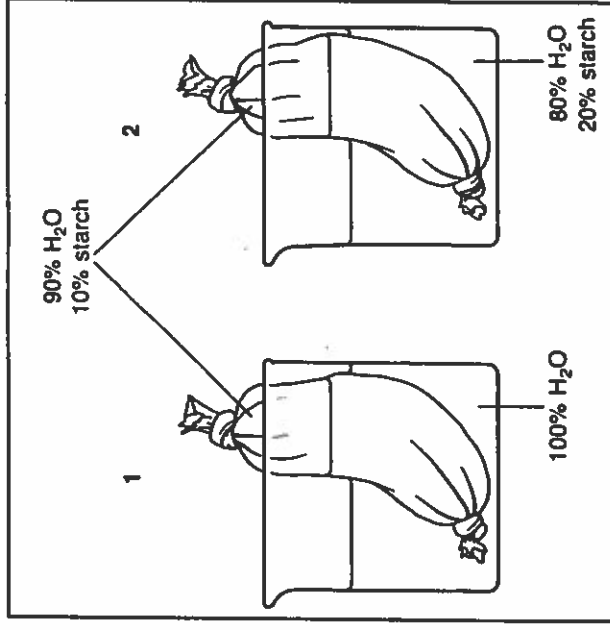


## D. PASSIVE TRANSPORT

Textbook reference: Sections 5-9, 5-12

Cells maintain homeostasis by passive and active transport across their membranes. Study the diagrams of the beakers right, noting the concentrations of various substances in the beakers and in the cellulose bags. Water molecules can pass through the cellulose, but starch cannot. Draw arrows in the diagrams to show the direction in which water will move. Then answer the questions that follow.



1. Which of the beakers contains a solution that is hypertonic relative to the bag's contents?

2. What will eventually happen to the concentrations beaker 2?

3. Will the same thing happen in beaker 1? Why or why not?

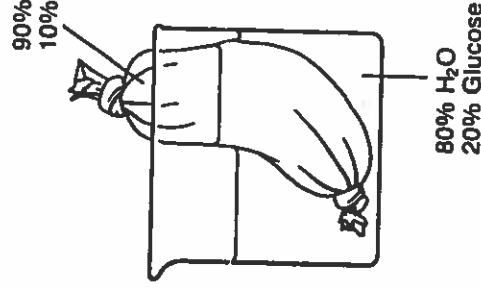
4. In which beaker will the bag experience a rise in osmotic pressure?

What will eventually happen as the pressure rises?

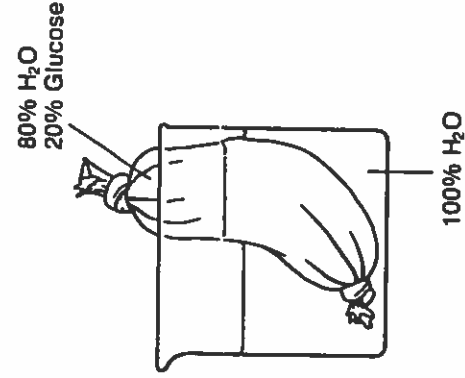
## E. CRITICAL THINKING: ANOTHER LOOK AT OSMOSIS

Textbook reference: Sections 5-9, 5-10

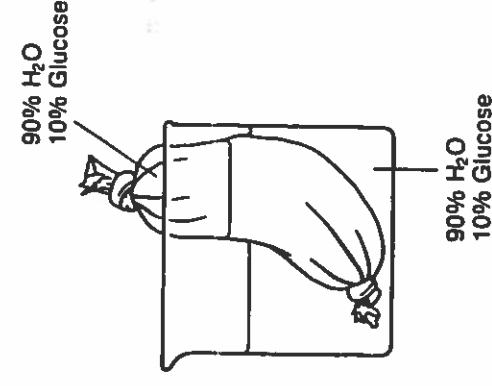
The direction in which water molecules move during osmosis depends on where the water molecules are more highly concentrated. Study the diagrams below. Decide whether the solution in each beaker is hypotonic, isotonic, or hypertonic in relation to the solution inside the cellulose bag. Draw arrows to indicate the direction in which the water will move in each case.



A. \_\_\_\_\_



B. \_\_\_\_\_



C. \_\_\_\_\_

1. Intravenous solutions must be prepared so that they are isotonic to red blood cells. A 0.9 percent salt solution is isotonic to red blood cells.

A. Explain what will happen to a red blood cell placed in a solution of 99.3 percent water and 0.7 percent salt.

B. What will happen to a red blood cell placed in a solution of 90 percent water and 10 percent salt? Explain.

2. What keeps plant cells from bursting when they are placed in a hypotonic solution?

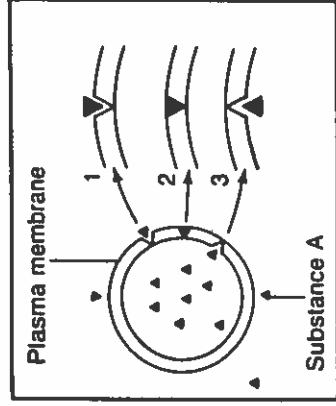
3. How does being placed in a hypertonic solution affect a plant?

- In regard to the solutions in the bags and in the beakers, what is meant by equilibrium? \_\_\_\_\_  
\_\_\_\_\_
- What happens to the motion of molecules after equilibrium is reached? \_\_\_\_\_  
\_\_\_\_\_
- What is turgor pressure in a plant cell? \_\_\_\_\_  
\_\_\_\_\_

## 7. ACTIVE TRANSPORT

Textbook reference: Sections 5-12 to 5-14

Active transport requires the use of carrier proteins to carry the molecules against the diffusion gradient. Energy is needed for the process. Study the diagram below, which shows a model of active transport. Then complete the accompanying paragraph, and answer the questions that follow.



Molecules of substance A are shown by triangles. This substance is in greater concentration \_\_\_\_\_ the cell. The notches in the plasma membrane represent \_\_\_\_\_ . The sequence 1-2-3 shows how a \_\_\_\_\_ aids the \_\_\_\_\_ of a molecule of substance A into the cell. This process requires the cell to \_\_\_\_\_ .

- How does passive transport differ from active transport? \_\_\_\_\_  
\_\_\_\_\_
- Contrast facilitated diffusion with active transport. \_\_\_\_\_  
\_\_\_\_\_
- Cells behave much like the cellulose bag. When such movements occur across the cell membrane, are they considered to be passive or active transport? \_\_\_\_\_  
4. How can a small particle or liquid droplet enter a cell? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- How does a large particle enter a cell? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_