

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

### Section 7-3 Cell Boundaries (pages 182-189)

#### Key Concepts

- What are the main functions of the cell membrane and the cell wall?
- What happens during diffusion?
- What is osmosis?

#### Cell Membrane (page 182)

1. What are the functions of the cell membrane? It regulates what enters and leaves the cell and also provides protection and support.
2. The core of nearly all cell membranes is a double-layered sheet called a(an) lipid bilayer.
3. What is the difference in the function of the proteins and the carbohydrates attached to a cell membrane? Some of the proteins form channels and pumps that help move materials across the membrane. Many of the carbohydrates act like chemical identification cards.

#### Cell Walls (page 183)

4. In what organisms are cell walls found? They are found in plants, algae, fungi, and many prokaryotes.
5. Is the following sentence true or false? The cell wall lies inside the cell membrane. false
6. What is the main function of the cell wall? It provides support and protection for the cell.
7. What are plant cell walls mostly made of? They are made mostly of cellulose.

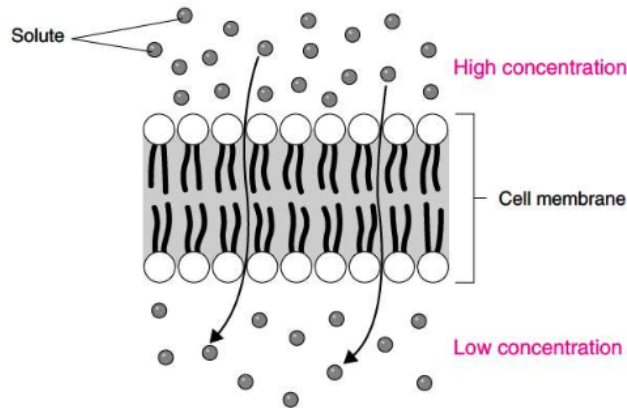
#### Diffusion Through Cell Boundaries (pages 183-184)

8. What is the concentration of a solution? It is the mass of the solute in a given volume of solution, or mass/volume.
9. What is diffusion? It is the process by which molecules tend to move from an area where they are more concentrated to an area where they are less concentrated.
10. What is meant when a system has reached equilibrium? It means that the concentration of the solute is the same throughout the system.

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Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

11. The molecules of solute in the illustration are moving through the cell membrane from top to bottom. Indicate with labels which side of the membrane has a high concentration of solute and which has a low concentration.



**Osmosis (pages 185–186)**

12. What does it mean that biological membranes are selectively permeable?  
Some substances can pass across them and others cannot.
13. What is osmosis? It is the diffusion of water through a selectively permeable membrane.
14. Is the following sentence true or false? Water tends to diffuse from a region where it is less concentrated to a region where it is highly concentrated. false
15. When will water stop moving across a membrane? It will move across the membrane until equilibrium is reached.

Match the situation to the description.

Situation	Description
<u>b</u> 16. Two solutions are isotonic.	a. The solution is above strength in solute.
<u>a</u> 17. A solution is hypertonic.	b. The solutions are the same strength.
<u>c</u> 18. A solution is hypotonic.	c. The solution is below strength in solute.

19. On which side of a selectively permeable membrane does osmosis exert a pressure?  
It exerts a pressure on the hypertonic side.

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Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**Facilitated Diffusion (page 187)**

20. What happens during the process of facilitated diffusion? Molecules such as glucose that cannot cross the cell membrane's lipid bilayer directly move through protein channels instead.
21. What is the role of protein channels in the cell membrane? Protein channels allow molecules (that are too large) to cross the membrane.
22. Is the following sentence true or false? Facilitated diffusion does not require the cell to use energy. true

**Active Transport (pages 188–189)**

23. The energy-requiring process that moves material across a cell membrane against a concentration difference is called active transport.
24. Is the following sentence true or false? Active transport always requires transport proteins during the process. false
25. Complete the table about types of active transport.

**TYPES OF ACTIVE TRANSPORT**

Type	Description
Endocytosis	Process of taking materials into the cell by means of infoldings of the cell membrane
Phagocytosis	Process of taking large particles into the cell
Exocytosis	The release of large amounts of material from the cell

26. During endocytosis, what happens to the pocket in the cell membrane when it breaks loose from the membrane? It forms a vacuole within the cytoplasm.