# CALIFORNIA STATE SCIENCE FAIR
# 2014 PROJECT SUMMARY

**Name(s)**
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**Project Number**
34312

**Project Title**
## The Best Firewood

**Abstract**

**Objectives/Goals**
The purpose of my project was to find the best firewood in terms of most heat with the least smoke at a good price. It is important because more and more people in our community are using indoor and outdoor fireplaces and stoves that burn firewood. This leads to dangerous levels of air pollution which can cause many health and environmental problems. I tested the heat of firewood and the duration of the heat to analyze which wood burns best. I measured the height of the flame and the smoke level at different time periods to make sure the least amount of pollution is put in the air. I then correlated my findings to the prices of the firewood. Based on my results people can then change their choice of firewood and there will be less pollution.

**Methods/Materials**
I burned wood samples cut to size - 16" long x 3"wide x 3" high - with a moisture content lower than 20% of Cedar, Madrone, Oak, Fir, Eucalyptus, and leaf litter of the same volume as the wood. For each sample I measured the height of the flame, the heat of the fire, and the smoke opacity every two minutes for two hours or until the temperature reached 100 degrees Fahrenheit.

**Results**
My data show that the best woods to burn are Madrone and Oak because they produce the most heat with the least smoke at the best price.. The most comfortable height of the flame came from Madrone. The cost of the woods were very important because Fir and Cedar cost the same, but Cedar makes about twice as much heat and twice as much smoke. Another thing I found was that Fir, which is the most commonly bought wood, is not the best wood and has medium levels of smoke. The worst things to burn are leaf litter and Eucalyptus.

**Conclusions/Discussion**
I would advise for people who have wood burning fireplaces and stoves to use only 20% or less moisture wood, mostly Oak and Madrone. Take the wood out after the fire begins to smolder because after smoldering, the fire will produce more smoke. And also, just because Fir is thought to be cheaper and easier to burn, it is not. You can get triple the heat and half the smoke by paying 15% to 25% more money for Oak or Madrone.

**Summary Statement**
Which fire wood is the best in making the most heat for the longest time with the least smoke and the flame in a three feet range for the least price.

**Help Received**
Scotts Valley Fire Department provided Laser Thermometer; Opacity Chart provided by Monterey Bay Unified Air Pollution Control District; Mother helped record data during experiment and helped typing. Father helped set up the experiment and with mounting information on display board.