



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> Alastair C. Macmillan	<b>Project Number</b> <b>J2216</b>
<b>Project Title</b> Where Are My Sunglasses? I Can't Stand the Glare!	
<b>Abstract</b> <b>Objectives/Goals</b> To discover which type and color of sunglass lens, out of brown and grey, polarized and non-polarized, reduced glare the most. <b>Methods/Materials</b> Photos were taken through the four lens types, at six locations, using a digital Nikon D200 SLR camera. The photos were analyzed using a histogram in Photoshop, to show the spread and the average of the brightness of the pixels, in the photos. The mean and the standard deviation from each photo was used to calculate the amount of glare and average light present in comparison to the control photo. <b>Results</b> The brown polarized sunglass lens consistently gave the lowest mean and standard deviation when compared against the control photos. The non-polarized lenses let through the most glare in all situations. <b>Conclusions/Discussion</b> My conclusion is that color and polarization are important factors in reducing glare, especially in high glare situations like reflections from water. The brown color was also effective in reducing light levels in very bright situations. The experiment also came up with a way to quantify glare by evaluating the histograms, which analyzed the mean and standard deviation of the luminosity of each photo. Comparing these results against the control gave us the reduction in light levels.	
<b>Summary Statement</b> My project seeks to discover which type and color of sunglass lens, out of brown and grey, polarized and non-polarized, reduces glare the most and how to quantify glare.	
<b>Help Received</b> My Dad taught me how to use the camera and taught me the math and my Mom helped me do the display board.	