



# CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

<b>Name(s)</b> <b>Lucas G. Kurlan</b>	<b>Project Number</b> <b>J2123</b>
<b>Project Title</b> <b>Effectiveness of Fire Retardant Products on Pine and Redwood</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The goal of this project was to answer a lingering question in the minds of many fire-wary California homeowners: How can I better protect my home, and do fire-retardant wood coatings really live up to their claims of fire protection? I designed this experiment to test the effects of NoFire A-18 and Flame Stop II either alone or with a topcoat of a typical paint, sealant, stain, or varnish on white pine and redwood.</p> <p><b>Methods/Materials</b> The 80 tests were performed on 20 garden stakes (the samples) of redwood and white pinewood over, but not touching, a burner emitting a constant flame from a constant distance. The ignition test was the time from exposure to a flame to the time the sample caught on fire (there was very little variation from sample to sample). The burner remained on underneath the specimen for exactly 1 minute after the sample caught on fire, and the time to extinguish was recorded from the moment the burner turned off to the time the fire extinguished. During these tests, a suction fan ran on low to prevent an accumulation of smoke.</p> <p><b>Results</b> The results of this experiment showed that for white pine, adding NoFire A-18, an intumescent (expanding) fire-retardant paint, under a topcoat of typical paint or by itself, consistently reduced the time to extinguish (getting the lowest results consistently), on average decreasing the time to extinguish by 77 percent. Raw pine wood saw a 97 percent decrease in the time to extinguish when a flame-retardant coating was added. The addition of flame-retardant paint and flame retardant sealant together to pine specimens showed inconsistent results. With the redwood samples, the time to extinguish was consistently reduced by an average of 70 percent when Flame Stop II (fire-retardant sealant) was added. The raw redwood had a decrease of 78.14 percent to extinguish.</p> <p><b>Conclusions/Discussion</b> These results showed that the tested flame retardants work, consistently decreasing the time to extinguish. Unexpectedly, adding both retardants to a sample yielded inconsistent results. If one is willing to spend extra money on a tested flame-retardant coating, the most effective treatment would be a combination of Frazee enamel and NoFire A-18.</p>	
<b>Summary Statement</b> My experiment showed the effects of fire-retardant paint and sealant on white pine and redwood.	
<b>Help Received</b> Thanks to my father and mother for their supervision during the experiment and for purchasing supplies. Thanks to my brother for his taking of pictures. Thanks to my science teacher for her guidance and edits. Thanks to Mrs. Rucker for her help with the graphs and the board.	