



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Julianna L. Morton	Project Number J1814
Project Title Heat Wave: How Colors Affect the Absorption of Light Energy	
Abstract Objectives/Goals The scientist tested to see what color paper absorbed the most light energy from a 100 watt incandescent light bulb. The scientist's hypothesis was that the following colors, in order from those that would absorb the greatest amount of heat to those that would absorb the least would be: black, blue, green, red, yellow and white. Methods/Materials METHODS 1. Place the poster board with colored circle 12" below the desk lamp. 2. Turn on the desk lamp and allow it to shine on the colored circle for 20 seconds. 3. Turn off the desk lamp and immediately measure the surface temperature of each slice of the colored circle using the FLIR infrared thermographic camera. 4. Rotate the poster board with colored circle 1/6 of a turn and repeat steps 1-3 five more times. MATERIALS 6 8 1/2" x 11" sheets colored construction paper. 1 11" x 14" sheet of white poster board. 1 Desk lamp with 100 watt incandescent bulb. 1 FLIR infrared thermographic camera. 1 Stopwatch. Results The results of the experiment, from those that absorbed the most light energy to those that absorbed the least were: black, green, blue, red, yellow and the control color, white. This result was mostly consistent with the research because darkest colors absorbed the most light energy and convert it to heat energy. Conclusions/Discussion Several factors affect a material's ability to absorb light energy and convert it into heat energy, including color, texture and light source. The texture was controlled by using construction paper that was identical other than color. The light was controlled by using the same light source. This experiment was important because it provided information as to how to select colors for materials used on a daily basis. For example, the materials chosen to heat the water in a swimming pool should be black since black materials absorb more light energy. Conversely, one may want to choose a lighter color of car as it would remain cooler in the summer sun.	
Summary Statement The purpose of this experiment was to test what color paper would absorb the most light energy from a 100 watt incandescent light bulb.	
Help Received My Father helped me use the thermographic camera because it is very delicate and expensive.	