



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Macallan Brown; Elias Dykaar</b>	<b>Project Number</b> <b>J1006</b>
<b>Project Title</b> <b>Smoked Out Power</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Determine how smoke from a forest fire affects the power output of solar cells and if either amorphous or crystalline solar cells perform better in a smoky environment.</p> <p><b>Methods/Materials</b> The Plexiglas box (30 cm x 30 cm x 30 cm) is constructed and placed over the amorphous and crystalline solar cells. A 150 watt light bulb is mounted above box for the light source. Smoke is put into the box by burning a stick of incense inside the box. The output of the solar cells is measured before smoke is introduced and after every two cm of incense is burned. The output of the solar cells is determined by measuring the voltage drop across a 100 ohm resistor and a 220 ohm resistor. The power is calculated using the equation <math>P=V^2/R</math> where P=power, V=voltage, and R=resistance.</p> <p><b>Results</b> We found that smoke decreases the power output of both types of solar cell 60 to 70 percent. The amorphous solar cell transformed 25 percent more power than the crystalline solar cell at 10 cm of incense burned.</p> <p><b>Conclusions/Discussion</b> Our data shows that smoke from forest fires will significantly affect the power output of solar cells. Amorphous solar cells will work better in a smoky atmosphere than crystalline solar cells. Since the climate is steadily growing warmer and dryer, forest fires are becoming more frequent as evidenced by the numerous forest fires in California during the summer of 2008. Solar cells are a great way to obtain renewable energy however forest fires will substantially reduce their power output.</p>	
<b>Summary Statement</b> To measure the affect of smoke on the power output of solar cells.	
<b>Help Received</b> Dad helped build box, and monitored the report process, Mom helped edit report, Mr. Steely gave instructions	