



**CALIFORNIA STATE SCIENCE FAIR  
2010 PROJECT SUMMARY**

<b>Name(s)</b> L. Alexis Coon	<b>Project Number</b> <b>J2208</b>
<b>Project Title</b> <b>Hot! Hot! Hot! A Study of Factors Affecting the Flame Resistance of Children's Sleepwear</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective is to determine how easily flame retardants can be maintained or worn down and to determine which type of fabric (cotton, cotton treated with flame retardants or polyester) is the safest to wear.</p> <p><b>Methods/Materials</b> Three types of pajamas were tested: cotton, cotton treated with flame retardants and polyester fabric. Each piece of the pajamas (top and bottom) was cut up and put into a group of three samples of the same kind of fabric. Then each group of samples was washed with fabric softener or one of a variety of cleaning agents, or they were left unwashed. After drying, the pajamas were exposed to flame for thirty seconds with a lighter.</p> <p><b>Results</b> Except for the chlorine bleach, all of the products used affected the pajamas in the way I predicted. Cotton ignited quickly, polyester did not ignite at all and cotton treated with flame retardants had varying results. Most of the time, the flame retardants could be worn down after just one washing with a non-recommended product.</p> <p><b>Conclusions/Discussion</b> My conclusion is that polyester is the safest material to wear when around an open flame. Fabric softeners fluff fabrics up, allowing more oxygen for combustion. Polyester's fibers are already tightly knit, and this is why polyester was unaffected. Plain cotton pajamas ignited too easily and pajamas treated with flame retardants are just too unpredictable and difficult to maintain.</p>	
<b>Summary Statement</b> My project tested the effect of the washings and cleaning agents on flame retardant chemicals in children's sleepwear, naturally flame resistant fabric and flammable fabric.	
<b>Help Received</b> My father (Derek Coon) operated the lighter since I could not turn it on; my mother (Kristine Coon) helped align and glue down the background fire paper and main title letters. She also taught me how to operate a Cricket machine to cut letters.	