



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Christopher K. Mayer</b>  | <b>Project Number</b><br><b>J1016</b> |
| <b>Project Title</b><br><b>Do Differences in Visual Acuity Affect Peripheral Vision?</b>   |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>The objective of my project was to determine if differences in visual acuity affect peripheral vision. I propose that the subjects with myopia and hyperopia will have impaired peripheral vision compared to the subjects with 20/20 vision.</p> <p><b>Methods/Materials</b><br/>I tested the peripheral vision of subjects with myopia, hyperopia, and 20/20 vision. The subject population consists of 10 subjects of each visual acuity type. Using a handheld "Peripheral Vision Protractor" subjects were directed to stare at a focal object. The examiner then moves a color tab imprinted with either a circle or triangle from 0-90 degrees along the protractor and measurements were noted on when the subject initially perceives the color tab and when the imprinted shape was visualized. This procedure is repeated for all 3 colors and 2 shapes on both the right and left eye. The 3 colors I used were green, blue and red.</p> <p><b>Results</b><br/>The total average color recognition observed in 20/20 vision subjects was 18.3 degrees compared to 23.4 degrees for myopia subjects and 28.8 degrees for hyperopia subjects. The total average shape recognition observed in 20/20 vision subjects was 23.7 degrees compared to 29.6 degrees for myopia subjects and 34.8 degrees for hyperopia subjects.</p> <p><b>Conclusions/Discussion</b><br/>The results are consistent with my hypothesis and supported by my research that subjects with 20/20 vision have better peripheral vision when compared to subjects with myopia and hyperopia due to their eye's structural defects. In fact, hyperopia subjects proved to have the worst peripheral vision out of all subjects. The potential benefits of my research was to gain a better understanding of how we use peripheral vision in our daily lives. Also to potentially learn if different colors and shapes are more readily visualized, peripherally, leading to possible safety enhancement in our daily lives, i.e. sports, driving, etc.</p> |                                       |
| <b>Summary Statement</b><br>In this project, I will show that there is a corresponding loss of peripheral vision in people who have suffered a loss of visual acuity.  |                                       |
| <b>Help Received</b><br>I would like to thank my parents for acquiring my supplies for me. I would also like to thank the subjects who so willingly participated in experimentation.   |                                       |