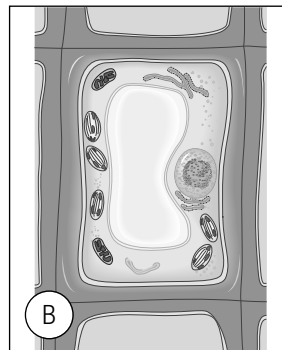
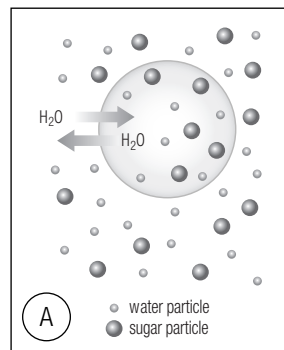


## How does osmosis move substances through the cell membrane?

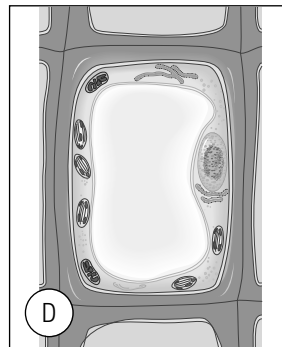
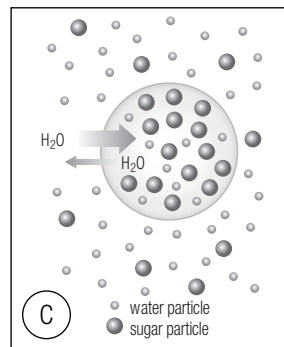
Osmosis is a special kind of diffusion that involves water. **Osmosis** is the diffusion of water through a selectively permeable membrane. Osmosis happens when water particles move from a place where their concentration is higher to a place where their concentration is lower.

Osmosis is important to cells. Cells contain water and need it to survive. Cells also live in water or in watery surroundings. What will happen if the concentration of water inside a cell is higher than outside a cell? Water will move out of the cell by osmosis. What will happen if the concentration of water inside a cell is lower than outside a cell? Water will move into the cell by osmosis. ✓

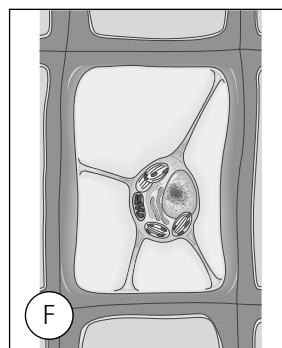
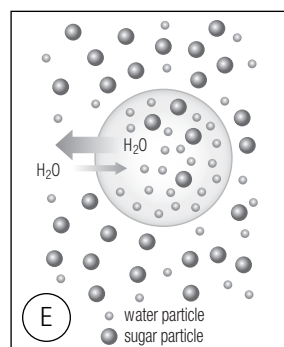
In A, the rate at which water particles move into the cell is the same as the rate at which they move out of the cell. A plant cell, shown in B, is normal and healthy.



In C, the concentration of water particles outside of the cell is higher than inside the cell. Water particles move into the cell by osmosis. A plant cell, shown in D, is swollen with extra water.



In E, the concentration of water particles outside of the cell is lower than inside the cell. Water particles move out of the cell by osmosis. A plant cell, shown in F, loses water. If you could see the whole plant, it would be wilted.



### ✓ Reading Check

2. If the concentration of water outside a cell is higher than it is inside a cell, in which direction will water move?

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Use with textbook pages 40–45.

