



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) John E. Carrion	Project Number 29311
Project Title Solar Panels with Reflectors	
Abstract Objectives/Goals The purpose of my science project is to determine if light reflected onto a solar panel is an efficient way to produce electricity. Last year I tested at which angle to the light source does a solar panel create the most voltage. That project made me wonder what would happen if I put two solar panels back to back, one in direct light and one getting light from a reflective surface? That is this year's project. Methods/Materials 2 Solar panels, a 1000 watt spot light, black foam board (control background), white cardboard (white reflector), 2 mirrors, a voltmeter. I compared two different reflective surfaces shining light onto a solar panel and measured the voltage output of a solar panel. I also measured the voltage output of another solar panel in direct light. I tested the panels with the light source at 90 degrees to the face of the solar panels, then moved in 10 degree increments, all the way down to 0 degrees. Results Overall, white reflectors worked better than mirrors at all angles except from 70 degrees down to 50 degrees. The white reflectors consistently and more evenly produced light at most angles. The mirrors were the best at 70 degrees (almost producing the same amount of light as the solar panel in direct light), but dropped off at all other angles, due to the law of specular reflection. Conclusions/Discussion White Reflectors are the reflectors that produced light, and therefore electricity the most consistently. As reflectors, the mirrors are actually better than the white reflectors, but only when the sun is at a specific place in the sky. If you can somehow get the mirrors to track the movement of the sun, the mirrors would be the best reflector.	
Summary Statement Which reflective surface, white cardboard or mirrors, will most efficiently produce more electricity on a solar panel?	
Help Received My Mom proof read docs, my Dad helped build the display board and was a second set of hands when needed.	