



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: Playing With Fire

Finalist's Name: Brooklynn Labonte

School and City: Cardinal Community Academy, Keenesburg

Sponsor's Name: Sarah Johnson

Category: Plant Sciences (PLNT)

Division: Junior (6th - 8th grades)

Abstract (250 words or less):

In my project I wanted to test what species of wood burns the longest and hottest depending on the density. My hypothesis was, "The more dense the wood is, the longer it will burn, and the less dense the wood is, the hotter it will burn," I made this prediction because I thought softwood wood would burn hotter since it didn't last as long as hardwood in fire. The procedure steps I followed to execute my experiment began with preparing the different woods by cutting the dimensions 0.5x4x6in. The wood that I will be using is (Pine, cedar, walnut, elm, and maple). After the pieces are ready, I'm going to measure the mass and volume of the piece to calculate the density. To measure the mass I will use a food scale. The formula that I will be using is $d = M/V$. When I find the density of the piece, I will record it and then use the Janka hardness scale to determine how hard each sample is. After I have all the information for my sample piece I will clean out my standard wood burning stove so that there is no ash visible. I will make a custom mesh wire rack so that a flame from the torch has contact on the wood in the same exact corner every time. Then I will place the rack in the clean stove, then light the torch, and place ethel wood sample on the rack. I will apply heat with the torch for 3 minutes so that the flame is hot enough to ignite the wood. To get an accurate time I will start the timer as soon as I put the wood on the rack so that the corner of the wood has the applied heat from the torch contact. Every 5 minutes I'll measure the heat from the flame 1 inch above the wood in the middle of the flame with a Infrared thermometer, and document the temps in celsius/fahrenheit. I will continue this process until the flame goes out. Then I will repeat this entire process with each of my samples. My results supplied me with knowledge that softwoods didn't burn as long, or as hot as hardwoods did. The average time the softwoods burned was 25 minutes, and the average time the hardwoods burnt was between 25-40 minutes. The hardwoods were more dense than the softwoods and I think that's why those burn longer. My hypothesis was half correct because I said "The more dense the wood is, the longer it will burn, and the less dense the wood is, the hotter it will burn", I right for the first part, but I was incorrect on the second part, because the softwoods that aren't dense did burn hotter than the hardwoods. If I were to do this experiment again, I would include more samples and trials. With these changes I could've been able to get a more accurate burning time so I could make sure the density is why the hardwoods burnt longer.

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:

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 o 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.