CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22453

Project Title
Somewhere Under the Rainbow! The Effects of Angle, Elevation, and Type of Light on the Efficiency of Solar Power Cells

Abstract

Objectives/Goals
My project was to determine if the angle, elevation, or type of light striking a solar panel would affect th€ output of the panel.

Methods/Materials
I used a solar panel from a K-NEX kit and a digital volt meter. I designed a stand for the panel and a ferri€ wheel to measure RPM. To measure angles in 15 degree segments I used wood to build an apparatus withx an adjustable dial. Lighting gels and a lamp were used for different types of light. Multiple readings were taken and averaged for variables of angle, elevation, and light. Sunlight readings were taken at midday between 11AM and 2PM.

Results
My data showed the optimum angle for a solar panel is 90 degrees, with the best range between 45 andx 135 degrees. Sunlight performed better than any colored or artificial light. Elevation increased output, but€ with a narrower range of performance. Readings at 1000' in the San Fernando Valley were lower than sx level, possibly because of pollution. In comparison of volts to RPM, RPM remained fairly constant until volts dropped below motor requirements.

Conclusions/Discussion
My hypothesis was correct. Angle, elevation, and type of light do affect the efficiency of solar panels. The€ results show the importance of location and proper installation of solar panels. Also, the effect of polluti€ on some results shows the effect a clean atmosphere has on the purity of sunlight and solar energy.

Summary Statement
My project is about achieving the highest efficiency from solar power and the importance a non-polluted atmosphere has on solar energy.

Help Received
My mom helped with typing and cutting for the display. My dad supervised the building with power tools and did the driving. He also advised on making computer charts and graphs.