



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Jillian A. Stokes	Project Number J1535
Project Title The Solar Heating and Night Cooling of Surfaces	
Abstract Objectives/Goals In this project I investigated the question of how various colored surfaces heat up in the sunlight during the day and how they cool under the open night sky. Methods/Materials In order to answer the question I set a number of the samples with different paints on them on a foam insulation pad on the ground outside. Then I let them heat in the sun during the day and cool under a night sky. I chose times when the weather was fairly clear. Then I measured the temperature at various times using a hand-held infrared thermometer. I kept track of the air temperature during the experiment. During the day I measured sun elevation because the angle that the sun hits the samples determines how much light energy they receive. Results In this experiment I found that the paint temperatures were at their highest point during midday and decreased as the sun angle decreased. At night the paints were all closely related in temperature, but the average temperature showed only a moderate change throughout the night. The paints were significantly hotter than the air during the day, and at night and in the late afternoon were actually cooler than the air. Conclusions/Discussion The color of a surface affects how much light it reflects. The light energy not reflected by a paint turns to heat energy and raises the temperature. Energy conservation can be accomplished in many different ways and paint color is one of them. This experiment may apply to transportation vehicles and selecting a color paint to help keep the vehicle at a suitable temperature. It may also be a valuable procedure in the construction of energy-efficient houses.	
Summary Statement I studied how color of paint affects the temperature of 16 metal squares in sunlight and under the night sky.	
Help Received Used infrared thermometer from Dad's work. He showed me how to do tables and graphs on the computer, and helped me collect data.	