



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Rae J. Holcomb</b>	<b>Project Number</b>  31712
<b>Project Title</b> <b>Sweetness and Light</b>	
<b>Objectives/Goals</b> The objective was to determine how the density of a sugar-water solution and the color of laser light shone through the solution affect the angle of deflection of the light. <b>Abstract</b> <b>Methods/Materials</b> Light from red, green, and blue lasers was shone through a sugar-water solution contained in a square glass vessel and onto a backboard behind it. This was done for four different concentrations of sugar-water, each repeated for three trials. The change in position of the spot of light on the backboard was measured and used to calculate the angle of deflection of the light. <b>Results</b> The angle of deflection was greatest for the red laser, intermediate for the green laser, and the blue laser deflected the least. The solution with the highest concentration of sugar had the smallest angle of deflection. As the solutions became less concentrated, the angle of deflection increased. Of all the solutions, the plain water solution with no sugar had the greatest angle of deflection. <b>Conclusions/Discussion</b> I had hypothesized that the angle of deflection would be greatest for the red laser, intermediate for the green laser, and smallest for the blue laser. My experiment proved this to be true. I had also hypothesized that as the concentration of the sugar-water solution increased, the angle of deflection would also increase. It turned out that as the density of the liquid increased the angle of deflection decreased. This was because as the concentration of the solution increased, the difference of the density between the liquid and the glass decreased, which meant that the light beam experienced less displacement due to refraction.	
<b>Summary Statement</b> My project is about the refraction of different colors of laser light through different concentrations of sugar-water solutions.	
<b>Help Received</b> Dad supervised safe usage of lasers during experiment. Mom helped assemble backboard. Neighbor donated equipment.	