



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Haleigh E. Lunas</b>	<b>Science Fair Use Only</b>  <h1 style="margin: 0;">J1022</h1>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>What Type of Baby Clothes Are Most Flame Resistant?</b>	<b>Division</b> <input checked="" type="checkbox"/> <b>Junior (6-8)</b> <input type="checkbox"/> <b>Senior (9-12)</b>
<b>Preferred Category</b> (See page 5 for descriptions.) <b>10 - Materials Science</b>	
<b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p><b>Objective:</b> This experiment was designed to determine what types of sleepwear are not flame resistant and which types are safest garments to dress an infant in for sleeping.</p> <p><b>Materials/Methods:</b> Seven pieces of new infant sleepwear were used; each made with different fabrics, both natural and synthetic (man-made). I used garments made of combed cotton (tight weave), uncombed cotton (loose weave), polyester and nylon. Two of my samples had fire retardant chemicals added to the fabric prior to the manufacturing of the garment. Each piece was marked at the midway point for comparison of burn times. One piece at a time was then ignited by an open flame. The time for the sleepwear to burn was measured up to the midway point, notes taken and results were graphed.</p> <p><b>Results:</b> The fabrics all burned at different speeds and I observed that the fabrics also flamed differently. For example, the cotton fabrics (both types) burned rapidly in an open flame while the 100% polyester burned holes and then extinguished itself rather quickly. Only one of the pieces that had flame retardant chemicals added, and was labeled "flame resistant," burned the slowest -- but it did burn! (This was the only one that complied with the Consumer Product Safety Commission's prior standard.)</p> <p><b>Conclusion and Discussion:</b> I found that fabric treated with fire retardant chemicals does burn the slowest with the least open flame. I was surprised to find that these fabrics burned at all. They burned so that the material melted, which would still cause severe burning on the skin. The experiment showed that even fire retardant fabrics will burn when exposed to an open flame. The untreated fabrics burn much faster and with more heat. The CPSC has recently relaxed its standard with regard to fire retardant sleepwear. Parents are choosing more often to dress their infants in more comfortable cotton fabrics and not the itchy, heavy "blanket sleepers" which were typically the only fire resistant pajamas on the market. They did not prove to be fire resistant. Another approach to this experiment would be to use contact with a very hot source instead of an open flame to see what would result. New standards have recently been set by the CPSC which encourage sleepwear to fit very tightly on the infant in order to decrease the oxygen that would be needed to feed a fire.</p>	
<b>Summary Statement</b> (In one sentence, state what your project is about.) My project is about the flammability of fabrics used in infant sleepwear on the market today.	
<b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. My Mother helped type my report and took pictures while I set an open flame to infant sleepwear.	