



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Dominic Schillace; Benjamin Zdasiuk</b>	<b>Project Number</b> <b>J2125</b>
<b>Project Title</b> <b>Survival Blanket Showdown: Testing the Heat Retention of Survival Blankets and Other Lightweight Insulators</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Our objective was to test the heat retention performance of different survival blankets and alternative insulators in the outdoors. We also wanted to determine the mechanisms by which heat was lost in our experiments and how the results were affected by human-like heat production.</p> <p><b>Methods/Materials</b> Eight buckets filled with 10 liters of hot water each simulated a human. We wrapped seven of them in different types of survival blankets/insulators, then measured temperature drop overnight outdoors using a thermocouple thermometer. We repeated the experiment for a total of four trials, systematically switching positions to eliminate any possible location-based bias. Additional experiments used data loggers to measure time dependence, bucket heaters for better human analogs and different insulators underneath the buckets to investigate losses due to thermal conduction.</p> <p><b>Results</b> Every one of the lightweight metal-coated film blankets reflects heat back into a bucket better than the other types of blankets do. The Adventure Medical Heatsheets Blanket was best; it barely surpassed the Adventure Medical Bivvy, which we had hypothesized would do best. The bubble wrap was the worst of the blankets/insulators but still better than the (blanket-less) control. We also found that radiative loss dominated conduction and convection losses in our experiments.</p> <p><b>Conclusions/Discussion</b> Our conclusion is that a metal-coated film survival blanket will keep you warmer than any other insulator in a survival situation. This type of blanket is very light, weighing less than many other insulators. You should always carry one when hiking.</p>	
<b>Summary Statement</b> We tested the heat retention of different survival blankets and insulators, finding that lightweight metal-coated film survival blankets are definitely worthwhile.	
<b>Help Received</b> The people assisting us were parents Julie Fouquet, George Zdasiuk, Angela Schillace, and Sam Schillace. They helped with the design and physical labor of setting up the experiments, Microsoft Excel and editing the write-up.	