



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Everett "Rett" Frost	Project Number J0812
Project Title Turning Up the Heat: Optimizing a Portable, Low Cost Solar Oven Design	
Objectives/Goals The objective is to explore the most cost effective, portable, box style solar oven that could be used in underdeveloped countries to pasteurize water or sterilize food. My hypothesis was the 36 in cube oven, covered oven with mirror walls and a tall stand would be the most effective oven.	
Abstract Methods/Materials I tested three sizes of ovens, two reflective materials, covered and uncovered ovens and two different stand heights. I build the oven and placed a 15 gram water sample in the oven. I measured the temperature of the water sample every 15 minutes during the 90 minute testing period. I tested the ovens side-by-side so that I could eliminate some of the independent variables like angle of sun, wind, quality of sun, etc.	
Results The mirror material out performed the aluminum material. The 18 in cube oven out performed the large ovens. The covered ovens out performed the uncovered and the lower stand height was only slightly better. After adjusting for the cost of the reflecting material, the aluminum foil was the superior performer.	
Conclusions/Discussion Results did not support the hypothesis. The best performer was the 18 in cube, covered oven. This portable, low cost oven could offer underdeveloped countries a realistic solution to cooking food, or pasteurizing water.	
Summary Statement Optimizing a Portable, Low Cost Solar Oven Design	
Help Received Chase Brutton, a friend helped me take numerous temperature readings. I borrowed a light meter and digital camera.	