



## Colorado Science and Engineering Fair

## 2024 Individual Project Abstract Form

**Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.**

Title of Project: The Perfect Pan II

Finalist's Name: Teagan Archer

School and City: Mancos High School, Mancos CO

Sponsor's Name: Brady Archer

Category: Engineering (ENGR)

Division: Senior (9th - 12th grades)

Abstract (250 words or less):

In 2021 I set out to make a backpacking pot that was multi use, and could harvest energy through heat differential, while still being lightweight. In doing this I discovered a product, called a peltier that could produce voltage by using the temperature difference between boiling water and the outside temperature. Unfortunately the difference was not extreme enough to get the amount of voltage needed to power something. However the rest of the pot was a success, and met all of the engineering goals set. So this year, I redesigned the peltier portion of the pot. The main goal was to create renewable energy through these peltiers. So I not only added 5 more of them, but also made it so the hot side was getting hotter and the cold side was staying colder. I did this by using a mix of insulation and cold water radiators to aid in this process. For this project my specific engineering goal were to get 3-5 volts of electricity through the peltiers, boil water with the heat coil, use both solar power and peltier power to run things, and have a sturdy and cohesive pot. I met the majority of these goals, and am continuing to work on getting the peltier to a higher voltage, and also experimenting with using the voltage to light a small bulb.

*I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.*

Finalist's Signature:

Date: 2/29/24

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. A signed copy of this form must be included in your notebook.