

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.

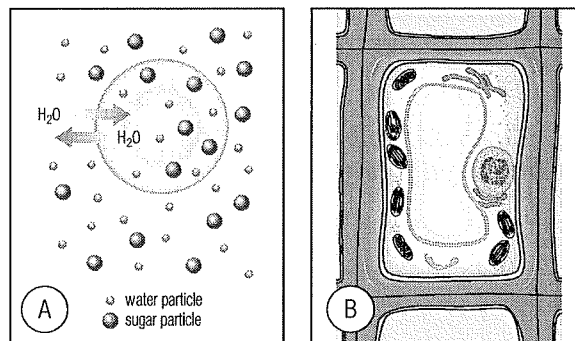
1. Concentration refers to the amount of a substance in a given space.
2. Diffusion is the movement of particles from an area of higher concentration to an area of lower concentration.
3. A selectively permeable membrane allows some materials to pass through it but keeps other materials out.
4. Osmosis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

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

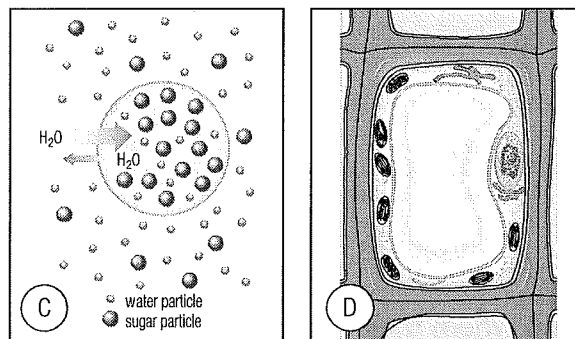
Osmosis is a special kind of diffusion that involves water. **Osmosis** is the diffusion of water through a selectively permeable membrane. Osmosis happens when water particles move from a place where their concentration is higher to a place where their concentration is lower.

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. ✓

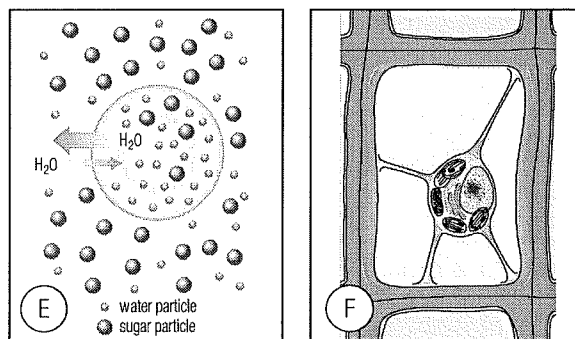
In A, the rate at which water particles move into the cell is the same as the rate at which they move out of the cell. A plant cell, shown in B, is normal and healthy.



