

## Chapter 2 Cell Processes and Energy

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**SECTION 2-1 REVIEW AND REINFORCE**

# Chemical Compounds in Cells

## ◆ Understanding Main Ideas

Fill in the blanks to complete 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. most compounds that contain carbon   |
| _____ 8. atom                 | b. type of nucleic acid that plays an important role in the production of proteins                |
| _____ 9. compound             | c. compounds that do not contain the element carbon   |
| _____ 10. molecule            | d. type of nucleic acid that passes from parent to offspring and directs all the cell's functions |
| _____ 11. organic compounds   | e. very large organic molecules made of carbon, oxygen, hydrogen, nitrogen, and phosphorus        |
| _____ 12. inorganic compounds | f. large organic molecules made of carbon, hydrogen, oxygen, nitrogen, and, in some cases, sulfur |
| _____ 13. proteins            | g. the smallest unit of most compounds  |
| _____ 14. amino acids         | h. small molecules that make up proteins  |
| _____ 15. enzyme              | i. the chemical combination of two or more elements   |
| _____ 16. nucleic acids       | j. type of protein that speeds up chemical reactions in living things                             |
| _____ 17. DNA                 | k. the smallest unit of an element  |
| _____ 18. RNA                 | l. any substance that cannot be broken down into simpler substances                               |

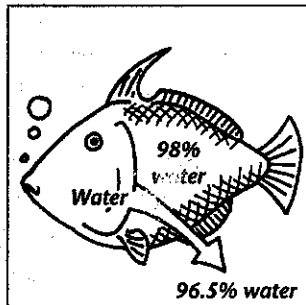
**SECTION 2-2**

**REVIEW AND REINFORCE**

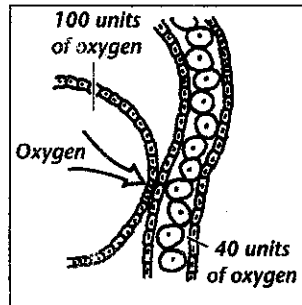
**The Cell in Its Environment**

**◆ Understanding Main Ideas**

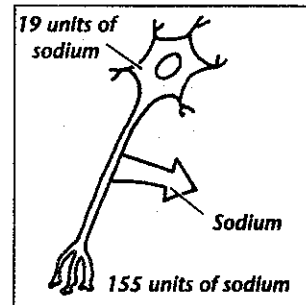
Fill in the blank to identify the process illustrated in each of the following figures.



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



Oxygen moves from the lungs into the bloodstream.



Sodium is pumped out of a nerve cell.

1. \_\_\_\_\_ 2. \_\_\_\_\_ 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. If a membrane is selectively permeable, it lets 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 energy.

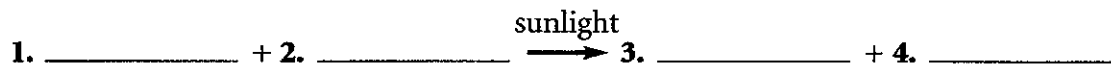
**SECTION 2-3**

**REVIEW AND REINFORCE**

# Photosynthesis

## ◆ Understanding Main Ideas

Fill in the blanks in the photosynthesis equation below with the names of the missing compounds. Then answer the questions that follow in the spaces provided.



5. What are the raw materials of photosynthesis?

\_\_\_\_\_

6. What are the products of photosynthesis?

\_\_\_\_\_

7. Why is *sunlight* written above the arrow in the equation, rather than on either side of it?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

8. Where does photosynthesis occur?

\_\_\_\_\_

\_\_\_\_\_

## ◆ Building Vocabulary

Fill in the blank to complete each statement.

9. The process by which a cell captures the energy in sunlight and uses it to make food is called \_\_\_\_\_.

10. \_\_\_\_\_ are colored chemical compounds that absorb light.

11. The main pigment found in the chloroplasts of plants is \_\_\_\_\_.

12. \_\_\_\_\_ are small openings on the undersides of leaves through which carbon dioxide enters a plant.

**SECTION 2 - 4**

**REVIEW AND REINFORCE**

# Respiration

## ◆ Understanding Main Ideas

Fill in the blanks in the table below. Then answer the questions that follow in the spaces provided.

**Respiration**

Raw Materials	Products
1.	3.
2.	4.
	5.

6. Where in the cell does the first stage of respiration take place?

\_\_\_\_\_

7. Where in the cell does the second stage of respiration take place?

\_\_\_\_\_

8. How does fermentation differ from respiration?

\_\_\_\_\_

\_\_\_\_\_

9. Which type of fermentation occurs in yeast?

\_\_\_\_\_

10. Which type of fermentation sometimes occurs in the human body?

\_\_\_\_\_

## ◆ Building Vocabulary

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

\_\_\_\_\_ 11. The process by which cells “withdraw” energy from glucose is called photosynthesis.

