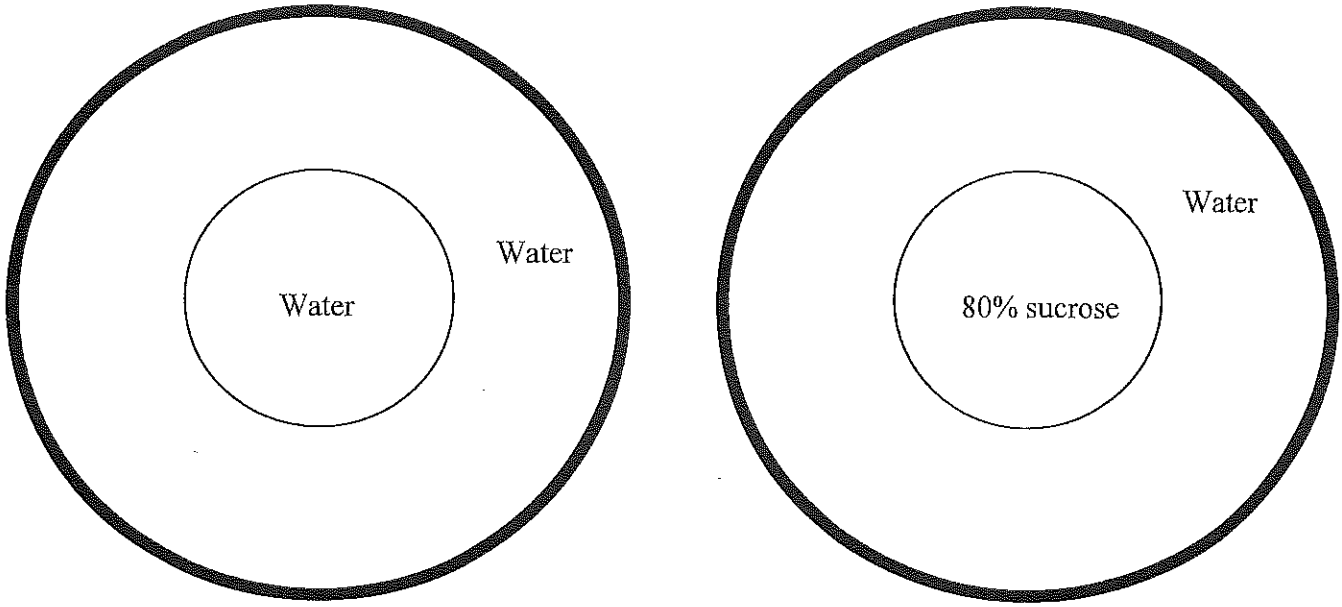
Name: Date: Class Period:



1) The diagram above shows the basic set-up for your two dialysis tubes (thick line = 250 mL beaker, thin line = dialysis tube). The dialysis tubing is semi-permeable; the pores in the tubing are large enough to let water move through the wall of the tube, but too small to allow sucrose to move through the wall of the tube. What do you predict will happen in the two tubes? What do you expect to see? Why will this happen?

2) How does the result of your experiment explain the diarrhea that occurs after cholera infection? (Remember that in our model system, the inside of the dialysis tube is equivalent to the inside of the intestine, and the sucrose we put inside the dialysis tube is equivalent to the salt which enters the intestine after cholera infection.)

3) Your job as physician is to stop the patient's diarrhea. This will literally save her life. Based on the simple dialysis experiment, what kind of treatment do you think would help the patient? How could you get water to move back into the patient's body instead of being lost as diarrhea?

Lab investigation: Osmosis
Cholera simulation

Per lab bench, there is one control set up and one experimental set up. (Half of the bench should set up one and half the other, in the interests of optimizing time.)

Note: Use only distilled water for this lab. 80% sucrose is pre-measured and in blue capped tubes beside the water jugs along the back wall of the lab.

For the following steps, please refer to the diagram below.

1. Get two lengths of water soaked dialysis membrane tubing. Twist the bottom and attach a clip.
2. For control tube, carefully measure 30 mLs of distilled water from the jug at the back of the classroom. Add the measured water to the dialysis tubing. It will be slippery!
3. Smooth out the tubing. Trim excess if needed. Place a straw along one edge and twist tubing around the straw. You want to minimize air inside the bag.
4. Secure the top of the tube around the straw by twisting a rubber band around the straw.
5. Place the set up with open straw into a 250 mL beaker. Cover the membrane with water (about 200 mLs).
6. Repeat the same procedure to set up your experimental tube, but instead of adding distilled water to the inside of the membrane, add 80 % sucrose (premeasured in blue capped tubes)
7. Once the sucrose tube is set, mark the time and return to your desk for further instructions. Check your set up about every 10 minutes and note any changes.
8. At the conclusion of your experiment, please rinse the straws and all glassware, in the sink and return them to the bucket. Wipe your bench.