



7.3 Cell Transport

Lesson Objectives

-  Describe passive transport.
-  Describe active transport.

Lesson Summary

Passive Transport The movement of materials across the cell membrane without using cellular energy is called passive transport.

- ▶ Diffusion is the process by which particles move from an area of high concentration to an area of lower concentration.
- ▶ Facilitated diffusion is the process by which molecules that cannot directly diffuse across the membrane pass through special protein channels.
- ▶ Osmosis is the facilitated diffusion of water through a selectively permeable membrane. There are three ways to describe the relative concentrations of solute and solvent in solutions on opposite sides of a membrane: two adjacent solutions are isotonic if they have the same concentrations of solute; a hypertonic solution has a higher concentration of solute compared to the other solution; and a hypotonic solution has a lower concentration of solute compared to the other solution.
- ▶ Osmotic pressure is the force caused by the net movement of water by osmosis.

Active Transport The movement of materials against a concentration difference is called active transport. Active transport requires energy.

- ▶ Transport proteins that act like pumps use energy to move small molecules and ions across cell membranes.
- ▶ The bulk transport of large molecules and clumps of materials into and out of cells occurs by movements of the cell membrane, which require energy.

Passive Transport

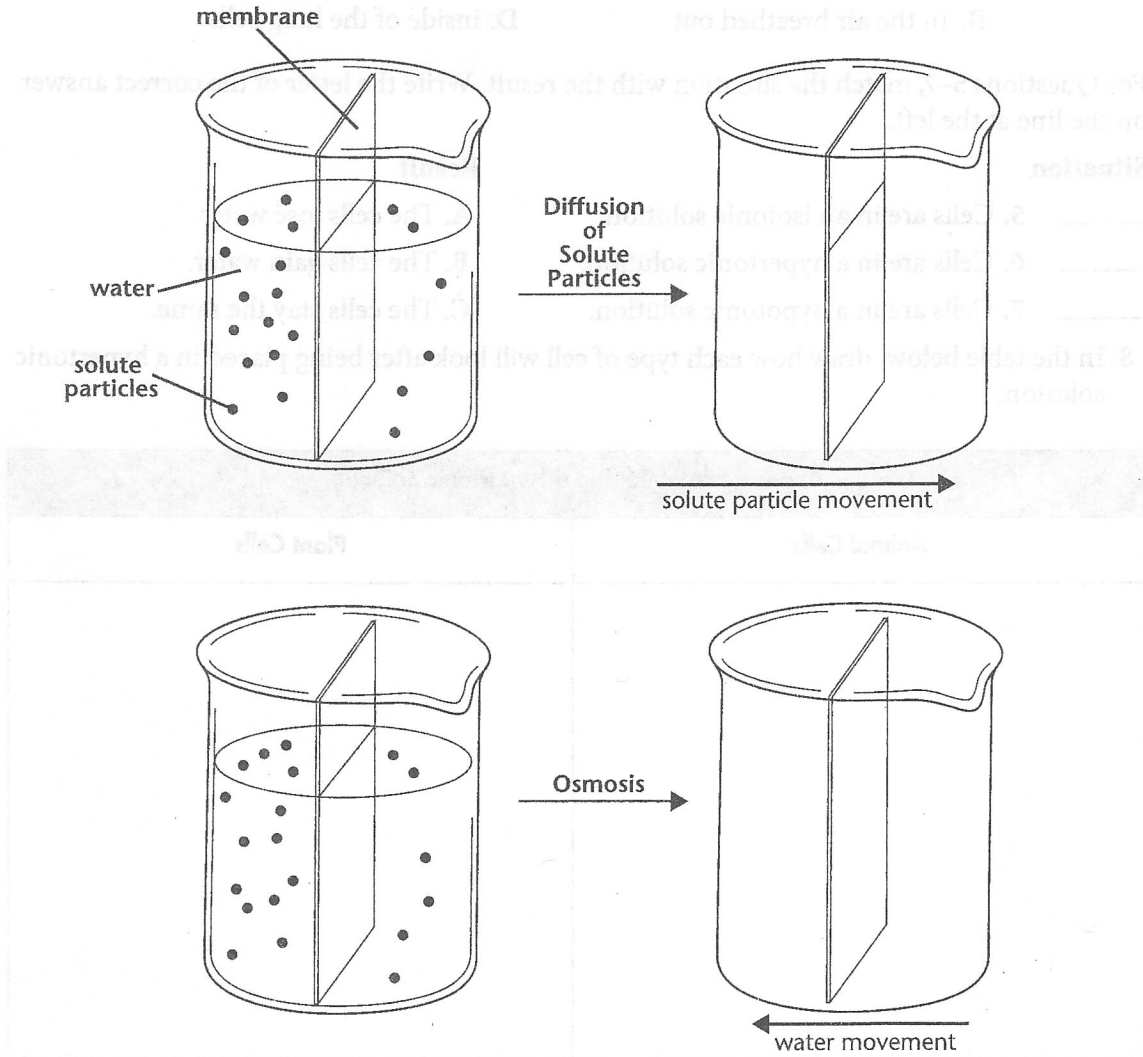
For Questions 1–2, write the letter of the correct answer on the line at the left.

- _____ 1. Which of the following must be true for diffusion to occur?
- A. Molecules or particles must have different sizes.
 - B. Special protein channels must always be available.
 - C. There must be areas of different concentrations.
 - D. Energy must be available.
- _____ 2. Which of the following statements tells how facilitated diffusion differs from simple diffusion?
- A. Particles move through cell membranes without the use of energy by cells.
 - B. Particles tend to move from high concentration to lower concentration.
 - C. Particles move within protein channels that pass through cell membranes.
 - D. Particles tend to move more slowly than they would be expected to move.

Diffusion and Osmosis

Diffusion is the movement of particles from an area of high concentration to an area of low concentration. Osmosis is the diffusion of water through a selectively permeable membrane.

Look at the beakers on the left. In the beakers on the right, draw in any changes in water level or number of solute particles on each side of the membrane that occur as a result of the described process.



Use the diagrams to answer the question.

9. Look at the top left beaker. What would happen if the membrane did not allow water or solute particles to pass through it?

- _____ 3. Which term refers to the condition that exists when *no* net change in concentration results from diffusion?
 A. concentration C. osmosis
 B. equilibrium D. randomness
- _____ 4. Air has a higher concentration of oxygen molecules than does the cytoplasm of your lung cells. Where in your lungs will there be a net increase of oxygen?
 A. in the air breathed in C. outside of the lung cells
 B. in the air breathed out D. inside of the lung cells

For Questions 5–7, match the situation with the result. Write the letter of the correct answer on the line at the left.

Situation

- _____ 5. Cells are in an isotonic solution.
 _____ 6. Cells are in a hypertonic solution.
 _____ 7. Cells are in a hypotonic solution.

Result

- A. The cells lose water.
 B. The cells gain water.
 C. The cells stay the same.

8. In the table below, draw how each type of cell will look after being placed in a hypertonic solution.

Appearance of Cells in a Hypertonic Solution	
Animal Cells	Plant Cells
