



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Stephanie R. Debats</b>	<b>Project Number</b> <b>S0502</b>
<b>Project Title</b> <b>Effect of Concentration and Temperature on the Optical Rotation of Aqueous Solutions of Sucrose, Fructose, and Glucose</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The purpose of this experiment was to determine how the optical rotation of aqueous solutions of sucrose, fructose, and glucose is affected by concentration and temperature. Optical rotation is caused by the chiral properties of these three sugar molecules. The hypothesis was that as the concentration or the temperature of the solutions increased, the optical rotation would also increase. <b>Methods/Materials</b> A polarimeter was used to measure the optical rotation of a beam of polarized light projected through solutions of sucrose, fructose, or glucose at various temperatures or concentrations. <b>Results</b> As the concentrations of the all three sugar solutions increased, the optical rotation also increased. As the temperature of the solutions increased, the optical rotation increased for sucrose and decreased for fructose and glucose. <b>Conclusions/Discussion</b> There is a direct correlation between concentration and optical rotation. As concentration increases, the number of molecules possessing chiral properties also increases, resulting in greater optical rotation. The relationship between temperature and optical rotation is less distinct, requiring further investigation.	
<b>Summary Statement</b> This project is an investigation of the chiral properties of sugars and the factors affecting the optical rotation of sugar molecules in aqueous solution.	
<b>Help Received</b> I borrowed laboratory equipment from my school, Woodbridge High.	