



CALIFORNIA STATE SCIENCE FAIR

2005 PROJECT SUMMARY

Name(s) Lauren E. Kelly	Project Number J1118
Project Title Does Density Affect a Wood's Combustion Rate?	
Objectives/Goals To discover if the density of a wood affects its combustion rate in a measurable way.	Abstract Six different species of wood were cut into samples of equal dimensions and, therefore, equal volume. Three samples were made for each species. The mass of each sample was recorded and its density calculated. Each sample was then placed on a hot plate and the time that it took the sample to reach combustion was recorded. The average of the three samples' combustion rate was calculated for each species of wood. The results were analyzed to determine if there was a connection between the density of a specific wood and the time it took for that wood to reach combustion.
Methods/Materials Materials: 1 hot plate, 1 stopwatch, 6 plastic cups, metric ruler, pen, triple beam balance, calculator, bowl of water, notebook, table saw, 18 wood samples	Methods: Methods: Six different species of wood were cut into samples of equal dimensions and, therefore, equal volume. Three samples were made for each species. The mass of each sample was recorded and its density calculated. Each sample was then placed on a hot plate and the time that it took the sample to reach combustion was recorded. The average of the three samples' combustion rate was calculated for each species of wood. The results were analyzed to determine if there was a connection between the density of a specific wood and the time it took for that wood to reach combustion.
Results The lowest in density of my six samples of wood was redwood with an average density of 0.314 gm/cm ³ . It was also the lowest in combustion rate with an average time of 2 minutes, 11 seconds before it ignited. The wood sample with highest density was maple with a density of 0.769 gm/cm ³ and maple also had the highest combustion rate with an average time of 3 minutes, 5 seconds before it ignited. My data shows that as the density of the wood gets bigger, the time it takes for the wood to ignite also increases.	
Conclusions/Discussion After completing my investigation testing the effects of density on a wood's combustion rate, I can conclude that density does affect a wood's combustion rate. My hypothesis states that density affects a wood's combustion rate by increasing its time and I believe that the cause of this is that the particles are tightly compacted, making it difficult for heat currents to go through the wood to create a flame. After comparing my results with my hypothesis I can conclude that my hypothesis is correct.	
Summary Statement This project is an investigation into the relationship between a wood's density and its combustion rate.	
Help Received Father helped supply and cut wood samples, mother helped format my typed pages.	