



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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| Name(s) Gareth C. Wang | Project Number J1038 |
| Project Title Constructing and Testing a Practical Solar Powered Vehicle | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this project was to determine if it is possible to build a practical solar powered vehicle that can be used for everyday errands and tasks. This vehicle needs to be affordable, have a long enough range and a suitable speed to be used as a delivery, shopping, and transportation vehicle. In rural countries, bicycle ambulances are used and a solar vehicle could be a quicker way of getting someone to the hospital. I wanted to do this project because I am very interested in cars, but also want to help the environment.</p> <p>Methods/Materials First, selected key parts including the electric motor, batteries, solar panels, a base vehicle, and a Maximum Power Point Tracking Charge Controller. Parts were chosen based on affordability and performance. Next, design the vehicle. But problems kept cropping up at each stage of the design, such as when the solar panels were too big to fit on the base vehicle. Two tests were performed: a practicality test, which included solar panel charging time, average speed, all electric range, and top speed, and a performance test (time to speed and time to distance). The procedure was: 1. Record date and time 2. Perform test drives or charge batteries. 3. Record results.</p> <p>Results The average speed of the solar vehicle was 12.1 km/h, the top speed of the vehicle was 35.2 km/h, and the solar panels charged the batteries in 4 hours. Fastest times for 54.5 kg person in time to speed test: 0-25 km/h: 13.03 sec. 0-25 km/h with pedaling: 10.09 sec. Fastest time for 54.5 kg person in time to distance test: 0.5 km in 1.27 minutes. Fastest time for 77.3 kg person in time to speed test: 0-25: 15.6 sec. Fastest time for 77.3 kg person in time to distance test: 0.5 km in 1.1 minutes.</p> <p>Conclusions/Discussion The hypothesis was correct; it is possible to build a practical solar powered vehicle. This vehicle has lots of luggage space, the solar panels charge quickly, and the speed and range are suitable for local errands. The more experience I had with the vehicle, the better the performance I was able to get out of it. This vehicle will also pay itself back in saved gas money and it is a lot better value than similar vehicles on the market.</p> | |
| Summary Statement My project is about designing, building, and testing a solar powered vehicle. | |
| Help Received Godfather operated dangerous woodworking tools and allowed access to other tools; Father taught me about hardware tools and basic electrical concepts. | |