



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Jason E. Ma</b>	<b>Project Number</b> <b>J1524</b>
<b>Project Title</b> <b>Light Reflection and Refraction off Liquids</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of the project is to determine what properties of mediums affect the light reflection, refraction and intensity off different liquids and in what quantity. Another goal is to learn and understand the concept of light physics.</p> <p><b>Methods/Materials</b> The experimentation process of the testing was divided into two sections, light reflection and refraction. The two tests were both conducted in a controlled environment where the experimenter could work efficiently. Reflection testing was done with a setup of a tripod with the laser light, a table with the container of liquid and a wall with a measuring poster. The Refraction testing was done with the same setup except the measuring poster was underneath the container. This was the ideal setup since it is easier to conduct and to figure out the trigonometric functions needed in the experiment. The light was shined at a controlled 45 degree angle for both tests onto the setup and then were tested with different liquids. The liquids were all common substances that would be found in many households. The light source that was used was a laser pointer that had a 630-680nm wavelength and the light meter that was used was a normal flash/light meter.</p> <p><b>Results</b> The results of the experimentation came in two parts, one was the actual reflection and refraction of the light and the other was the properties that affected it. The light reflection testing results were constant because all of the liquids reflected the light at 45 degrees. The results for light refraction were different and were affected mainly by the viscosity property. Some of the results really puzzled the experimenter and made him dwell on what occurred for quite some time.</p> <p><b>Conclusions/Discussion</b> The properties color, opacity, and viscosity affected light reflection, refraction, and intensity by increasing or decreasing the angle of refraction and the intensity. The patterns in this experiment were that the reflection testing was constant and the properties had very little affect on it. Also in the refraction testing there were two main groups of results; watery liquids which averaged 1.7cm of refraction and oily liquids with an average of 2.2cm of refraction. The results prove the part correct hypothesis that the experimenter proposed in the beginning. Properties of different mediums do have an affect on light reflection and refraction.</p>	
<b>Summary Statement</b> Determining what properties affect light reflection, refraction and intensity off of different liquids.	
<b>Help Received</b> Teacher helped with experimental problems and Dad helped explain math and helped out during testing	