



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

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<b>Project Title</b> Wetter Water: A Comparison of the Surface Tension Reducing Ability of Shampoos and Dishwashing Detergents	
<b>Abstract</b> <b>Objectives/Goals</b> My goal was to determine whether shampoos or dishwashing detergents would be more effective at reducing the surface tension of water. My hypothesis was that dishwashing detergents would reduce surface tension more effectively than shampoos. <b>Methods/Materials</b> I tested several dishwashing liquids and shampoos to see how much of each it took to sink a needle floating on 500 ml of water. I added the shampoo (or detergent) 0.1 ml at a time until the needle would no longer float. After each 0.1 ml, I stirred the water thoroughly and waited several minutes before trying to float the needle. I washed and dried the needle after each test and made sure to use fresh water at the same temperature for each cleaner tested. I recorded the results in my lab book and figured the average for shampoos and dishwashing detergents. <b>Results</b> On average, it took less dishwashing detergent to reduce the surface tension enough to sink the needle than shampoo. Some shampoos were strong enough to sink the needle at the same concentrations as some dishwashing detergents but on average greater amounts of shampoo were needed. <b>Conclusions/Discussion</b> The hypothesis was correct. In general dishwashing detergents are more effective at reducing the surface tension of water than shampoos. This may be because dishwashing detergents are formulated to "cut grease" and leave dishes "sparkling clean" while shampoos are formulated to be "gentle" and not strip your hair and scalp of "essential oils."	
<b>Summary Statement</b> My project tested and compared the respective surface tension reducing abilities of several shampoos and dishwashing detergents.	
<b>Help Received</b> My mom drove me to the library to do research. My dad bought shampoos and detergents and loaned me his old college chemistry texts. He also answered my questions about chemical bonds, surface tension, hydrogen bonding, polar and nonpolar molecules, and surfactants.	