



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jaimie Murayama; Lily Tang</b>	<b>Project Number</b> <b>S0519</b>
<b>Project Title</b> <b>How Do Cleaning Agents Affect Fabrics Colorfastness, Surface Texture, and Strength?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To determine which cleaning agent will deteriorate fabric the most and the least in colorfastness, surface texture, and strength. If fabrics deterioration is related to the cleaning agent, then sodium hypochlorite will cause the fabric to deteriorate the most and liquid Tide laundry detergent in Clean Breeze will cause the fabric to deteriorate the least.</p> <p><b>Methods/Materials</b> We used four different cleaning agents for our experiment: sodium hypochlorite, liquid Tide laundry detergent, Dawn dishwashing soap, and sodium lauryl sulfate. We used a 6% concentration of each of the cleaning agents. Then, we developed four dilutions of the agent: 100%, 75%, 50%, and 25%. We placed 5 strips of black fabric in each dilution for 30 minutes. We rinsed the fabric and set it out to dry. Then, we repeated the experiment again for a second trial. We tested the fabrics colorfastness by comparing the tested fabric pieces to the original. Then, we tested the fabrics surface texture by comparing the surface texture of the tested fabric to the original under a microscope. To test the strength of the fabric, we placed weights on the end of each fabric strip until the razor blade in the center began to cut.</p> <p><b>Results</b> In colorfastness, all the fabrics remained the same color as the original except those soaked in sodium hypochlorite. The ones in sodium hypochlorite turned into various shades of salmon pink; the higher the concentration the lighter the color. In surface texture, the ones in sodium hypochlorite had longer strands sticking out all over the place; all the others had short strands sporadically sticking out. In strength, all the strips of fabric took approximately 1,250 grams of weight for the fabric to begin cutting.</p> <p><b>Conclusions/Discussion</b> In conclusion, we found that our hypothesis was partially correct. The sodium hypochlorite did deteriorate the fabric the most in colorfastness and surface texture, but not in strength. Also, Tide did not deteriorate the fabric the least because the results gathered from it were similar to the results from the other cleaning agents.</p>	
<b>Summary Statement</b> We found that sodium hypochlorite deteriorated the fabric the most in colorfastness and surface texture, but not in strength; the Tide laundry detergent did not cause the fabric to deteriorate the least.	
<b>Help Received</b> This experiment was made possible with the assistance of our chemistry teacher Ms. Wright and the chemistry lab at Notre Dame High School.	