucleus through pores in the nuclear envelope.
- b. Chromatin contains the instructions that direct the functions of a cell.
- c. The nucleolus is part of the nuclear envelope.
- d. Ribosomes are made in the nucleolus.

Organelles in the Cytoplasm

9. 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

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Looking Inside Cells *(continued)*

10. 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	

Specialized Cells

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

Bacterial Cells

12. 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.

Cell Structure and Function ▪ *Review and Reinforce*

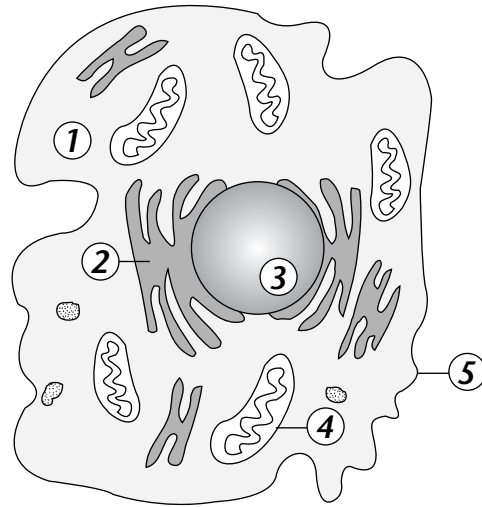
Looking Inside Cells

Understanding Main Ideas

Identify each of the cell structures in the figure.

1. _____
2. _____
3. _____
4. _____
5. _____

Simplified Animal Cell



Cell Structure and Function

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 the cells of plants and other organisms 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. The region between the cell membrane and the nucleus is called the _____.
11. _____ produce most of the energy the cell needs to carry out its functions.
12. A maze of passageways called the _____ carries proteins and other materials from one part of the cell to another.
13. _____ function as factories to produce proteins.
14. _____ receive proteins and other newly formed materials and distribute them to other parts of the cell.
15. Organelles called _____ capture energy from sunlight and use it to produce food for the cell.
16. The storage area of a cell is called a(n) _____.
17. _____ are small, round structures in cells that break down large food particles into smaller ones.

Cell Structure and Function ▪ *Guided Reading and Study*

Chemical Compounds in Cells

This section identifies the basic building blocks of cells. It also explains the importance of water to cells.

Use Target Reading Skills

As you read, compare and contrast carbohydrates, proteins, and lipids in the table below.

Type of Compound	Elements	Functions
Carbohydrate	Carbon, hydrogen, oxygen	
Protein		
Lipid		

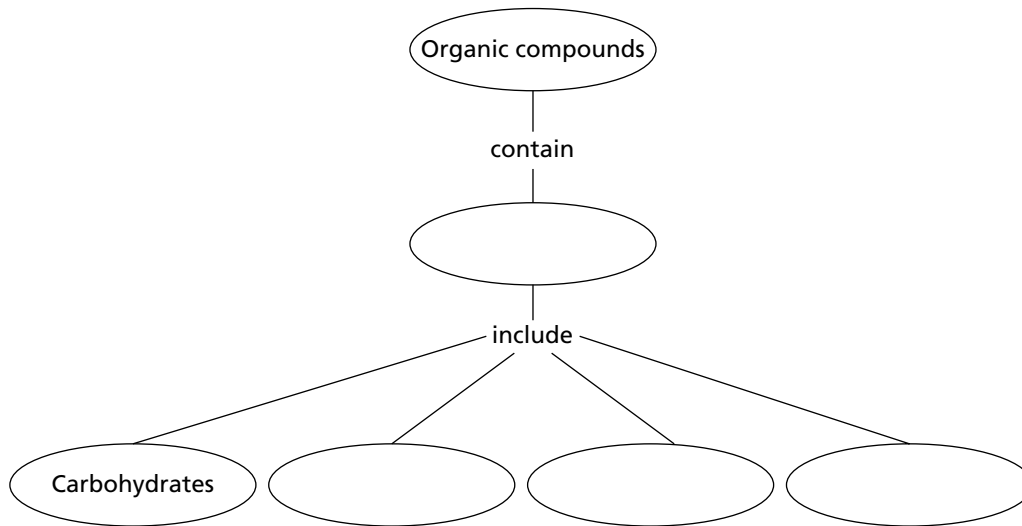
Elements and Compounds

1. A(n) _____ is any substance that cannot be broken down into simpler substances. Its smallest unit is the _____.
2. When two or more elements combine chemically, they form a(n) _____. Its smallest unit is usually called a(n) _____.

