CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J0840

Project Title
Dependability of Solar-Powered Cars

Abstract

Objectives/Goals
I am concerned about harmful effects of global warming due to our use of gas-powered cars. I conducted this experiment because I was curious to find which hour of the day a solar-powered car would work best. I studied the relationship between the Sun's angle and the car's speed. This information would be important in the development and use of solar-powered cars.

Methods/Materials
Procedures
1. Place solar-powered car on a wide, flat surface (without incline) at 9 am.
2. Record how long it takes to reach 9.5 feet (which corresponded with a concrete slab of my sidewalk.)
3. Repeat this every hour, on the hour, until 3 pm. Get 5 timings for each trial.
4. Find the mean (after eliminating the high and low outliers) for the time it took to reach 9.5 feet for each hour. Compare averages for each hour.
5. Note the lowest average which will show which hour the car worked best .

Materials: Klutz The Solar Car Book. Car dimensions=9" L x 4.5" W x 1.5" H; Casio digital stopwatch; Durtex 12 feet 0.5 inch-wide measuring tape; Notebook; Pencil; Calculator.

Results
The data shows that 12 pm timings were the fastest. This was followed by the 11 am, 1 pm, 9 am, 3 pm, and 2 pm timings, respectively. Wind and temperature did not affect the car's performance while cloud-cover did. On cloudy days we couldn't collect data because the car slowed down significantly or even failed to work. We were careful to avoid casting our shadow on the car's path. Direct sunlight was the most important factor, even on a cold day.

Conclusions/Discussion
The data showed that the solar-powered car worked best at 12:00 pm. These results are consistent with my hypothesis. This is probably due to the fact that the Sun's light rays were perpendicular to the solar panel allowing it to operate optimally. The Sun's light is solar radiation. In a solar-powered car, this light energy is converted into potential energy in the solar panel. Kinetic energy is demonstrated when the car moves. The panel is made of photo-voltaic cells which is a battery that makes electricity from light. When sunlight strikes the cell, electrons get displaced. It's the movement of the electrons in the same direction that creates an electric current that does the work. It would be more convenient to let the solar panels charge during optimal hours and then store the energy in a battery. This way we can drive when

Summary Statement
Find what times during the day solar-powered cars work best

Help Received
Father helped write readings. Mother helped glue board