



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> <b>Tohma A. Judge</b>	<b>Project Number</b> <b>J0818</b>
<b>Project Title</b> <b>Solar Cells: Can They Take the Heat?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective was to find how solar cell energy output was affected by temperature. I believed that all solar cells would produce less energy as the temperature went up and that the amorphous solar cell would be affected the least by the rise in temperature.</p> <p><b>Methods/Materials</b> A wooden box was constructed. A solar cell was placed inside and hooked to a voltmeter and a thermometer, both of which were outside the box. A blow-dryer was placed into a hole in the wall to provide hot air. A halogen lamp was placed on the top of the lid as a source of heat. At the start of the experiment, all equipment was turned on, and as the heat rose from about 10°C to 70°C, photos were taken of the thermometer and the voltmeter. The numeric data was later recorded onto charts. This process was repeated six times for a monocrystalline solar cell, a polycrystalline solar cell, and an amorphous solar cell.</p> <p><b>Results</b> I found that for all types of solar cells, the volts put out decreased as the temperature went up. I also found that the amorphous solar cell lost the least percentage of energy and that the monocrystalline solar cell lost the most percentage of energy, with the polycrystalline solar cell in between.</p> <p><b>Conclusions/Discussion</b> The results support my hypothesis. My conclusion is that the hotter a solar cell is, the less energy it will put out, and that amorphous cells are the least affected by temperature changes.</p>	
<b>Summary Statement</b> My project is about how solar cell energy output is affected by changes in temperature.	
<b>Help Received</b> My dad helped to construct the box and proofread the reports. I received information and tips from Mr. Robert Seton of DC Sonoma, a solar energy company, and Mr. Kelly Murray, who works with solar cells for Lockheed-Martin.	