



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Landon R. Creighton</b>	<b>Project Number</b> <b>J0202</b>
<b>Project Title</b> <b>Engineering a New Way of Generating Electricity Using a Fresnel Lens and a High Temperature Collector</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> There is a constant need for producing energy. The U.S. is the second most energy consuming country in the world (313 BTU per capita). There is a huge need for new ways of producing energy. I am using the unending supply of energy the sun produces. My idea could be advanced and upgraded to commercial level if properly designed and tested. It could also prove quite useful in places where they have no massive energy producers and where wind turbines may not work or photovoltaic cells are too expensive. Design Criteria. It has to be safe. It must use only the sun to power the collector. It must be dependable and reusable. It must be fairly easy to make. It must be ecology friendly.</p> <p><b>Methods/Materials</b> I tried six different prototypes before I came to my working prototype. My prototypes used a variety of different materials but they always used a Fresnel lens to power them. My prototypes are considered high temperature collectors because they collect the sun's rays and transfer them to water making it turn to steam. As the water turns to steam it expands taking up to 1700 times in volume. As the boiler tank builds pressure it is released onto a generator fan, which produces energy.</p> <p><b>Results</b> Prototype 1 did not work, due to a faulty design. Its major flaw was failing to make the water turn to steam fast enough or at least to a significant degree. Prototype 2 did not build pressure probably because once I sent it into the pressure tank it cooled and turned back into water. Prototype 3 did not build enough pressure to turn a generator fan. It did produce a lot of steam but it did not build pressure. Prototype 4 failed to consistently produce electricity. Prototype 5 failed by breaking the mirror after the heat became intense. I learned from this prototype that I should have a flat space on the next prototype so I will be able to focus on the target and hopefully produce more heat. Prototype 6 was successful in all areas of my criteria. The pressure in the boiler chamber got to twenty pounds and was able to turn the generator fan for a prolonged amount of time.</p> <p><b>Conclusions/Discussion</b> Prototype 6 was successful. It produced energy with efficiency and consistently turned the generator fan blade. It was ecology friendly and safe. It fit all my criteria perfectly except for being easy to build because it did take a large amount of welding. Prototype 6 took a large amount of time to build pressure it was successful.</p>	
<b>Summary Statement</b> This project proves that I can engineer a working high temperature collector powered by a Fresnel lens.	
<b>Help Received</b> My mom helped me find resources and proofread my work. My Dad helped me build the prototypes and did the welding. Brothers and sister gave advice.	