



**CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY**

Name(s) Lilliya S. Reid	Project Number 34705
Project Title Safe and Cold	
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. Abstract 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. 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. 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.	
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.	