



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Thomas P. de Lyon	Project Number J1505
Project Title Polarimetry: Measuring the Optical Activity of Sugars	
Abstract Objectives/Goals I wish to measure the optical activity of various sugars and artificial sweeteners, both in their pure form and in food products. I would like to find out the similarities and differences between the optical activity of these sugars and artificial sweeteners. Methods/Materials I built a simple polarimeter using a light bulb, color filters, polarizing filters, and a sample cell. I prepared 100 - 200mm long columns of water solutions of sugars (sucrose, fructose, dextrose, and lactose), artificial sweeteners (aspartame, sucralose, and saccharin), or food products (sodas, syrup, wines, and jello). I measured the optical rotation of the sugars in solution by rotating the analyzer in the polarimeter until no light was transmitted. Results I found that the optical activity of sugars and artificial sweeteners can be measured and that the wavelength of the light, the solution concentration, and the liquid column height all change the amount of optical rotation. I also found that artificial sweeteners had much stronger optical activity than sugars. Finally, I discovered that sugars in gelatins behave like sugars in water and that the optical activity of dextrose can change with time. Conclusions/Discussion All the common sugars and artificial sweeteners are optically active, while the artificial sweeteners had much stronger optical activity than sugars. These results mean that polarimetry is a useful way of measuring the content of sugars or artificial sweeteners in beverages and food products.	
Summary Statement My project is about using polarimetry to measure the optical activity of sugars and artificial sweeteners.	
Help Received My father helped me with getting the supplies, constructing the polarimeter and mixing some of the solutions.	