



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Daniel J. Combs	Project Number J1108
Project Title How Fire-Safe Is Your Baby? Do Flame-Resistant Baby Clothes Lose Their Effectiveness after Repeated Washings?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my project is to see if flame-resistant baby clothes lose their effectiveness after repeated washings. My hypothesis is that the older, washed flame-resistant polyester garments will catch fire more easily than the new, unwashed flame-resistant polyester garment because the flame retardant will have washed away.</p> <p>Methods/Materials My procedure was to place a 4" square sample of fabric on the burn platform. I placed the lit candle 2" below the sample and simultaneously started the stopwatch. My mom wrote down the ignition times while I kept track of the burning process. My materials were: burn platform with grill, small oil lamp, 1" diameter tea candle, lighter, fire extinguisher, stopwatch, camera, notepad. Fabric samples: 2 washed flame-resistant polyester, 1 unwashed flame-resistant polyester, 1 cotton non flame resistant, 1 sample Nomex, 1 denim.</p> <p>Results For all of the polyester samples, when indirect flame was applied, they didn't catch fire; a hole melted in the fabric. With indirect flame the unwashed polyester garment took longer for a hole to appear and also to finish forming. However, when a direct flame was applied, the 2 polyester samples that had been repeatedly washed, did better. They took longer to catch fire and stopped burning sooner than the unwashed polyester garment. The Non flame-resistant cotton garment took longer for a hole to appear, but once it did it caught fire and continued to burn until the entire sample was consumed.</p> <p>Conclusions/Discussion My hypothesis was partially correct. The new polyester garment did better with indirect flame, but when direct flame was applied, it caught fire sooner and burned longer than the other garments. I was concerned with how the polyester fabric burned. The oil-resin that dripped from the burning fabric would probably stick to the skin and cause a far worse burn than they would get if the garment were cotton.</p>	
Summary Statement Do flame-resistant baby clothes lose their flame retardant qualities after repeated washings?	
Help Received Mom took notes, helped type report and decorate display board. Dad helped build the burn platform and took photos.	