

CHAPTER 7

Analyze a Problem: Practical Applications of Osmosis

Enrichment

Osmosis is a process that occurs naturally any time two solutions of different concentrations are separated from each other by a semipermeable membrane. For example, the watery solution inside the root cells of a growing plant normally has a higher concentration than the groundwater that surrounds the roots. The solution inside the cell is hypertonic in comparison to the groundwater. Water passes more rapidly across the cell membrane into the cell than it does out of the cell. This process makes possible the movement of water from the base of a plant upward through its trunk and branches into upper parts of the plant.

Differentiate Humans use the principle of osmosis in a number of practical applications. The table below lists some of those applications. In each case, tell how osmosis explains the process that takes place. If needed, use text resources to research explanations.

Then tell whether the solution in **bold** is isotonic, hypotonic, or hypertonic. Use the abbreviations *iso* for an isotonic solution, *hypo* for a hypotonic solution, and *hyper* for a hypertonic solution.

Application	Explanation	Solution
Pickles are made by immersing cucumbers in a concentrated saltwater solution .		
Spraying plants with a solution that contains too high a concentration of fertilizer might cause them to dry out and die.		
Patients undergoing surgery are given a 0.9% saline (saltwater) solution .		
One of the oldest methods of preserving foods is to pack them in saline solutions , which kill the bacteria that cause foods to spoil.		
Organisms that live in seawater have specialized mechanisms that prevent them from becoming dehydrated.		
Florists store fresh flowers in cold water to help the flowers keep their original appearance.		

Copyright © Glencoe/McGraw-Hill, a division of The McGraw-Hill Companies, Inc.