



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Chris Kim	Project Number S0621
Project Title Finding the Sugar Concentration of a Solution	
Abstract Objectives/Goals My objective was to observe if there is the relationship between the index of refraction and the concentration of a sugar solution and to use the angle of refraction to estimate the amount of sugar in unknown drinks by making an equation. Methods/Materials A container with sides of four microscope slides with the length of 7cm on each side was created. A laser pointer was set to enter the container to enter at 40 degrees, and the angle of refraction could be measured. The angle of refractions in 5%, 10%, and 15% concentration sugar solutions was measured, and each experiment was repeated six times. The index of refraction of these 3 sugar solutions was calculated by using Snell's Law. Finally, an equation was made from the collected data. Using this equation, the angle of refraction was measured in unknown drinks, and the sugar concentration was estimated. Results On the 5% sugar concentration, the average index of refraction was measured 1.332. On the 10% sugar concentration, the average index of refraction was measured 1.348. On the 15% sugar concentration, the average index of refraction was measured 1.358. From this collected data, the equation was sugar concentration = 3.6009*index of refraction - 4.7472. On Gatorade, the average index of refraction was measured 1.34. On Green tea, the average index of refraction was measured 1.33. On apple juice, the average index of refraction was measured 1.348. Conclusions/Discussion I believe that the result of my hypothesis supported my hypothesis. I found that as the sugar concentration increases, the index of refraction also increases. There are many people who are interested in the amount of sugar in what they drink. I hope my experiment can lead to a method to easily find out the concentration of sugar in unknown drinks.	
Summary Statement The concentration of sugar in a solution was estimated by measuring the refraction of light entering the solution.	
Help Received None	