



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Claire M. Clifford	Project Number J1208
Project Title Which Travel Mug Insulates Best?	
Abstract Objectives/Goals My objective was to determine which commercially used travel mug would be the best insulator for a hot beverage for the longest time period. Methods/Materials Five types of travel mugs composed of plastic, stainless steel, and a combination of the both were selected. An electric teakettle to boil water and a digital thermometer were used to measure water temperature. A specified measured amount of boiling water was poured into each of the mugs, and the starting temperature was measured and recorded before the lids were placed on each mug. Water temperature was measured after specific time increments for the mugs. Results It was determined that the double walled stainless steel mug insulated water the best for the longest period of time and at the end of the experiment it kept the water the hottest. The poorest insulator, however, was the single walled plastic mug. Conclusions/Discussion After testing was completed I determined that the double walled stainless steel mug was the best insulator, and this supported my hypothesis. I believe this occurred because metal is a better conductor of heat than plastic. In addition, the air pocket in the double walled mugs causes the heat to travel through one layer and stays trapped in between the two layers instead of going through the second layer and escaping. Since the heat takes a greater time to get though the second layer, the water remains hotter for longer, and the outside of the mug stays coolest to the touch.	
Summary Statement Tested commercially purchased travel mugs to determine which material would insulate hot water for the longest time.	
Help Received My mother helped me pour boiling water into the travel mugs, and took photographs while I measured temperature readings.	