



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Sofia L. Donovan</b>	<b>Project Number</b> <b>J1806</b>
<b>Project Title</b> <b>Refraction and Salinity</b>	
<b>Objectives/Goals</b> My project is asking what the effect of the addition of salt is on the angle of refraction through water. Before I began my experiment, I hypothesized that if the concentration of salt is increased, then the angle of refraction through the water will increase as well.	
<b>Abstract</b> Cut off the top and two sides of a cardboard box, giving me a small compartment in which to do my experiment. Draw two perpendicular lines on a sheet of paper and align an open glass box filled with 440 mL of water with one of the lines, keeping the box center to the other line. Line up the laser pointer from an angle so that it enters the box at the line opposite to the glass box. Use a pen to mark where the laser pointer should enter every time. Shine the laser into the glass box at the correct point and make a dot with a colored marker on the paper where the laser emerges from the opposite side of the glass box. Add 40 grams (10% salt concentration) to the water and repeat step 4, but using a different colored marker. Add another 40 grams (20% salt concentration) and repeat step 4, then add another 40 grams (30% salt concentration) and repeat step 4, all the way up to 100% salt concentration, using a different colored marker for each percentage of salt concentration. Remove the paper and replace it with a new one and repeat steps 2 and 3. Complete 10 trials of steps 3, 4, 5, 6 and 7. When you finish all 10 trials, draw lines from the colored dots to the point where the two perpendicular lines meet. Then measure the angle for each dot on each paper and record it on your data table.	
<b>Methods/Materials</b> Materials: open glass box, 440 mL of water, 1 laser pointer, Ruler, Colored markers, Cardboard box, Table Salt, Spoon, Protractor, Pencils, Pens	
<b>Results</b> My data and graph show that the angle of refraction decreased on an average of .96 degrees each time the concentration of salt increased. I was surprised by this. My graph shows a linear relationship.	
<b>Conclusions/Discussion</b> I hypothesized that if salt is added to water, then the angle of refraction through the water will increase. My hypothesis was incorrect. The angle of refraction decreases as the concentration of salt increases.	
<b>Summary Statement</b> This project measures the impact of salinity on the refraction of light while shining a laser pointer through salt water.	
<b>Help Received</b> Mother purchased materials and clarified what I didn't understand.	