CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Laelia Z. Fitzgerald

Project Number
J1509

Project Title
Does Fire Retardant Work and Does Its Effectiveness Vary on Redwood, Pine, and Cedar?

Abstract

Objectives/Goals
The problem that the experiment was going to solve was "Does fire retardant work and does it#s effectiveness vary on redwood, pine, and cedar?"

Methods/Materials
For each of the woods, coated with fire retardant and not coated with fire retardant, 50 trials, 300 trials in total, were conducted to see what the average time until combustion was. Each piece of wood was burned on a campfire stove at medium heat. After the piece of wood could sustain combustion for at least 3 seconds after being taken off of the fire, the time until the wood sustained combustion was recorded.

Results
The average time until combustion for the uncoated redwood was 21 seconds, average of cedar was 18 seconds, and average of southern yellow pine was 16 seconds. So, out of the uncoated woods, the redwood burned slowest, cedar burned at a medium rate, and pine burned at the slowest rate.
The other 150 pieces of wood were coated with CeaseFire fire retardant, let dry, and burned. The average time of redwood was 328 seconds, the average combustion time of cedar was 307 seconds, and the average combustion time of pine was 306 seconds. Therefore, redwood had the highest combustion average, the cedar second highest combustion average, and pine the lowest combustion average.

Conclusions/Discussion
The conclusions that could be drawn from this experiment are that redwood is the least flammable of the three most commonly used woods for outdoor purposes. Fireproofing redwood exponentially increases the time until combustion, and if used for an outdoor structure, it could take over 15 minutes to catch fire, long enough perhaps for firemen to put out the impending fire. Fireproofed Cedar and fireproofed Pine are the next best choices, because though they take less time to combust than redwood, they also do take several minutes to combust. Of course, the use of wood for outdoor structures depends also on the mindset of the user. Redwood treated with fire retardant may be the best choice in terms of flammability, and it looks nice and and very good working qualities, it is also expensive and is not so good for the environment, as it takes decades for a single tree to grow. However, if there is going to be an outdoor structure in a fire-prone area, redwood, treated preferably, is the most appropriate wood to use.

Summary Statement
The purpose of my project was to find out if fire retardant worked, which commonly used wood for outdoor purposes it worked best on and to apply that to find out what wood would be most ideal in fire-prone areas.

Help Received
Father, Gerald Fitzgerald, assistance with set up and graphs; Brother, Michael Fitzgerald, assistance recording data; Grandfather, Randy Faulk, cutting wood.