



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> Evan T. Miyazono	<b>Project Number</b>  22563
<b>Project Title</b> A Possible Cure for Some Types of Color Vision Difficiencies	
<b>Objectives/Goals</b> The objective was to discover if filters and other optics could be used to improve color vision for people with protanomaly, red color deficiency, or deuteranomaly, green color deficiency? <b>Abstract</b> <b>Methods/Materials</b> A color deficiency test was assembled which included 24 images. Subjects A-F were willingly given this test. Upon determining the type of color deficiency for each individual, the subject was tested with Apparatus 2 (Apparatus 1 for Subject B), using colored filters of increasing percent color coverage in order to observe the rate of vision improvement. Apparatus 1 was constructed from a box with three holes, a glass plate as beam splitter, a mirror, a colored filter, a manila folder and tape. This apparatus superimposed a direct image with a reflected, filtered image. Apparatus 2 was constructed from a board with a rotating motor, on-off switch, battery, and four partially colored disks that acted as a partial filters. <b>Results</b> Apparatus 1 was unsuccessful due to apparatus imperfections. Apparatus 2, used with Subjects A,C,D,E, and F, was successful in improving each subject's color vision by the enhancement of red or green light through the filtering of other colors. Subject A improved by correctly reading first 5/24, then 8/24 images read correctly. Subject C, from 5/24 to 24/24 Subject D, from 6/24 to 23/24 Subject E, from 5/24 to 18/24 Subject F, from 4/24 to 20/24 <b>Conclusions/Discussion</b> The results show that the vision of people with protanomaly and deuteranomaly can be improved or completely corrected by using filters to add a specific amount, and color of light to the subject's normal view. The next step in this experiment would be to manufacture lenses constructed for each individual, and to test those lenses. The subjects who experienced the most improvements in this experiment were enthusiastic about the possibility of trying this type of experimental lens.	
<b>Summary Statement</b> My experiment is about finding a cure for color deficiencies by adding together filtered and unfiltered light in specific proportions.	
<b>Help Received</b> Science teacher supplied optics equipment; Mother helped type report; Father assisted in finding subjects.	