



CALIFORNIA STATE SCIENCE FAIR 2006 PROJECT SUMMARY

Name(s) Kenneth D. Flatman	Project Number J1413
Project Title Does Higher Sunscreen SPF Matter?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to learn whether there is a significant difference in the protection given against UV rays by sunscreens at SPF 30 and up. My hypothesis is that there won't be a significant amount of difference in the protection given by sunscreens with higher SPF levels.</p> <p>Methods/Materials This experiment uses a paper called Sunprint paper (created by Lawrence Hall of Science) that turns blue when exposed to UV rays. Ten sunscreens were smeared over a clear acrylic sheet that came with the Sunprint kit and were exposed to 5 minutes, 4 minutes, and 2 minutes of sunlight. After stopping the Sunprint paper's chemical process with water, I scanned the dried Sunprint paper into the computer and used the GIMP graphics program to take samples of the Sunprint paper blue pixel value to get an average darkness for each sunscreen and time interval.</p> <p>Results The sunscreens gave roughly the same amount of protection against UV rays, with the SPF 60 sunscreen giving a little more protection. Regardless of SPF, the sunscreens with physical blockers Zinc Oxide and Titanium Dioxide gave the most protection, whereas the sunscreens with the active ingredient Avobenzone did the poorest. The sunscreens with Avobenzone were less dense than the other sunscreens, so I conducted a follow-on experiment to determine whether density played a key role in my results. The experiment used columns with no sunscreen, white Lubriderm lotion (no SPF), the experiment's least dense (clear) sunscreen (SPF 30 that did the worst), and the experiment's most dense sunscreen (SPF 60 that did the best). The denser lotion provided a little more protection than no sunscreen but did not perform nearly as well as the clear (less dense) sunscreen.</p> <p>Conclusions/Discussion There wasn't a visible difference in the protection given against UVB rays by sunscreens at SPF 30 and up. However, sunscreen SPF doesn't accurately define the amount of protection given from UV rays, because SPF only measures UVB protection. Because sunscreens with Avobenzone didn't perform well, the best sunscreens to buy should have an SPF of 30 or above and Zinc Oxide to protect against UVA1 rays. Future experiments could test the stability of sunscreens with Avobenzone to see why these sunscreens did poorly.</p>	
Summary Statement This experiment tests whether the FDA proposal to label higher SPF level sunscreens as "30+" adequately defines the amount of protection from the sun's UV rays.	
Help Received My mother typed in raw data, took pictures, and helped with the charts.	