CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)
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Project Number
S0309

Project Title
Maximizing the Efficiency of a Parabolic Solar Water Heater

Abstract

Objectives/Goals
A solar water heater is designed that uses the properties of a parabola to heat water and maximize the efficiency of this transfer through flow rate. If the flow rate of the system was decreased the overall temperature of the system would increase at a faster rate.

Methods/Materials
A structure is created that includes a 4' x 8' mirrored acrylic sheet that is shaped into a parabolic frame. A copper pipe is positioned through the focal point of the parabola and water is cycled through in a closed system.

Results
Each flow rate is tested by filling the system with 5 gallons of water and then letting the system run for 35 minutes, recording the temperature of the system at 5 minute intervals. The slowest flow rate was most effective and heated the water to 112 degrees fahrenheit after 35 minutes.

Conclusions/Discussion
This proves the hypothesis is correct as the slowest flow rate was the most efficient in heating the water.

Summary Statement
This project is designed to create a parabolic solar water heater and maximize the efficiency of this device.

Help Received
Dad helped with construction and plumbing.