



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Lilliya S. Reid	Project Number J1325
Project Title Safe and Cold	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I wanted to create a lunchbox/personal cooler that would keep food at safe temperatures for at least five hours. I designed a prototype of a cooler using a carbon based aerogel as the insulating material along with separate cooling and dry goods compartments, My goal was to design a lunch/personal cooler which would keep its contents cold enough to comply with the USDA temperature recommendations for perishable food safety.</p> <p>Methods/Materials The method I used to measure the temperature of the coolers was to pack a typical lunch; turkey sandwich, yogurt stick, granola bar, pretzels, and a tangerine and a readily available medium-sized igloo freezer pack. I used a probe thermometer with an extension cord inserted into a turkey sandwich to test the most perishable item's temperature. All of the tests were done for exactly five hours. There were two trials for each cooler. I also decided to do another test on my aerogel cooler design where I put all of the perishable foods on the bottom and the dry foods in a separate compartment on the top.</p> <p>Results The tests showed that the aerogel insulated cooler with a widely available medium ice pack kept the lunch food perishables colder than the other coolers. The data that I recorded also suggests that the commercially available lunch boxes do not keep perishables at safe temperatures below the 40 degrees recommended by the USDA.</p> <p>Conclusions/Discussion I concluded that the name brand coolers are not safe because the food was only briefly at the food safe temperatures that inhibit bacterial growth. I also learned, during my tests, that aerogel is a super insulating material that works even better when there is separate dry storage as in my design. The aerogel insulated lunch cooler that I designed and made could also have other applications such as pumped breast milk storage, or even short term severed limb transport for emergency vehicles or military field medics.</p>	
Summary Statement My project was about testing an aerogel insulated cooler that I designed against two common, name brand, personal coolers.	
Help Received Consulted mother on grammar.	