



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

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| Name(s) Taylor S. Pulbrook | Project Number J0332 |
| Project Title Red Light, Green Light: Does the Color of Light Impact Reaction Times? | |
| Abstract Objectives/Goals I have noticed that red lights are used as signals to stop immediately. You see red lights on fire engines, police cars and other emergency vehicles as they signal people of their approach. The brake lights on cars light up red in color when vehicles are coming to a stop. My goal was to determine if the color of a light impacts a persons reaction time. If so which color provides the quickest time. Methods/Materials I developed a light box with 4 colored lights (red, green, blue and yellow)which was setup 2 meters in front of the subject. Recruited 30 people between the ages of 11-13 as subjects. The tester would randomly select a colored light and press a button which would illuminate the light and start a stopwatch. The test subject would react as fast as possible to push a stop button located 9 centimeters from their hand. When the button was pushed the stopwatch would show reaction time and the tester recorded the time on a log. Each subject was randomly tested to get 5 data points for each of the 4 colors. Results Green light yielded the best reaction times with an average time of .419 seconds, followed by yellow at .421 seconds, then red at .441 seconds and finally blue with the worst average reaction time of .447 seconds. Conclusions/Discussion Does light color effect reaction times? Yes. I did this experiment to determine which color would be the best to use when trying to signal for an immediate stop. The faster the reaction time to a color (such as tail lights on cars or emergency lights on equipment) the more lives that could be saved or accidents avoided. I had to reject my hypothesis that red would have the fastest reaction time. I based this on the idea that people are accustomed to seeing red lights for emergencies. Upon further analyses and research green overall did the best in terms of time. The best average reaction stop times were in this order (measured down to thousandths of a second): green - 0.419, yellow - 0.421, red - 0.441, and blue - 0.447. | |
| Summary Statement I wanted to find out the impact of light color as it pertains to a persons reaction time. | |
| Help Received Mr. Fonseca for building my light box. Mr. Post (my teacher) for letting me use his room. Dr. Martinez for her time and information on the eye. I appreciate the 30 people that volunteered to be test subjects. And lastly my Mom and Dad for helping me to clarify my project. | |