



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> Colin S. Mansour	<b>Project Number</b> <b>J1814</b>
<b>Project Title</b> <b>Measuring Lasers: At the Speed of Light</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of my science fair experiment was to find how much a laser light was slowed when moving through different densities of material. My hypothesis was that the laser light will travel half the speed when the light shined through the double density gelatin compared to when the light shined through the single density gelatin.</p> <p><b>Methods/Materials</b> The constants and controls of my experiment were the angles at which the gelatin was positioned, angle of incidence, the type of laser used and the speed of light in air, vacuum. The variable in my experiment was the ratio of the gelatin mix to water. The single mix gelatin was a one to one ratio and the double mix gelatin was a two to one ratio of gelatin to water. The type of laser we used was a strait red laser level 30. The type of gelatin we used was Knox unflavored gelatin. To measure the responding variable, I measured and recorded the angle at which the light refracted. Snell's law equation was used to calculate the speed of light through the gelatin based on the measured angle of refraction.</p> <p><b>Results</b> The results of my experiment were that the gelatin slowed the laser that went through the double mix more than the single mix. The laser light traveled 127,590 miles per second through the single gelatin mix and the laser light traveled 120,182 miles per second through the double gelatin mix. This shows a 6.2% slowing of the speed as a comparison from the single mix to the double mix.</p> <p><b>Conclusions/Discussion</b> My project was about seeing if the different density of gelatin affected the speed of the laser. In my project using twice the gelatin mix only slowed the laser by 6.2 percent. This was hardly the 50 percent slowing I predicted in my hypothesis. This was significant because the single gelatin that I shot the laser through is a similar density to saline water, and the double gelatin mix was similar to the density of the inside of the eye. Understanding how lasers are affected by different densities may help doctors progress in the field of laser surgery.</p>	
<b>Summary Statement</b> My project was about seeing if the different density of gelatin affected the speed of the laser.	
<b>Help Received</b> Mother helped assemble board and binder; Dad helped with math equations.	