



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Andrew L. Zellman	Project Number J1534
Project Title I'm Camping, I'm Cold, and I'm Cranky: Which Insulating Sportswear Fabric Will Make Me the Happiest Camper?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I often go camping with my family and Boy Scout troop. While camping I am often exposed to cold, windy and wet weather. At these times, I get cold and a little bit cranky. The goal of my research is to determine which fabric commonly used in making sportswear and camp clothes is the best insulator and will keep warmest and make me the happiest camper. My hypothesis is that the synthetic fabrics will be better insulators than natural fabrics. They are used more often for low-temperature sportswear and have been specifically designed for this purpose</p> <p>Methods/Materials Five one-quart glass jars were wrapped with insulating fabrics; wool knit, cotton fleece cotton knit, Polartec200, and Thinsulate. A sixth jar was not insulated to serve as a control. One quart of 120°F water was poured into six glass jars. Metal, threaded lids with laboratory thermometers inserted were screwed on jars. Thermometers were positioned about 2" above base of jars. Jars placed on insulating pad in the refrigerator. Immediately recorded water temperature readings of each treatment & refrigerator air temperature. Continued readings every 15 minutes for two hours. Experiment replicated five times.</p> <p>Results Thinsulate was consistently the best insulator of the five sportswear materials tested. Two of the natural fabrics, cotton fleece and wool, performed about the same, but with lower values than Thinsulate. Cotton knit and Polartec performed similarly, but with lower values than cotton fleece and wool. I was surprised by the poor performance of the other synthetic fabric, Polartec, as it scored the lowest ranking of the five fabrics I tested.</p> <p>Conclusions/Discussion Based on my experiment, it seems to me that not all synthetic fabrics are created equal when it comes to living up to their manufacturer's claims of superior performance. In cold weather, I will wear a Thinsulate jacket. If it is just a little bit cold, I will put on my sweatshirt or wool sweater.</p>	
Summary Statement I evaluated five common synthetic and natural sportswear fabrics for their insulating abilities in cold conditions	
Help Received My teacher, Danny Armanino, kept me organized and on-schedule. My grandmother loaned me the jars. My mother helped me with the board display. My father loaned me the thermometers and showed me how to use Excel to create the charts and tables	