



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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| Name(s) Seth G. McFarland | Project Number J1120 |
| Project Title Structural Protection in Wildfire Hazard Areas | |
| Abstract Objectives/Goals To determine which fire retarding treatment would best protect a structure from wildfires. Methods/Materials I constructed boxes to test the effectiveness of different fire retardants. I set a torch at three different temperature settings to simulate wildfire temperatures of 260°C, 540°C and 815°C. I put each box into the flame and measured the time it took the treatment to fail (catch fire). Results The untreated boxes failed much quicker than any of the other treatments. The treatment of water worked much better than no treatment at the lowest temperature with an average of 238 seconds for water, as compared to 29 seconds. At the higher temperatures, especially 815°C, the water evaporated off very quickly and failed after 32 seconds as compared to the untreated boxes which failed after 22 seconds. The treatment of foam was slightly more effective than water in all of the tests. Foam's time to failure decreased significantly at 815°C, but still did better than water taking an average of 23 seconds longer to fail. The sodium polyacrylate gel failed after a far longer amount of time than any of the other treatments. At 260°C gel took 695 seconds to fail as compared to foam which took an average of 267 seconds, the second longest lasting treatment. Conclusions/Discussion Both foam and gel are nontoxic compounds which work better than water at keeping structures from burning. Foam worked better than water in all temperatures, but sometimes only by a little. The gel protected my test boxes much longer than any other treatment. I have concluded that the best thing to protect a structure from a wildfire would be sodium polyacrylate gel. | |
| Summary Statement I tested three different fire retardants: water, class A foam, and sodium polyacrylate gel to see which would be most effective in protecting a house from wildfires. | |
| Help Received | |