



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

Name(s) Gregory S. Wiese	Project Number 22306
Project Title Sunshade	
Objectives/Goals Objective: Three types of vehicle window shades were tested to assess their effectiveness in reducing vehicle interior temperature. Methods/Materials The three tested sunshades were made of nylon, foam or cardboard. Each were compared with each other and with a control of no sunshade. Temperatures inside and outside the vehicle were recorded every half-hour between 9:00 AM and 3:00 P.M. Measurements were made on sequential sunny days. Data were collected on two days for each shade and for control and the data averaged over the two separate measurement days. For statistical analysis the value of (Interior - Exterior) / Exterior temperatures was computed. The values of this ratio over three two-hour periods were compared using student's t-test . Results The numerical results are listed in table 1 in the log book (duplicated on display board.) During the first two-hour period (9-11AM) there was no significant difference between control values and any of the three window shades. During the second two-hour period (11AM - 1PM) each of the window shades significantly lowered interior temperature to at least the $p < .01$ (p =probability) level of significance. During the third two-hour period (1-3PM) each of the shades significantly lowered interior temperature to at least the $p < .001$ level of significance. There was no significant difference between the shades in their ability to lower interior temperature during any of the test periods. Conclusions/Discussion The three types of sunshade all significantly lower the inside temperature of the vehicle on sunny days. This effect became more pronounced as the exterior temperature increased. There was no statistically significant difference between the shades in their ability to lower interior vehicle temperature.	
Summary Statement Three types of vehicle window shades were tested to assess their effectiveness in reducing vehicle interior temperature.	
Help Received Grandfather: For use of his greenhouse thermometers. Mother: For help with producing backboard display. Father: For help with statistics. Mr. Bartel: For guidance.	