



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Kiera L. Fuller</b>	<b>Project Number</b> <b>J1509</b>
<b>Project Title</b> <b>Double-Slit Interference Patterns</b>	
<b>Abstract</b> <b>Objectives/Goals</b> This project was conducted to find out whether the distance between double-slits in a slide would affect the resulting interference fringes the same way with a piece of glass placed in front of one slit. The hypothesis was that, with the glass and without, the smaller the distance between the slits, the more spread out the fringes would be. <b>Methods/Materials</b> The setup of the experiment was a version of Young's double-slit experiment in which a laser was shined through ten different slit spacings ranging up to 1 mm in width. The slits were made in a glass slide that was sprayed with black spray paint. This arrangement was then directed at a wall where the distance between the resulting interference fringes could be easily recorded. The ten slits were each tested once with glass in front of one slit and once without for a total of twenty trials. <b>Results</b> The results gathered from the experiment showed that, for each slit spacing, with and without glass, the fringes became more spread out as the spacings were decreased. <b>Conclusions/Discussion</b> The results strongly supported the hypothesis. The only significant change the glass caused was that the laser light refracted and the entire pattern shifted over, but the correlation remained the same as did the interference pattern. This was because the actual interference that caused the resulting patterns was not changed, it was only directed differently. This data also shows that light is not only a particle, but also has wave properties causing it to diffract, refract, and interfere.	
<b>Summary Statement</b> This project was conducted to observe the effects different levels of diffraction and refraction would have on the interference patterns in a double-slit interference experiment.	
<b>Help Received</b> Mother bought supplies; Brother took pictures; Dad held setup in place; Sister recommended paint type	