

CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

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Project Title

Just Charge It: Thermoelectric Generator Gear for the Active Person (Charge Small Electronics Using Your Own Body Heat)

Abstract

Objectives/Goals

ge small electronic The objective of our project is to create a thermoelectric generator vest which of devices such as a cell phone based on the Seebeck Effect.

Methods/Materials

11 Peltier Tiles

11 Heat Sinks

Insulated wire

Transistor

1K Ohms Resister

Toroid

LEDs

Window Screen

Old Shirt for vest

Infrared laser Thermometer

Cell Phone & Charger Cable

Multi Meter

Results

Our goal was to generate 4 volts with our TEG with as little as a 30 degree temperature difference between body heat and ambient temperature. At first our TEG only produced .7 volts so we looked into making it more efficient and came across a simple devise called the Joule Thief, which is a voltage booster. We built our own Joule Thief and added it to our TEG. We were able to then generator enough electricity to light up a 2 volt LED.

Conclusions/Discussion

Our experiment proved to be correct. By using Peltier tiles, we were able to create a thermoelectric generator based on the Seebeck effect. Wower able to charge our cell phone, light up our display board and run a clock all at the same time with our TEG but only when we created a large artificial temperature difference by using a hot plate and room temperature. However, by adding 1 homemade Joule Thief to our TEG, we were able to generate 3 times the voltage thus generating 2 volts with just using simulated body heat. With this major break through, we believe that by adding a Joule Thief to each Peltier circuit on the TEG we should be able to generate enough volts to charge our smart phone.

Summary Statement

Based of the Seebeck Effect, we built a thermoelectric vest that produces electricity powered by body heat to generate enough volts to charge a small electronic device.

Help Received

My Mother, Christine Prata, helped sew the window screen to the shirt. She also helped us solder wires together and for safety she observed us during our experiments.