



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2000 PROJECT SUMMARY

Your Name (List all student names if multiple authors.) Paul E. Norton	Science Fair Use Only
Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) Which Additive Increases the Most the Size of Soap Bubbles?	J0416
	Division J Junior (6-8) J 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. Objective: My objective is to determine which of several additives will increase the most the size of soap bubbles. I believe that glycerin will be the most effective additive. 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 slid 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, granulated sugar, and gelatin. In some cases, several trials were reaching the maximum height of my device and I had to measure the time the bubble lasted to see the difference between them. Results: The best soap concentration was 9.4%. Sugar and glycerin had about the same and best effect on the bubble size (33% increase), however bubbles made with glycerin lasted longer (100% increase in lifetime versus 25% increase for sugar). Discussion: Both sugar and glycerin had a positive effect on bubble size. However, the strongest effect observed in this experiment was a doubling of the lifetime of bubbles made with glycerin. This confirms what I found in my literature review that the main effect of additives on soap bubbles is to slow down the drying process. My hypothesis was partly correct because I found that both sugar and glycerin increase the most the size of soap bubbles, but if I take the lifetime in consideration, glycerin is a better additive than sugar.	
Summary Statement (In one sentence, state what your project is about.) The goal of my project was to determine which additive has the best effect to make soap bubbles large enough to fit my little 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 to sort all the different concentrations I found in my literature review. He also taught me to do graphs with two axes on Excel. My mom did the proof reading of my notebook.	