



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> Kyle T. Yamamoto	<b>Project Number</b> <b>J1543</b>
<b>Project Title</b> <b>Insulating Clothing Material vs. Cold Weather: Which Insulating Clothing Material is Most Effective?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> My objective is to determine which insulating clothing material is the most effective at preventing heat loss against cold weather.</p> <p><b>Methods/Materials</b> Ten different insulating clothing materials of identical size with different insulating/air trapping capabilities were tested against a control. The controls was an uninsulated one liter glass jar of hot water with a starting temperature of 86.6 degrees C. that was placed in a refrigerator with a temperature of 5 degrees C. Temperature readings were taken at 15 minute intervals for one hour on ten trials. Another one liter glass jar of hot water was wrapped in the insulating material to be tested, placed in a cardboard box then put into the refrigerator with temperature readings taken as with the control for ten trials. All materials were tested in a similar fashion.</p> <p><b>Results</b> Polartec consistently had the lowest heat loss rate with an average of 9.17 degrees C. lost in one hour. I also noticed that the natural insulating materials, i.e. wool, cotton, and down did not insulate as well as the synthetic materials, especially polyester. Plus, condensation of moisture affected the insulating properties.</p> <p><b>Conclusions/Discussion</b> The insulating clothing material versus heat loss over time tests supported my hypothesis that the Polartec material was the most affective at preventing heat loss against cold weather. Also, polyester was the major component in the most effective insulating materials, so the way these three materials are fabricated in order to trap air is extremely important in insulating efficiency.</p>	
<b>Summary Statement</b> My project is about finding which insulating clothing material is most effective at preventing heat loss against the cold weather when compared to other insulating clothing materials.	
<b>Help Received</b> My parents offered financial support and transportation. My aunt let me use her digital thermometer. My sister let me use her color printer and she took pictures of me while I posed. My mother assisted with mounting my board.	