Abstract – Anna Hansen

Project Title: Are You Protected?
Project ID: 60

When I vacation, I always get sunburned! I am interested in understanding what method of skin protection is best for sun exposure so I can enjoy my vacations more without a sunburn. Other kids can benefit from my experiment by knowing what to wear when doing outdoor activities like swimming, riding your bike, or anything under the sun.

This project investigates the effectiveness of sunscreens being dry outside versus in water outside. What type of applications of sunscreens perform best for either dry or wet conditions and how the age of the sunscreen affects the protection? Another goal of this project is to determine if you need to wait fifteen to twenty minutes before jumping in a pool or going outside under the sun. This project also investigates how sunscreens compare to clothing such as rash guards and tee shirts.

To solve the problems, I collected UVA and UVB over a three-hour period while the sun was shining between the times of 11:00 am and 3:00 pm. I started with just the UVA and UVB sensor pointing straight at the sun to get our baseline UVA and UVB data. Next, I used our control which was only an overlay (without any sunscreen) to get baseline data. I then applied sunscreen to a transparency and immediately placed over the sensor and collected the UVA and UVB data. For the wet locations, I first tested a wet transparency as a control. Next, I put sunscreen on the transparency and immediately dipped in water then collect the data. Then the transparency went back into the wet container. For the rash guard and white tee shirt, I stretched the shirt as if I was wearing it over the PVC and collected the data.

Our data indicates the age of the sunscreen was the biggest factor in protecting a person from the sun. Older sunscreens don't protect as well against the UVA sun rays which strike farther into a person's skin than the UVB rays. I found that brand isn't as important as the ingredients found in the sunscreen. I found that the sunscreens Blue Lizard and Neutrogena Sheer Zinc performed best for UVA in both wet and dry environments because they contained Zinc Oxide. Another result is that you do not have to wait after you apply sunscreen to enter a pool, lake or the ocean. Finally, the data shows that white tee shirts and rash guards provide just as good of protection from the sun in both categories of wet and dry for both UVA and UVB.

The main conclusion I arrived at is to wear a rash guard or white tee shirt whenever possible to protect from the sun. My experiment shows it provides just as good of protection to both UVA and UVB rays as the best sunscreens and it doesn't lose effectiveness with time. Secondly, you don't have to wait to enter water after sunscreen is applied. It works right away as long as the sunscreen is not old. Finally, if sunscreen is to be used, old sunscreen should be avoided as it did not provide as good of protection as newer containers. Also, when choosing a brand, pick the ingredients of Zinc Oxide or Titanium Oxide.