



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Jeffrey B. McClenahan</b>  | <b>Project Number</b><br><br>22600 |
| <b>Project Title</b><br><b>The Sugar Osmometer</b>  |                                    |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>The objective of my experiment was to determine if the concentration of sugar in a dialysis tubing 'sausage' affected the rate at which water diffused into the 'sausage' to create equilibrium.<br><b>Methods/Materials</b><br>I gathered together my materials, and washed them thoroughly. Next I filled the mason jars about three-fourths full, and set them aside. Then I measured out the sugar to approximate percentages of 200ml of water. After I measured out the quantities of sugar I dissolved them in the 200ml of water, and label them. I then tied the dialysis tubing onto the silicone tubing with the dental floss, and also tied the bottom of the dialysis tubing to form a 'sausage'. I next poured the sugar solution down the silicone tubing and into the 'sausage'. I then got out some Benedicts solution and made sure there was no sugar in the mason jar before I lowered the 'sausage' into the jar. Finally I marked where the sugar water started in the osmometer with the Sharpie pen. Lastly I waited and recorded my results.<br><b>Results</b><br>My results are in two sets. My first set of data was recorded after 12 hours. This first set of data was not that accurate. This could be expected though, because many technical and uncontrollable factors could happen. This is mainly why my first set of results is so hard to figure out, but it was still important to my objective. This first set of data showed me some of what could go wrong and how I could correct it. Although hard to interpret, in my first set of data the osmometer with the 30% sugar solution, went up 1 1/2 inches in 12 hours, the osmometer with the 45% sugar solution went up 24.5in, and the osmometer with the 60% sugar solution went up 24in. My second set of data proved my hypothesis. Not as many inaccuracies occurred over the shorter time period.<br><b>Conclusions/Discussion</b><br>My second set of data/results proved my hypothesis to be correct. I reached my objective and proved that the higher the concentration of sugar in the dialysis tubing, the faster the water would diffuse into to the 'sausage' to create equilibrium. |                                    |
| <b>Summary Statement</b><br>I used a home made osmometer to determine if higher concentrations of sugar resulted in higher rates of diffusion.  |                                    |
| <b>Help Received</b><br>My father helped me set up the osmometer and helped me edit some writings. My teacher, Mr. Swanner, loaned me some materials I needed (Benedicts solution, dialysis tubing, support, test tube clamp, and ring clamp).  |                                    |