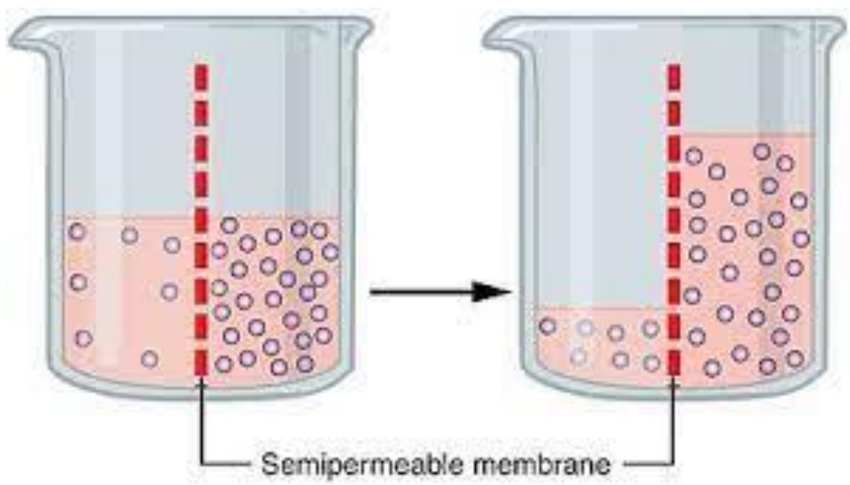
BIO 25 PAL Worksheet
Week 3 (#2): Osmosis

Remember

Although the membranes of animal cells are comprised of mostly fats, there are aquaporins (water channels) everywhere, so water will move where it wants. What dictates its movement? **Differences in osmolarity!**

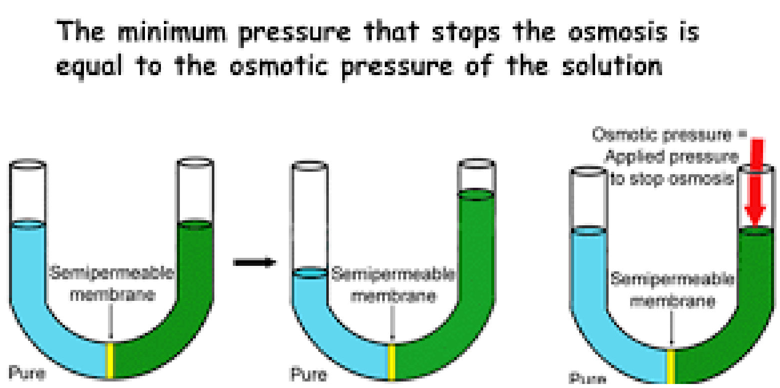


1. DRAW the situation above on your whiteboard; then, indicate how you could change the picture so that <u>less</u> water moves over. How could you change picture so that <u>more</u> water moves over?

2. Come up with a way that you could stop the net movement of water from left to right. Assume the membrane remains permeable to water.

Understand

3. ***Osmotic pressure***, is <u>the degree to which a solution is able to move water</u>. Thus, a _____________ (more/less) concentrated solution has <u>more</u> osmotic pressure; a _______________ (more/less) concentrated solution has <u>less</u> osmotic pressure.



Apply

In the human body, we discuss osmotic movement of water with relation to how cells change their shape when water moves in/out of them.

4. One of the dangers of "water intoxication", where someone takes in a large amount of water so rapidly that their kidneys cannot efficiently clear it, is brain swelling, which often leads to death. Describe how this might occur from the perspective of osmotic water movement.

5. Delivering chemotherapy drugs intravenously to brain tissue is difficult, because the cells that make up the capillary walls in brain blood vessels are so closely connected. This "blood-brain barrier" prevents the normal paracellular transport of materials (where things move through tiny spaces around the sides of the cells), and thus only allows things to travel through the cells that make up the capillaries to get to the other side. And, moving a foreign material <u>through</u> a cell is virtually impossible.

   One successful trick has been to infuse a hypertonic solution directly into the targeted brain blood vessel just before infusing the chemo solution. How could this work? DRAW your answer!