



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

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| <b>Name(s)</b><br>Madina M. Ansari   | <b>Project Number</b><br><br>34685 |
| <b>Project Title</b><br>Which "Wood" You Believe Is the Most Fire Retardant?   |                                    |
| <b>Objectives/Goals</b><br>The goal of this project is to find the best wood type and fire-retardant solution combination. It was hypothesized that the painted, fire-retardant sprayed redwood would have the greatest performance.<br><b>Abstract</b><br><b>Methods/Materials</b><br>This project tests three different wood types: pine, cedar, and redwood, with four different solutions: borax, copper sulfate, borax and copper sulfate together, and a commercial fire-retardant spray. Also tested was whether adding paint to the solutions improved the wood's fire resistance. The procedures of these experiments included treating each wood type in the four different solutions (the first experiment, non-painted, and the second, painted). There were 3 samples each wood type and solution combination which was burned in one minute increments on high heat using an outdoor grill. The weights of the wood pieces were recorded before and after burning. The results were compared and graphed using Microsoft Excel.<br><b>Results</b><br>Based on my results, I was able to discover four conclusions: the best combination of wood type and solution, the best overall solution, the best overall wood type, and whether adding paint increases effectiveness. It was found that the best combination of wood type and solution was the non-painted borax solution with redwood which lost an average of 1% of its weight. Fire-retardant spray on non-painted wood proved to be the best isolated solution, losing an average of 2% of total weight. Redwood proved to be the best wood type, losing an average of 4% of its weight. Finally, it was found that adding paint to the solutions does not prevent a significant amount of weight loss.<br><b>Conclusions/Discussion</b><br>My hypothesis was both supported and disproved in this experiment. It was hypothesized that the painted redwood treated with the fire retardant spray would be the most fire resistant. Redwood was the best overall wood type, and the non-painted wood pieces treated with fire retardant spray was the best overall solution. The combination of the two, however, was not the most effective- this is where my hypothesis was disproved. The results of my experiment and also further research proved to be beneficial to lumber and construction companies, and consumers. When constructing buildings and homes, whether in fire prone areas or elsewhere, consumers will know the most fire resistant wood type and solution combination, the best overall solution, and the best overall wood type. |                                    |
| <b>Summary Statement</b><br>This project experiments with different wood types and solutions to find the combination that is most fire retardant.  |                                    |
| <b>Help Received</b><br>Mother purchased all the materials needed for this project and assisted me through experimentation; Science fair mentor guided me throughout experiments and in recording data.  |                                    |