



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Daniel Lee	Project Number J1120
Project Title The Difference Between Standard Sealed Beam Headlights and Halogen Headlights	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective was to determine which headlight, the standard sealed beam headlight or the halogen headlight, would enable the driver of an automobile to see further distances. I hypothesized that the halogen headlight would enable the driver to see 100% further in length than the standard sealed beam headlight.</p> <p>Methods/Materials Two cars, a Nissan Maxima with a pair of standard sealed beam headlights installed and a Toyota Sequoia with a pair of halogen headlights installed, were parked adjacent to each other. The standard sealed beam headlights on the Nissan Maxima were turned on to the low-beam power. The assistant then took a large sheet of colored paper and stood approximately 150 meters away from the two cars (facing the cars' headlights). The assistant slowly moved towards the Nissan Maxima until the observer in the car could clearly see the color on the paper. I then measured how far the assistant (holding the paper) was from the headlight in meters and recorded it for later examination. This test was done with 8 different colors which included red, orange, yellow, green, blue, purple, black, and white. Each color was tested 3 times for both headlights. However, I did not think that the data collected was a sufficient amount for a valid conclusion so I did the experiment once more this time with 5 tests run for each color.</p> <p>Results The halogen headlight consistently dominated over the standard sealed beam headlight in every trial that was run except for 2 trials during the first experiment. The color was purple and it had an overall 4% increase compared to the length of the halogen headlight. The red color could be seen the farthest, and then came orange, white, yellow, green, blue, purple, and black.</p> <p>Conclusions/Discussion I conclude that the halogen headlight is the better headlight because it gives the driver an extra 18-25 meters of vision at night which will give them enough time to avoid an emergency. Although the halogen headlight was the dominant one, it never had a 100% increase from the standard sealed beam headlight. My hypothesis was partially correct in that the halogen headlight did perform better, but not as well as I thought it would.</p>	
Summary Statement Determining which headlight, the standard sealed beam headlight or the halogen headlight, will give the driver of an automobile more reaction time to avoid an emergency situation.	
Help Received Father was assistant for experiments; Mother was observer for experiments.	