

How do molecules move across a membrane?

INITIAL IDEAS: (DO NOT TRY THIS AT HOME!) If a person drinks a large glass of very salty water, shortly after they will have diarrhea. Why do you think that is?

DIALYSIS TUBING

Follow the instructions at the Dialysis Tubing station to set up your experiment. Then fill out the data table below:

	Initial Mass	Final Mass	Change in mass	Percent change	Average Percent change
Group 1					
Group 2					
Group 3					
Group 4					

Draw a diagram of your experiment. Use arrows to show which direction water was moving.


ONION CELL


Set up a slide as shown and look at it under a microscope. Then add some salt water and record what happens. Draw your observations below:

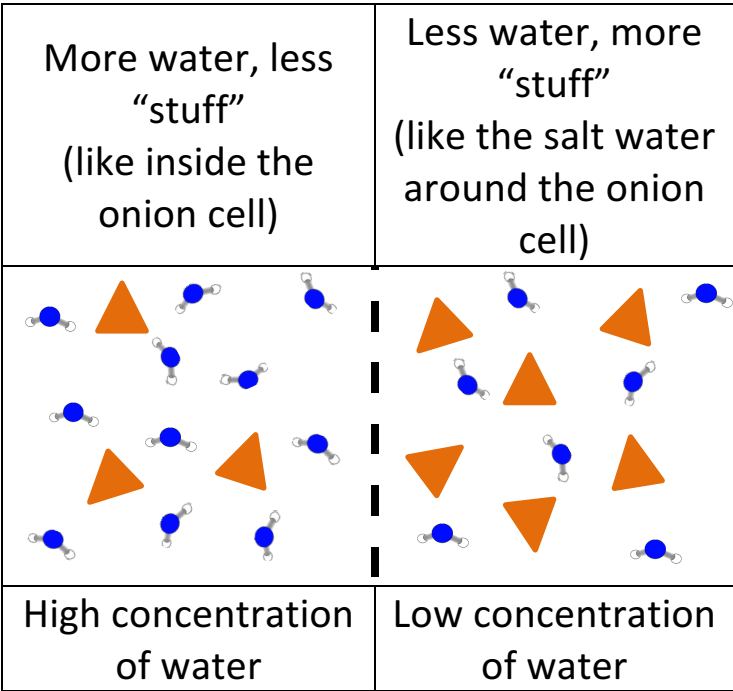
FRESH	SALT

SYNTHESIZING IDEAS

In both of these examples, one side of the membrane had a high concentration of water compared to the other side. Below is a diagram showing two sides of a membrane: one that has a relatively high amount of water, and one with a relatively low amount of water.

 Water molecule

 Solute (stuff inside the onion cell or bag)



For example, in the onion cell example, there was “stuff” inside the onion, but even more “stuff” outside the onion (because there was so much salt in the water). So the inside had a relatively HIGH concentration of water while the salt water outside the onion cells had relatively LOW concentration of water.

Another way to think of this: if you could taste the liquid on either side of the membrane, which side would taste more watery? This is the side that has a high concentration of water.

1. Which way does water move: Towards the side with more water, or the side with less water?
2. On the diagram above with the water molecules and triangles, draw an arrow to show which way the water moves.

READ:

Molecules are constantly moving, and will spread so that their concentration is equal throughout a given area. When something moves from an area of high concentration to low concentration that is called diffusion. In these activities, you saw how water moved from where there was relatively more water to an area with relatively less water. When water diffuses, it’s called **osmosis**. When other molecules move from an area of high concentration to low concentration, including glucose and carbon dioxide, it’s called **diffusion**.

EXTENSION QUESTIONS:

3. When you are exercising, your cells are converting glucose to carbon dioxide and water.
 - a. During your workout, is the concentration of CO₂ in your cells low or high compared to the blood around them?
 - b. Which way will CO₂ move? Into the cells, or into the blood?
4. After exercising, your body has converted a lot of the glucose in your cells to carbon dioxide and water.
 - a. After your workout, is the concentration of sugar in your CELLS low or high?
 - b. After your workout, you eat a plate of pasta (starch). 20 minutes later, will the concentration of glucose in your BLOOD be low or high?
 - c. Which way will the glucose move?
5. When plants get droopy, you can water them to “perk them up.” Using the words concentration and diffusion (or diffuse) explain why this works.
6. Look back at the initial question: why do you people get diarrhea when they drink lots of salt water?