

Upon completion of *Osmosis (WB)*, students should be able to:

1. Understand that molecules in a solution are equally likely to move in any direction.
2. Predict how concentrations of molecules on either side of a semi-permeable membrane will change over time when the concentrations are initially different.
3. Describe osmosis as a special case of diffusion.
4. Predict which side of a semi-permeable membrane will have higher pressure.
5. Define concentration as the amount of a substance in a particular volume or space.
6. Calculate solvent concentrations.
7. Describe what it means for a system to be at stable equilibrium.
8. Explain why, at higher temperatures, a system should equilibrate faster.
9. Define hypertonic, isotonic, and hypotonic, relative to a cell suspended in solution.
10. Explain that total solute concentration, and not total number of different solutes, is important for determining if a solution is hypertonic, isotonic, or hypotonic.
11. Design an isotonic solution of IV fluids, given the solute concentration of blood cells.

Students should also reduce their expression of the following misconceptions:

1. Motion is directed, and molecules "want" to move (or have some force pushing them) down their concentration gradient.
2. Equilibrium is static, and molecules stop moving once equilibrium is reached.
3. Equal *numbers* of solute molecules is the same as equal *concentrations*.
4. Solutes that differ in size impart different pressures.