



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> Aileen J. Fletcher	<b>Project Number</b> <b>J1605</b>
<b>Project Title</b> <b>Refraction: Density's Child</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of my project is to show that the density of various liquids affects the refractive ability of light, or index of refraction. I believe that liquids with more additives will refract light to a greater degree.</p> <p><b>Methods/Materials</b> A hollow prism was made by cutting a microscope slide with a glass cutter, bonding the 3 sides with epoxy, and then attaching the hollow prism onto another microscope slide. 5 different liquid solutions were used: Plain water, water with 5%, 10% and 15% sugar concentrations, and ginger ale. The index of refraction was measured by using a laser pointer. The beam of the laser pointer was set to go through the prism filled with the various liquid solutions, with points where the beam hit the perpendicular wall and parallel table marked with a pencil. These various points and measured distances were plugged into a formula to determine the index of refraction for the different liquids. Three trials were performed for each liquid.</p> <p><b>Results</b> Ginger ale had the highest index of refraction, and was also the densest of all the liquids. The results showed that the higher the density, the greater the index of refraction.</p> <p><b>Conclusions/Discussion</b> My conclusion is that density does affect the indices of refraction of different liquids. The understanding of how to measure sugar content can be important, especially to diabetics, because product labels may not always portray accurate sugar content. In the future, a device similar to the one in my project could be developed, and be extremely beneficial to society.</p>	
<b>Summary Statement</b> My project shows how the density of various liquids affects the refractive ability of light.	
<b>Help Received</b> Mother helped buy equipment; Father helped me with trigonometry.	