



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.) Paul E Norton	Science Fair Use Only <h1 style="margin: 0;">J0425</h1>
Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) Synergetic Effect Between Glycerin and Sugar on the Size and Lifetime of Soap Bubbles	Division <input checked="" type="checkbox"/> Junior (6-8) <input type="checkbox"/> Senior (9-12)
Preferred Category (See page 5 for descriptions.) 4 - Chemistry	
Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p>OBJECTIVE: My objective is to determine if there is a synergetic effect between the addition of glycerin and the addition of sugar on the size and lifetime of soap bubbles. I believe that there will be a synergy.</p> <p>MATERIALS AND METHODS: I built an experimental device to make flat soap bubbles with a maximum height of 210 cm. A rectangular flower box contained the soap solution. A piece of wooden broomstick was immersed in the soap solution and was raised by a motor along two plastic ropes up to a beam in my garage, forming a rectangular flat bubble. The soap was Ultra Palmolive dishwashing. The additives were glycerin and granulated sugar. In my experiment, I designed a matrix with 5 concentrations of glycerin and 5 concentrations of sugar to explore all possible 25 combinations in random order.</p> <p>RESULTS: When I made my experiments, I realized that the air moisture was changing my results. I had to correct my data for the decrease in air moisture during the day. I found that glycerin had a positive effect on the size and lifetime of soap bubbles, while sugar had a negative effect.</p> <p>DISCUSSION: Not only sugar had a negative effect on soap bubbles, it also canceled the positive effect of glycerin, showing an antagonism between the two additives. This was contrary to my hypothesis. In my literature review, most authors used corn syrup. I used granulated sugar, thinking it was the same, but I suspect sugar did not dissolve well, which may explain its negative effect. The influence of the changes in air moisture during the day could have been avoided if I had made my experiments in an air-conditioned room to control air moisture.</p>	
Summary Statement (In one sentence, state what your project is about.) The goal of my project was to determine if there was a synergy between glycerin and sugar on the size and lifetime of soap bubbles, in order to concoct an inexpensive soap solution that would make bubbles large enough to fit my sister in.	
Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. My dad helped me with the 3D graphics and taught me how to do a linear regression on Excel. My Mom did the proof reading of my notebook.	