



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> <b>Briana C. Howard</b>	<b>Project Number</b> <b>J0711</b>
<b>Project Title</b> <b>Somewhere Under the Rainbow! The Effects of Angle, Elevation, and Type of Light on the Efficiency of Solar Power Cells</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My project was to determine if the angle, elevation, or type of light striking a solar panel would affect the output of the panel. <b>Methods/Materials</b> I used a solar panel from a K-NEX kit and a digital volt meter. I designed a stand for the panel and a ferris wheel to measure RPM. To measure angles in 15 degree segments I used wood to build an apparatus with an adjustable dial. Lighting gels and a lamp were used for different types of light. Multiple readings were taken and averaged for variables of angle, elevation, and light. Sunlight readings were taken at midday between 11AM and 2PM. <b>Results</b> My data showed the optimum angle for a solar panel is 90 degrees, with the best range between 45 and 135 degrees. Sunlight performed better than any colored or artificial light. Elevation increased output, but with a narrower range of performance. Readings at 1000' in the San Fernando Valley were lower than sea level, possibly because of pollution. In comparison of volts to RPM, RPM remained fairly constant until volts dropped below motor requirements. <b>Conclusions/Discussion</b> My hypothesis was correct. Angle, elevation, and type of light do affect the efficiency of solar panels. The results show the importance of location and proper installation of solar panels. Also, the effect of pollution on some results shows the effect a clean atmosphere has on the purity of sunlight and solar energy.	
<b>Summary Statement</b> My project is about achieving the highest efficiency from solar power and the importance a non-polluted atmosphere has on solar energy.	
<b>Help Received</b> My mom helped with typing and cutting for the display. My dad supervised the building with power tools and did the driving. He also advised on making computer charts and graphs.	