CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)	Project Number
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Project Title

Solar Energy: Increasing Power with Helio-Trackers and Fresnel Lenses

Abstract

Objectives/Goals
My goal was to determine whether or not you can increase the power generated by a solar panel by using concentrated lenses and tracking the sun with a helio-tracker (Sun-tracker).

Methods/Materials
The main things used in the experiment were solar panels, a Fresnel lens, lights and motors. I used Lego Mindstorms motors to move the lights in an arc to simulate the sun. I then used a multimeter to measure the voltage of the panel with the Fresnel lens, the helio-tracker, and the standard mounted panel at different points during the day. The panels were then wired to small DC motors that powered a custom gearbox, that pulled three small cars up a ramp. The distance that the cars traveled was proportional to the amount of power generated by the solar panel.

Results
The results from my tests showed that over the course of a day, the helio-tracker is around 20 percent more efficient than both the ordinary panel, and the panel with the Fresnel lens. The result reveals that you can increase the power of a solar panel when it tracks the sun.

Conclusions/Discussion
The results support my hypothesis because I predicted that the helio tracker would generate more power, and it ended up doing so. This expands the category of renewable energy engineering because is helpful to building more efficient solar panels and better ways to capture energy. This is very important because the more renewable energy we have the less reliant on fossil fuels we are. Plus, in the long run you end up saving money because you have 20 percent more energy than if you had a regular panel.

Summary Statement

My project was about determining if you can increase the power generated by a solar panel using helio-trackers and Fresnel lenses.

Help Received

I designed, built, and conducted the experiments myself with the exception of the skillsaw work conducted by my dad in building the project platform.