



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Luke D. Van Houten	Project Number J1135
Project Title Effectiveness of Sunblocks in Reducing UVA Exposure: Sprays vs. Lotions	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Last summer, my mom was severely burned after applying spray sunblock. That same day, my father, sister and I were not burned at all after using lotion sunblock. The purpose of this project was to compare the effectiveness of lotion and spray sunblocks in blocking UV rays that might cause sunburn and other forms of skin damage. I believed that the lotion sunblocks, Coppertone SPF 30 Lotion and Coppertone Waterbabies SPF 45 lotion would be more effective than spray sunblocks (Coppertone SPF 30 spray and Coppertone Waterbabies SPF 45 spray) at blocking UV rays.</p> <p>Methods/Materials I constructed a device from a box that had all of its top flaps removed. I inserted a paper towel roll for the purpose of viewing. I placed UVA detecting beads and a UVA/B detector inside the box. The UVA detecting beads emit colors when exposed to ultraviolet light at about 365 nm. I coated one side of a sheet of acrylic plastic with the sunblock being tested. Then I placed the acrylic with sunblock on the top of the box and took it outside. After the box was outside, I timed for one minute and recorded the results. I did this 32 times (8 trials for each sunblock).</p> <p>Results When I tested with the sunblock lotions, the color-changing beads never turned their brightest shades, and only two colors of beads showed any color at all (the blue and purple beads). When I tested with the spray sunblock, the blue and purple beads turned bright blue and purple. Orange beads also changed color. Even some pink beads began to show color. Unfortunately, the UVA/UVB detector, although not inexpensive, was not high quality enough, not sensitive enough, to give many readings when either spray or lotions were used. I also tested with just the acrylic plastic (no sunblock) as a control. When I tested the controls, the bead colors exhibited included blue, purple, pink, yellow and orange. I timed the beads# response from when I unveiled them to the sun to the point when they reached their full colors. In the control trials the beads took only approximately 5 seconds to reach their full colors.</p> <p>Conclusions/Discussion Based upon the results of my tests, the sunblock sprays and lotions were both able to block UVA rays. However, the sunblock lotions appeared to be much more effective in blocking UVA rays than the sunblock sprays. I would recommend sunblock lotions be used to prevent sun damage and not sunblock sprays.</p>	
Summary Statement This project tests the effectiveness of sunblock lotions versus sunblock sprays in blocking UVA rays.	
Help Received I would like to thank my family for their wonderful assistance and support. I would also like to thank my science teacher for her ideas and suggestions. Lastly, I would like to thank the Mintz family for allowing me to borrow their UV detector for my experiments.	