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Chemical Compounds in Cells *(continued)*

3. Complete this concept map on organic compounds.



4. Compounds that do not contain carbon are called _____.

Carbohydrates

5. A carbohydrate is made of carbon, hydrogen, and _____.

6. Starch is a kind of carbohydrate. What foods have starch?

7. How do cells use carbohydrates?

Lipids

8. What are three examples of lipids?

a. _____ b. _____

c. _____

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9. How are lipids like carbohydrates?

10. Cells store _____ in lipids to use later.

Proteins

11. _____ form parts of cell membranes and many of the cell's organelles.

12. What small molecules make up proteins? _____

13. What do enzymes do?

Nucleic Acids

14. Very long organic molecules that contain instructions that cells need to function are called _____.

15. Is the following sentence true or false? Cells use the instructions in nucleic acids to carry out all life functions. _____

16. List the two kinds of nucleic acids.

a. _____ b. _____

Water and Living Things

17. List four ways that cells use water.

a. _____

b. _____

c. _____

d. _____



Cell Structure and Function ▪ *Review and Reinforce*

Chemical Compounds in Cells

Understanding Main Ideas

Fill in the blanks in the table below.

Organic Compounds		
Type of Compound	Example	Major Roles in Living Things
Carbohydrates	1. _____	Help form cell walls and membranes; provide energy
2. _____	Fats	Help form cell membranes; 3. _____
4. _____	Enzymes	Help form cell membranes and organelles; speed up chemical reactions
5. _____	DNA	Direct all the cell's functions; 6. _____

Building Vocabulary

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

- | | |
|-----------------------|---|
| ___ 7. element | a. type of nucleic acid that plays an important role in the production of proteins |
| ___ 8. compound | b. type of nucleic acid that passes from parent to offspring and directs all the cell's functions |
| ___ 9. carbohydrate | c. very large organic molecules made of carbon, oxygen, hydrogen, nitrogen, and phosphorus |
| ___ 10. proteins | d. large organic molecules made of carbon, hydrogen, oxygen, nitrogen, and, in some cases, sulfur |
| ___ 11. amino acids | e. small molecules that make up proteins |
| ___ 12. enzyme | f. the chemical combination of two or more elements |
| ___ 13. lipid | g. type of protein that speeds up chemical reactions in living things |
| ___ 14. nucleic acids | h. any substance that cannot be broken down into simpler substances |
| ___ 15. DNA | i. an energy-rich organic compound such as sugar |
| ___ 16. RNA | j. an energy-rich organic compound such as fat |

Cell Structure and Function ▪ *Guided Reading and Study*

The Cell in Its Environment

This section tells how things move into and out of cells.

