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Lab 8: Osmosis
Effect of Solute Concentration on the Cell

Materials:

Pick Up at Beginning of Lab	On Lab Tray	Must Be Replaced at End of Lab!
45cm of dialysis tubing	Scissors Ruler Six small rubber bands Four bowls (labeled 0%, 10%, 20%, 30%) Beaker full of sugar Erlenmeyer flask of blue UNKNOWN Pipette (put ONLY in UNKNOWN) Spoon (DO NOT PUT IN ANY WATER!) Stirring stick Forceps 100mL graduated cylinder Large beaker (to fill with tap water) Small beaker (to measure sugar mass) Triple beam balance Timer (phones are fine!)	Rubber bands if broken More sugar if needed More blue unknown solution if needed

Instructions:

1. In Part A, skip to the hypotheses section. Hypothesize the outcome of the experiment with your lab group.
2. Answer #4 to determine the outcome of the experiment.
3. Make your sugar solutions (two people can work on this while two people work on step 4!)
    A. For 0% sugar solution:
        1) Measure 200mL of tap water and pour into 0% bowl
    B. For 10% sugar solution:
        1) Measure 200mL of tap water and pour into 10% bowl.
        2) Measure the mass of the EMPTY small beaker (note this in your solutions table).
        3) Add 20g to this mass (note this in your solutions table).
        4) Move the riders of the triple beam balance to the mass of the empty beaker + 10g of sugar. (For example: if the empty beaker is 7g and you need to measure 10g of sugar, you would move the riders to 17g)
        5) Carefully spoon in small amounts of sugar until the balance reaches zero (or is balancing at the zero line), which will indicate you have achieved 10g of sugar!
        6) Stir until all sugar granules are dissolved (someone could do this while someone else continues on to the 20% solution!).
    C. For 20% sugar solution:
        1) Measure 200mL of tap water and pour into 20% bowl.
        2) Repeat the same steps from the 10% solution instructions, but this time add <u>40g</u> to the beaker mass.
    D. For 30% sugar solution:
        1) Measure 200mL of tap water and pour into 30% bowl.
        2) Repeat the same steps from the 10% solution instructions, but this time add <u>60g</u> to the beaker mass.
4. Make your dialysis tubing "cells" (two people can work on this while two people work on step 3!)
    A. Lay out your 60cm strip of dialysis tubing flat on your table.
    B. Measure 15cm and cut the tubing. Measure another 15cm and cut the tubing. And do this one more time. You should now have four 15cm pieces.
    C. Collect the large plastic beaker and approximately ¾ of the way with tap water.

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D. Dip the one strip of dialysis tubing in the large beaker filled with tap water. Remove with the forceps (tweezers) after about 10 seconds. Tubing should be softened.
E. Twist one end of the tubing so no water could leave the end of the tubing. Tightly wrap a small rubber band around the end.
F. On the opposite end of the tubing, rub between your thumb and forefinger to try to separate the two sides of the tubing to open it up. You can use the plastic pipette to help open it.
G. Using the plastic pipette, carefully fill the dialysis tubing with the blue UNKNOWN sugar concentration solution. The tubing should fit about two pipettes full of unknown solution.
H. Carefully twist the open end of the dialysis tubing enough that no liquid will leak out. Tightly wrap a small rubber band around the end.
I. Gently squish the dialysis tubing "cell" to see if any liquid comes out either end. If it does, tighten your twists and rubber bands.
J. Repeat steps D through I using the other two strips of dialysis tubing.

5. Measure the mass of one of the dialysis tubing "cells". Note the mass in your data collection table in the "Before" column. Set this "cell" next to the 0% bowl (not in it!) so it doesn't get mixed up.
6. Repeat step 5 for the other three "cells" setting them next to the 10%, 20%, and 30% bowls separately.
7. Have a timer set for 20 minutes ready.
8. Set one dialysis tubing "cell" per bowl and start the timer.
9. After 20 minutes have passed, remove the dialysis tubing cell in the 0% sugar concentration bowl
   (Do NOT remove the other two "cells" from their bowls until you are reading to measure their masses! You don't want the tubing to dry out!)
10. Quickly measure the mass of the 0% dialysis tubing "cell" and note it in the "After" column.
11. Repeat step 10 for the 10% "cell", for the 20% "cell", and lastly for the 30% "cell".
12. Throw away the "cells" in the garbage and dump out the bowls rinsing them thoroughly.
13. Replace any materials that need to be replaced.
14. Reset your lab tray neatly ensuring that all items are present.
15. Finish your calculations in your data table, create your graph, and answer your analysis questions. Don't forget to answer the rest of your pre-lab questions too!