



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Susanna G. Murray	Project Number J0726
Project Title From Sunlight to Light Bulbs	
Abstract Objectives/Goals The purpose of this project was to find out the efficiency of collecting, storing, and reproducing solar energy to produce artificial light. The hypothesis was the efficiency would be less than 10% and the LED would be best for reproducing the energy. The controls in this experiment were the amount of time the solar panel collected solar energy and the location of the solar panel. The variables were the types of light bulbs and the uncontrollable variables were the weather, battery voltage, and the number of lumens outputted. Methods/Materials There were three types of light bulbs: the incandescent, fluorescent, and LED. They were each tested 7 times creating a total of 21 tests. Each test included collecting solar energy for 9.5 hours, with the solar panel connected to the battery where the energy is stored. Then, at night one of the three lights was turned on, and the lumens or light outputted was measured and an hour later the light was measured again and the same after two hours and so on if it was still running. Materials include one incandescent, fluorescent, and LED light, solar panel, 2 lead-acid batteries, light meter, Fluke Multimeter, and one mounting board. Results The results of this experiment were that the LED lasted a lot longer than the fluorescent and incandescent light and that the efficiency was 2%. Conclusions/Discussion It was concluded that the LED was the most efficient light for reproducing the energy because it lost less energy in the form of heat and saved up more energy to produce light. The overall efficiency using the LED was 2%, which proved the hypothesis correct. I knew that the efficiency of using solar energy was low, but it was surprising to discover that the energy left over was only 2% out of the original 100%.	
Summary Statement The purpose of this project is to find the efficiency of collecting, storing, and later reusing solar energy to produce artificial light and the most efficient light type for doing so.	
Help Received Dad helped get supplies and helped set up apparatus for experiments.	