CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
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Project Number
J1106

Project Title
How Does the Species of Wood Used in a Fire Affect the Resultant Temperature Produced?

Abstract

Objectives/Goals
The objective is to determine which wood would serve as the best firewood for home heating. Five different woods were burned in order to test which of the five would produce the greatest temperature.

Methods/Materials
Five different woods (Black Walnut, Pine, Douglas Fir, Oak and Redwood) were ignited from underneath a metal screen with a butane lighter. Each burning five gram wood block was set to burn underneath a beaker of water for two minutes. The temperature was measured using a thermometer which hung into the beaker of water, just above the base. The temperature rise was then measured and averaged after the completion of five trials of each wood.

Results
After the completion of the experiment, the average temperature rises were calculated. The following results were recorded from least temperature to greatest temperature rise: Redwood, Oak, Douglas Fir, Pine and Black Walnut.

Conclusions/Discussion
My original hypothesis was that the "harder" a wood is, the higher the maximum possible temperature that it could produce is. My results and research from my Background Information contradict my hypothesis due to the fact that the maximum temperatures that woods can produce are independent of hardness and density. The experiment that I conducted provided proof of this, for the "harder" woods did not produce a corresponding list of maximum temperatures.

Summary Statement
With the goal of discovering the best firewood in mind, I tested which woods of five different species would produce the greatest maximum temperatures.

Help Received
Mother helped with procedure organization; Father helped cut wood into five gram blocks; Science teacher helped with organization/revision of the report; Bob Devoe, a retired professor and engineer, provided blocks of wood with a 0% moisture content for use in the experiment.