\_\_\_\_\_ 12. Respiration is an energy-releasing process that does not require oxygen.

**SECTION 2-5**

**REVIEW AND REINFORCE**

**Cell Division**

**◆ Understanding Main Ideas**

Fill in the blanks in the table below. Then answer the questions that follow in the spaces provided.

**Phases of Mitosis**

Phase	Event
Prophase	1.
2.	Chromosomes attach to spindle fibers
Anaphase	3.
4.	New nuclear membranes form

5. Which stage of the cell cycle usually lasts longest?

\_\_\_\_\_

6. During which stage of the cell cycle does DNA replication occur?

\_\_\_\_\_

7. During which stage of the cell cycle does the cell membrane pinch the cell in two?

\_\_\_\_\_

**◆ Building Vocabulary**

Match each term with its definition by writing the letter of the correct term on the line beside the definition.

\_\_\_\_\_ 8. Regular sequence of growth and division that cells undergo

\_\_\_\_\_ 9. First stage of the cell cycle

\_\_\_\_\_ 10. Process in which DNA is copied

\_\_\_\_\_ 11. Stage of the cell cycle during which the cell's nucleus divides

\_\_\_\_\_ 12. Doubled rod of condensed chromatin

\_\_\_\_\_ 13. Each identical rod of a chromosome

\_\_\_\_\_ 14. Final stage of the cell cycle

a. interphase

b. mitosis

c. cell cycle

d. chromatid

e. cytokinesis

f. replication

g. chromosome

Name: \_\_\_\_\_

Class: Life Science  
Ch. 2 Review

Choose the letter of the correct answer.

1. Why is water important for a cell?  
[A] Most chemical reactions in cells require water.  
[B] Water is the main ingredient in DNA.  
[C] Water is an essential organic compound for the body.  
[D] All proteins require water to function.
  
2. What product of photosynthesis do most living things need to survive?  
[A] water                      [B] chlorophyll                      [C] carbon dioxide                      [D] oxygen
  
3. Which of these choices causes a form of alcoholic fermentation?  
[A] lactic acid                      [B] carbon dioxide                      [C] bread                      [D] yeast
  
4. The water in a cell  
[A] keeps substances from moving in and out of cells.  
[B] prevents chemical reactions from taking place.  
[C] allows the temperature of the cell to change rapidly.  
[D] helps the cell keep its size and shape.
  
5. Respiration and photosynthesis keep the levels of carbon dioxide and oxygen in the atmosphere  
[A] constantly increasing.                      [B] constantly decreasing.  
[C] fairly constant.                      [D] constantly changing.
  
6. What happens during respiration?  
[A] Oxygen is released into the air.  
[B] Glucose is broken down, releasing energy.  
[C] Water and carbon dioxide are converted into energy.  
[D] Carbohydrates are released into the bloodstream.
  
7. Which term refers to the production of energy by a cell without using oxygen?  
[A] fermentation                      [B] respiration                      [C] fertilization                      [D] photosynthesis



Choose the letter of the correct answer.

8. What causes lactic-acid fermentation?

- [A] too little sugar in muscle cells                      [B] too much sugar in muscle cells  
[C] too little oxygen in muscle cells                      [D] too much oxygen in muscle cells

9. One reason that cells are small is because they

- [A] use energy.      [B] must remove wastes.      [C] lack food.      [D] contain water.

10. DNA and RNA are      [A] lipids.      [B] enzymes.      [C] nucleic acids.      [D] amino acids.

11. What are the products of photosynthesis?

- [A] carbon dioxide and water                      [B] oxygen and water  
[C] carbon dioxide and sugars                      [D] oxygen and sugars

12. Which term refers to proteins that speed up chemical reactions in living things?

- [A] carbohydrate      [B] nucleic acid      [C] amino acid      [D] enzyme

13. What happens during photosynthesis?

- [A] The cell uses the energy in sunlight to make carbon dioxide.  
[B] The cell uses oxygen to make food.  
[C] The cell uses the energy in sunlight to make food.  
[D] The cell uses glucose to make oxygen.

14. Which term refers to the movement of molecules from an area of higher concentration to an area of lower concentration?

- [A] active transport      [B] collision                      [C] diffusion                      [D] concentration

15. Which term refers to the movement of materials through a cell membrane without using energy?

- [A] concentration      [B] passive transport      [C] active transport      [D] collision

16. What happens during cytokinesis in animal cells?

- [A] Two new daughter cells are formed.  
[B] Each organelle divides into two parts.  
[C] A new round of mitosis begins.  
[D] A cell plate forms in the middle of the cell.

