Name(s)	Project Number
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Project Title

Interdisciplinary Approach to Deforestation and Lung Disease: Using Photovoltaic Systems to Build Low-Cost Solar Cookers

Abstract

Objectives
Design an affordable immersion heater that can alleviate the high numbers of indoor air pollution in the global developing population. The heater must cost lest than $2 in raw materials, and feed a small family of four.

Methods
This project is a novel approach to create a sustainable immersion heater, consisting of an outer metal tube, a thermally conductive and electrically insulative composite, and a diode chain. Created immersion heaters using recycled aluminum soda cans and diodes chains with bimetallic temperature switches. Connected the cookers to a DC power supply to mimic the effects of a power source.

Results
The final design was an oil-based heater made out of recycled aluminum soda cans that costs $1.48 to build. Further testing would be to attempt to cook dry goods, as immersion heaters can only be used on wet goods.

Conclusions
Globally, more than 1.3 million people die prematurely each year because of exposure to indoor air pollution due to the burning of biomass. By implementing low cost approaches to solar cooking and eliminating the need for fires, the rates of deforestation and consequently respiratory disease will decrease. This project was a regional finalist in the Junior Humanities and Science Symposium. It is also on its way to be published in the Journal for Emerging Female Scientists.

Summary Statement

I developed an immersion heater that costs less than $2 to build in order to decrease the levels of indoor air pollution in the global developing population.

Help Received

I designed and built the immersion heater myself. I was allowed access to DC power supplies from my high school, and my AP Biology teacher helped me with statistical analysis.