



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.) Spencer J. Warren	Science Fair Use Only
Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) Fuel and Heat Values of Woods	J1422
	Division <input checked="" type="checkbox"/> Junior (6-8) <input type="checkbox"/> Senior (9-12)
Preferred Category (See page 5 for descriptions.) 10 - Materials Science	
Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges. <p>Objective: The main objective of my project was to determine the relative fuel and heat values of wood samples. Another objective was to prove my hypothesis that Oak (a hardwood) would have a higher heat value than Pine, but Pine (a conifer) would have a higher fuel value. I also hypothesized that woods with the highest densities would, in general, have the highest heat values.</p> <p>Materials: Some basic materials used in my project were wood samples, a thermometer, a mass scale, a water-filled flask, alcohol, a bench plane, a ring stand, and burn pans. I constructed a calorimeter with the flask, thermometer, and burn pan, and burned sample wood shavings in a controlled environment. Using data taken from the burns, including water temperature rise, water volume, and wood masses and volumes, I was able to calculate fuel and heat values.</p> <p>Results: Mahogany and Teak had the highest fuel and heat values; Oak had a higher heat value than Pine, but Pine had a higher fuel value than Oak.</p> <p>Conclusion: My results supported my hypotheses and I was able to obtain my objectives. Knowing about relative fuel and heat values of different woods, we can select which wood might best be stored for use in a fireplace or wood-burning heater.</p>	
Summary Statement (In one sentence, state what your project is about.) My project was about determining the relative heat outputs of wood samples by both volume (heat value) and by mass (fuel value.)	
Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Mother and Father helped gather materials; Father supervised my burning of the samples and helped me graph my results.	