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

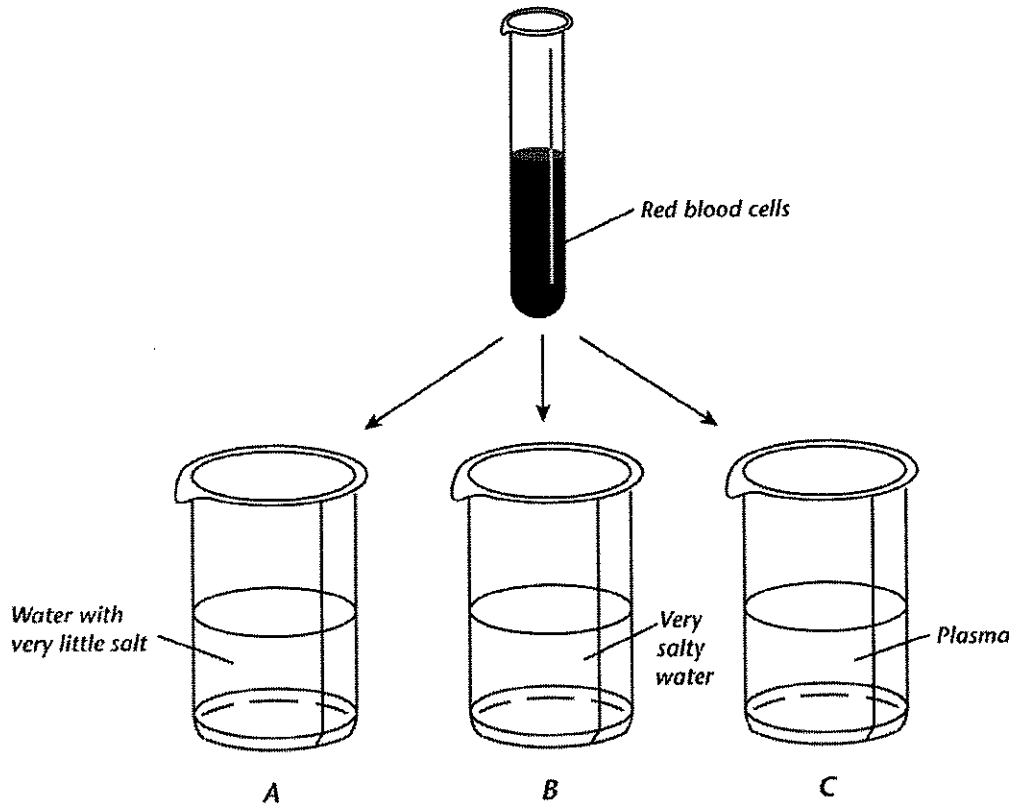
17. A heterotroph is an organism that cannot make its own food.
18. When muscle cells run low on oxygen, lactic-acid fermentation takes place.
19. An organic compound always contains carbon.

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

20. A DNA molecule is often called a \_\_\_\_\_ because it twists like the threads of a screw.
21. The final stage of the cell cycle, during which the cytoplasm divides, is called \_\_\_\_\_.
22. During respiration, glucose is combined with \_\_\_\_\_, releasing energy.
23. Plants make their own food using energy that comes from the \_\_\_\_\_.
24. The diffusion of \_\_\_\_\_ molecules is called osmosis.
25. The energy from glucose is released in the process of \_\_\_\_\_.

Use the diagram to answer the question(s).

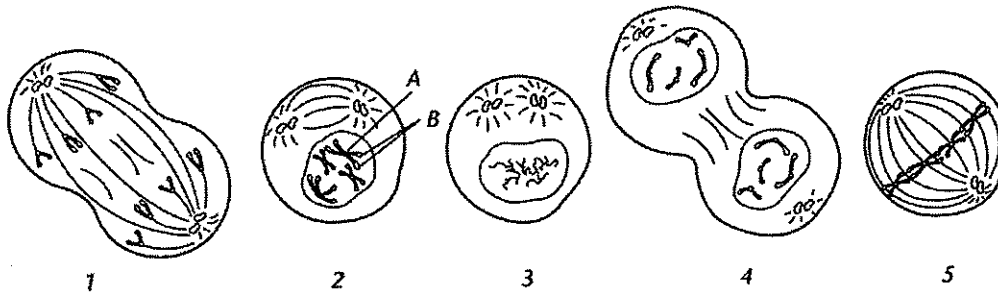
### **Passive Transport in Red Blood Cells**



26. Suppose the test tube contained plant cells instead of red blood cells. What would happen to the cells if they were placed in beaker A?
27. Many single-celled organisms that live in fresh water have contractile vacuoles, which remove excess water from their cytoplasm. Why does the environment in which these organisms live make contractile vacuoles important?

Use the diagram to answer the question(s).

**The Cell Cycle**



28. Identify structure A and describe its function.

29. Which drawings represent parts of mitosis?

Write an answer to the following question(s).

30. Animals do not make their own food from energy in sunlight. Explain why they still depend on the sun for energy.