



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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Project Title Reflections on Reflection	
Abstract Objectives/Goals The purpose of this year's science project, Reflections on Reflection, was to attempt to develop a cost effective method of concentrating light onto a photovoltaic solar panel. Specifically, we tested which reflective materials work well and by how much it improves efficiency. As a result of the low accuracy of the hyperbolic and smaller parabolic reflector, only the large parabolic reflector was used. Our tests include one thirty minute and five ten minute trials with and without using the large parabolic reflector. Methods/Materials The procedure included constructing a Cassegrain reflector using mirror tape and window mirror film, and allowing a photovoltaic solar panel to charge three AA Ni-MH batteries for sets of 10 and 30 minutes with and without the use of the reflector. After the charging period, the cumulative voltage of the batteries was tested and were connected to six LED lights; this duration was recorded. Five sets of ten minutes and one set of thirty minutes were conducted. Results The data supported the idea that such a device can enhance the power of a photovoltaic cell. In the ten minute period, the batteries charged with the reflector lit the LEDs for 46 minutes, while the batteries charged without the reflector lit the LEDs for an average of 15 minutes. This shows that using the reflector tripled the charge stored in the batteries under a given time. Ultimately, voltage did not serve well as a means of measuring how much more energy was absorbed. Conclusions/Discussion This experiment produced applicable information that may possibly influence the solar panel industry by providing less expensive CPV solar units. Finding ways to produce an affordable means of manifesting solar light is the major struggle the solar companies face; by continuing and expanding upon experiments like this the use of solar energy will help to win the fight for energy independence.	
Summary Statement Reflections on Reflections is an exploration of concentrate photovolatics, by constructing a modified Cassegrain reflector.	
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