CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

35790

Project Title

The Effect of a Fresnel Lens upon Solar Still Productivity

Abstract

Objectives/Goals

This experiment is intended to determine how a Fresnel (magnifying) lens affects the water output of a solar still. The outcome of this research could possibly provide insight to help increase the productivity of solar stills.

Methods/Materials

Two hundred grams of distilled water were placed in a solar still with a standard glass window and 200 grams distilled water were simultaneously placed in a solar still with a Fresnel lens, each beneath its own five hundred watt light fixture, then the output of each still was measured and compared.

Results

The still using the Fresnel lens produced a greater amount of water than the control still. On average the test still produced 47.1 grams of water, compared to the 32.6 grams produced by the control still during 120 minute trials. The data show a statistically significant 44% increase in water production when a Fresnel lens was used to concentrate the light. The control still maintained a consistent level of water production throughout the
trials.

Conclusions/Discussion

The Fresnel lens captured light energy and concentrated it into one focal point in the tray of water below, efficiently evaporating and condensing more water than the control still. A solar still using a Fresnel lens could potentially collect 44% more water than a typical still, a notable increase in water production. Future research and trials need to be conducted under natural sunlight.

Summary Statement

The use of a Fresnel lens on a solar still resulted in a 44% increase in water production.

Help Received

Father helped construct solar stills and helped perform T-test analysis in Excel

Preliminary