## Crossing the cell membrane

### Vocabulary

diffusion  
concentration  
osmosis  
a selectively permeable membrane

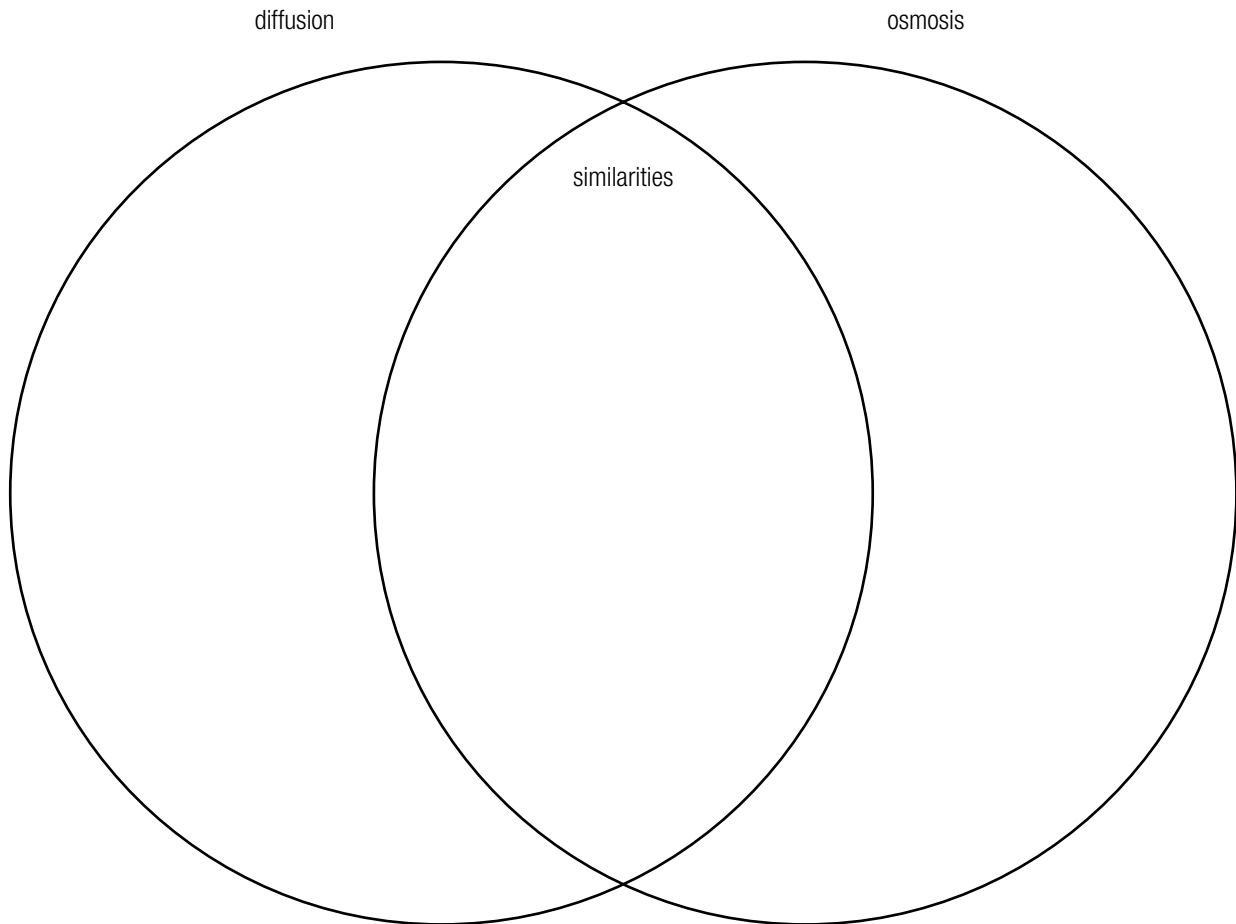
Use the terms in the vocabulary box to fill in the blanks. Each term may be used as often as necessary.

1. \_\_\_\_\_ refers to the amount of a substance in a given space.
2. \_\_\_\_\_ is the movement of particles from an area of higher concentration to an area of lower concentration.
3. \_\_\_\_\_ allows some materials to pass through it but keeps other materials out.
4. \_\_\_\_\_ is the diffusion of water molecules through a selectively permeable membrane.
5. \_\_\_\_\_ moves wastes from inside a cell to outside a cell.
6. \_\_\_\_\_ can be compared to a window screen.
7. \_\_\_\_\_ happens when water particles move from a place where their concentration is higher to a place where their concentration is lower.
8. \_\_\_\_\_ is the process by which oxygen is moved into a cell.
9. \_\_\_\_\_ is the process by which carbon dioxide is moved out of a cell.