Use Target Reading Skills

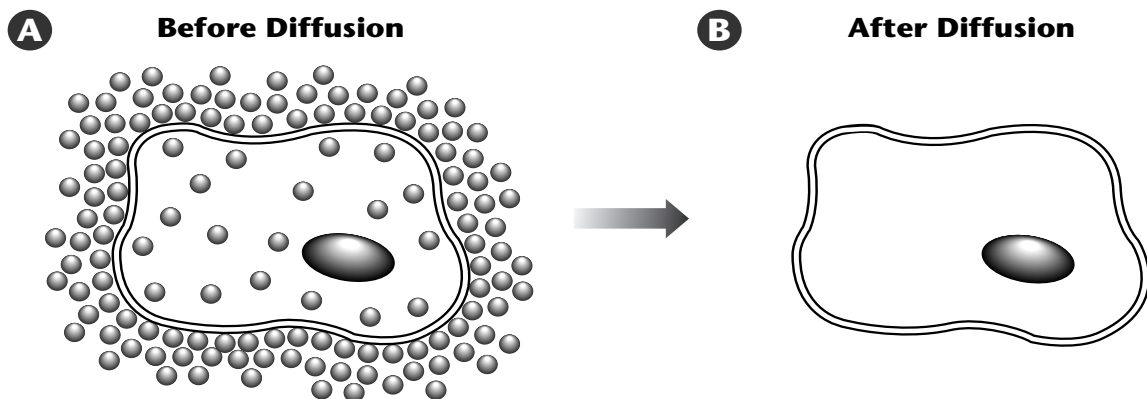
After you read the section, reread the paragraphs that contain definitions of Key Terms. Use all the information you have learned to write a definition of each Key Term in your own words.

Introduction

1. The cell membrane is _____, which means that some substances can pass through it while others cannot.

Diffusion

2. List three ways that substances can move into and out of a cell.
 - a. _____
 - b. _____
 - c. _____
3. In diffusion, molecules move from an area of _____ concentration to an area of _____ concentration.
4. Draw molecules on Part B of the diagram below to show how the molecules are distributed inside and outside the cell after diffusion has occurred.



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Osmosis

5. In _____, water molecules diffuse through a selectively permeable membrane.

Active Transport

6. Two ways of moving things into and out of cells that do NOT need energy are _____ and _____.
Moving materials through a cell membrane without using energy is called _____ transport.

7. How does active transport differ from passive transport?

8. List two ways that the cell moves things by active transport.

a. _____
b. _____

9. Is the following sentence true or false? As a cell gets larger, it takes longer for a molecule that has entered the cell to reach the middle of the cell.

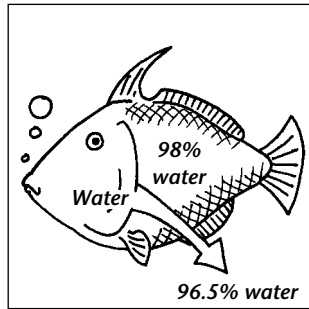


Cell Structure and Function ▪ *Review and Reinforce*

The Cell in Its Environment

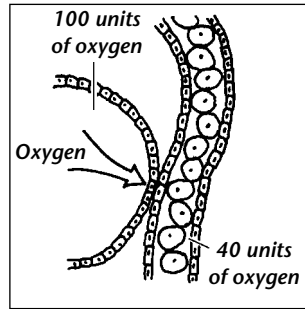
Understanding Main Ideas

Fill in the blank to identify the process illustrated in each of the following figures.



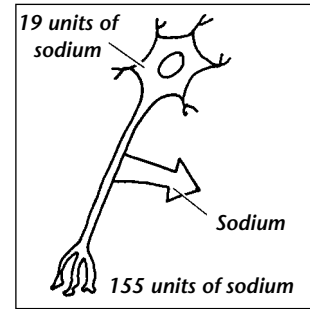
Water moves out of the cells of a saltwater fish and into the ocean.

1. _____



Oxygen moves from the lungs into the bloodstream.

2. _____



Sodium is pumped out of a nerve cell.

3. _____

Answer the following questions on a separate sheet of paper.

4. Explain how osmosis differs from diffusion.
5. Compare and contrast active and passive transport.
6. Identify two methods of active transport.
7. State one reason that cells are small.

Building Vocabulary

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

- _____ 8. Selectively permeable means letting some but not all substances pass through.
- _____ 9. Osmosis is the process by which molecules tend to move from an area of higher concentration to an area of lower concentration.
- _____ 10. The process by which water moves across a selectively permeable membrane is called diffusion.
- _____ 11. Diffusion and osmosis are types of active transport.
- _____ 12. Passive transport requires the cell's own energy.