



# CALIFORNIA STATE SCIENCE FAIR 2002 PROJECT SUMMARY

<b>Name(s)</b> <p style="text-align: center;"><b>Matthew Ira Bohrer</b></p>	<b>Project Number</b>        <p style="text-align: right;">22233</p>
<b>Project Title</b> <p style="text-align: center;"><b>The Effect of Eye Color on the Ability to Distinguish Between Colors in Low Light</b></p>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b>  My objective was to determine whether or not there is a difference in the ability of people with different eye colors to distinguish between the primary colors at different levels of light.</p> <p><b>Methods/Materials</b>  I tested 100 subjects who were identified as NOT being "color blind" according to an Ishihara Test for Color Blindness. I went about my testing by having each person look into a black box that had a book light inside. Mounted on the inside back wall of the box was a card with the three primary colors. There was a viewing slit cut in the front of the box. Placed inside the box and behind the viewing slit was a piece of card stock with seven viewing slits cut in it, each with layers of neutral density filters taped behind them. Neutral density filters are light filters which lower the amount of light seen without changing the color of the light. There were seven different levels of filters for the subjects to look through and they were numbered from one to seven, with one being the darkest and seven being the lightest. The subjects looked through the darkest shade and told what they could see, then through a lighter shade, and then a still lighter shade until the subjects had seen all three primary colors or there were no more slits with filters to look through. For each subject I recorded their eye color and the level at which they were able to distinguish each of the three colors.</p> <p><b>Results</b>  I found that the percentage of people with brown eyes who could distinguish the colors in the lower levels of light was higher than the percentage of people with blue and green eyes who could. The difference between brown- and green-eyed people approached statistical significance (<math>p = .0530</math>) for the color red.</p> <p><b>Conclusions/Discussion</b>  Darker eye color may help people see darker colors, such as red, at low levels of light. Further research on this relationship would be useful.</p>	
<b>Summary Statement</b> For this project I tested 100 people to determine whether or not there is a difference in the ability of people with different eye colors to distinguish between the primary colors at different levels of low light.	
<b>Help Received</b> Father discussed different possible topics with me; mother helped type and assemble report and get various materials; lighting designers helped identify the filters to use to reduce the amount of light without changing color.	