



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Justin G. Lee	Project Number J1520
Project Title Water, Lawn, and Astroturf: How Do Ground Materials Transfer Solar Heat?	
Abstract Objectives/Goals The purpose of this project is to find out how solar heat is being absorbed, conducted, and radiated by different ground materials. What ground material is the friendliest to its surrounding by having the least increase in its surface and surrounding temperature when heated and retaining heat the best when cooled. Methods/Materials Six ground materials (lagoon water, lawn, Astroturf, sand, soil, and asphalt) were placed under a 250 watt heat lamp to check the change in temperature of each material with the heat lamp on and then off for 30 minutes respectively. Temperature measurements were taken on the material surface, 1 inch below the surface and on the ambient air to examine how the materials absorb, conduct and radiate heat. Results The experimental results showed that Astroturf transfers heat mainly through absorption and radiation with very little conduction. Water absorbed and emitted heat much slower than solid ground. The temperature data supported my hypothesis that water has the lowest temperature gain when heated and the lowest heat loss when cooled. Conclusions/Discussion Water is the friendliest ground material to the surrounding. Lawn is the second friendliest with a low sub-surface temperature and moderate surface and air temperature. The most unfriendly ground material is Astroturf with the highest surface and air temperature.	
Summary Statement My project was about examining how different ground materials transfer solar heat to its surrounding.	
Help Received Mom helped with purchasing materials and editing my report. Dad suggested hanging the heat lamp on a tripod and provided advise on the layout of the display board.	