Use with textbook pages 40–44.

## Osmosis and diffusion

Compare and contrast diffusion and osmosis using this Venn diagram. On the left side list how diffusion is different from osmosis. On the right side list how osmosis is different from diffusion. In the middle section list how they are similar to each other.




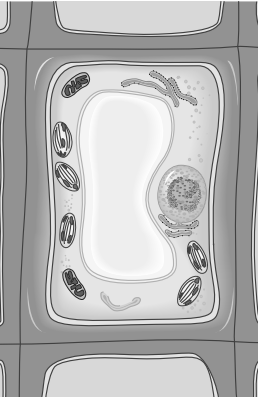
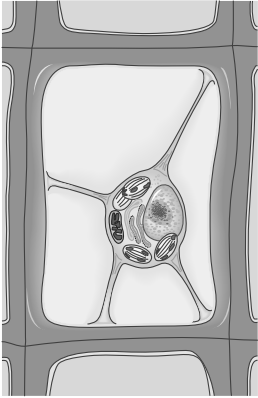
Name \_\_\_\_\_

Date \_\_\_\_\_

Use textbook pages 43–45.

## Examples of osmosis

To predict the direction of water flow through a cell membrane, you have to compare the concentration of particles on both sides of the membrane. Examine the diagrams below. Explain why the plant cell looks different in each illustration.

Diagram	Explanation
<p>A.</p> 	
<p>B.</p> 	
<p>C.</p> 	

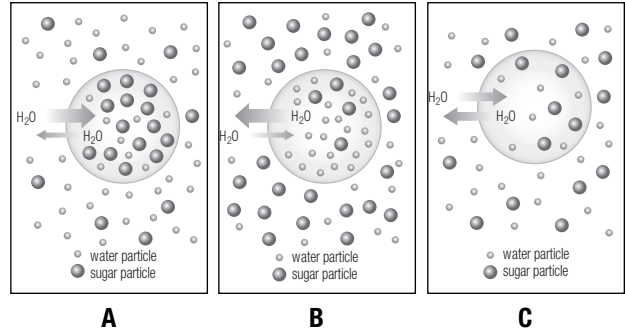
Use with textbook pages 40–45.

# Diffusion, osmosis, and the cell membrane

Circle the letter of the best answer.

- Diffusion is
  - the movement of particles from an area of low concentration to an area of high concentration
  - the movement of particles to the inside of a cell only
  - the movement of particles from an area of high concentration to an area of low concentration
  - when the particles do not move through the cell membrane at all
- Osmosis is
  - the movement of water from an area of low concentration to an area of high concentration
  - the movement of water to the inside of a cell only
  - the movement of water from an area of high concentration to an area of low concentration
  - when the water does not move through the cell membrane at all
- A selectively permeable membrane
  - keeps substances out of the cell
  - keeps substances in the cell
  - has many small openings
  - allows only water to pass through it

Use the following diagram to answer questions 4 and 5.



- In which diagram(s) does water move into and out of the cell at the same rate?
  - A
  - B
  - C
  - both A and B
- In which diagram(s) will the cell begin to swell?
  - A
  - B
  - C
  - both A and C

**Match each Term on the left with the best Descriptor on the right. Each Descriptor may be used only once.**

Term	Descriptor
6. _____ concentration	<b>A.</b> moves oxygen into cells
7. _____ diffusion	<b>B.</b> moves water into and out of cells
8. _____ osmosis	<b>C.</b> allows some substances through
9. _____ selectively permeable membrane	<b>D.</b> surrounds the cell with water
	<b>E.</b> amount of a substance in a certain place