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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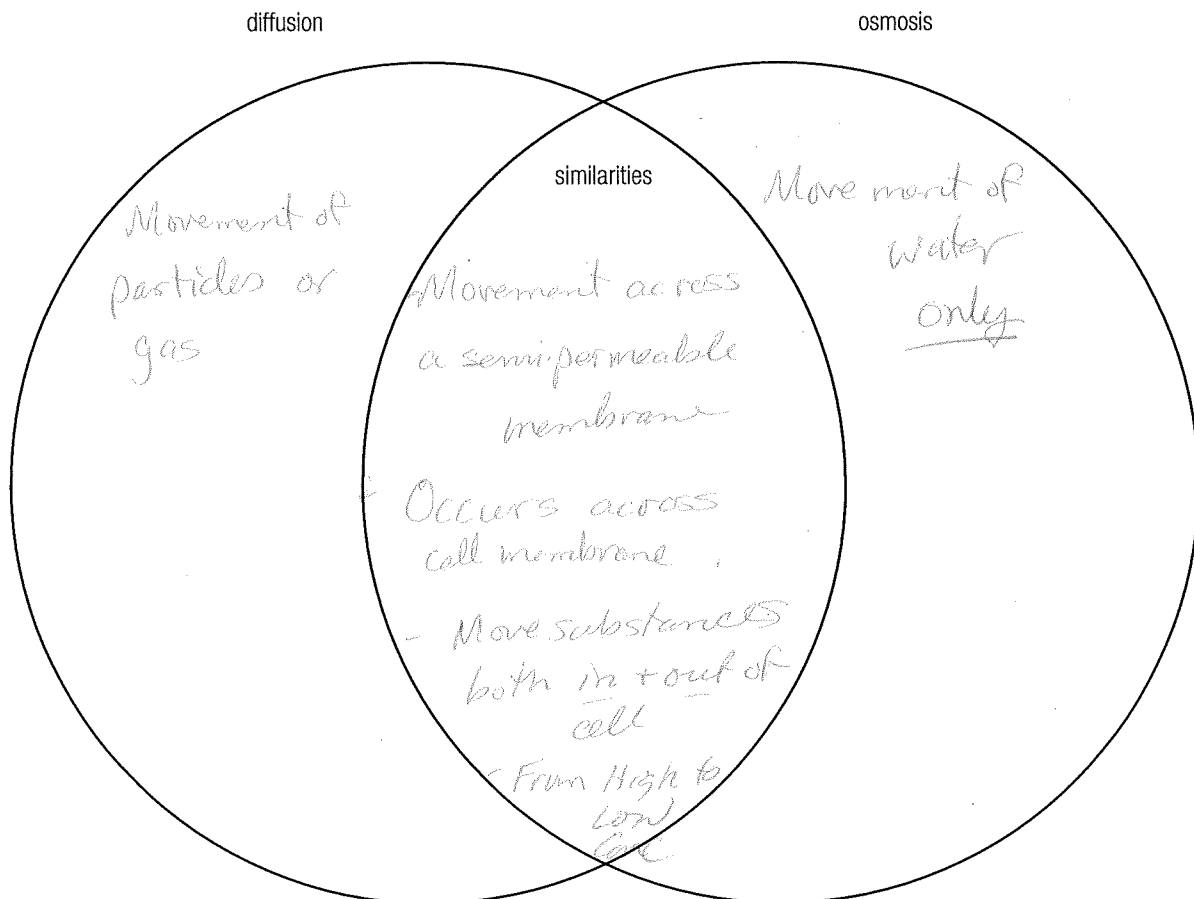


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Use with textbook pages 40-44.

## Osmosis and diffusion

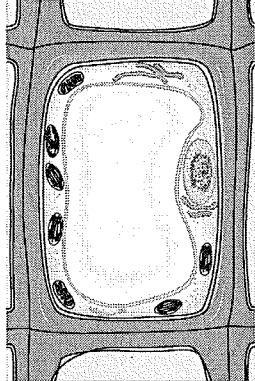
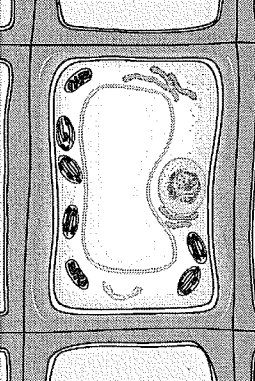
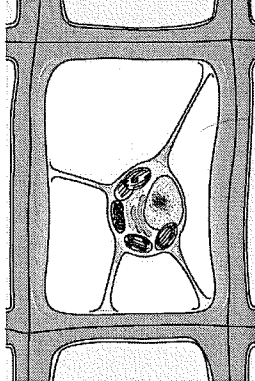
Compare and contrast diffusion and osmosis using this Venn diagram. On the left side list how diffusion is different from osmosis. On the right side list how osmosis is different from diffusion. In the middle section list how they are similar to each other.



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>Water particles move in, causing cell to swell.</p>
<p>B.</p> 	<p>Plant is in normal state as water particles move in and out at equal rate.</p>
<p>C.</p> 	<p>Water particles leave the cell by osmosis, causing cell to shrink. Plant cell membrane shrinks away from cell wall.</p>