



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Joshua M. Arreola	Project Number S0901
Project Title Jump-Starting the Electric Car: Improving the Lifespan of Electric Car Batteries by Means of a Generator	
Abstract Objectives/Goals The objective of my project was to determine if it would be possible to harness the kinetic energy from a model car axle to turn a generator, and use the electricity gained from the generator to recharge a battery. Methods/Materials I first created a replica of a car axle using a wooden frame and dowel. I then attached a homemade generator to the middle of the dowel/axle. For the experiment, I fully discharged a 1.2V AA rechargeable battery and attached it to the generator. I used an electric drill to turn the axle and the generator for one hour, checking and recording the voltage of the battery every fifteen minutes; I repeated this step with three other fully discharged batteries. I then hooked up each battery to a 1.5V Mini-Lamp for two hours and recorded their voltages every thirty minutes to see if the generator fully recharged the batteries. I repeated this step with four fully charged batteries to see how long they would last compared to the recharged batteries. These were my control batteries. Results My results showed that the generator was successfully able to recharge the fully discharged batteries, but 3/4 of them did not last as long as the fully charged batteries. During the experiment, I discovered that the experiment I performed only showed that the generator would recharge a battery. What I was trying to see is if a motor could run a generator which could recharge the battery that was running the motor. Further research, however, helped me realize that I would have made a perpetual motion machine, which would not have produced any results, so I continued with this experiment in order to achieve some results. Conclusions/Discussion My results showed that my hypothesis was somewhat correct. The car axle replica was able to harness enough kinetic energy to power the generator and recharge the batteries, but they did not last as long as the fully charged batteries. For future experiments, I would try alternative methods of improving the efficiency of the batteries by testing solar cells and regenerative braking. I would also run the experiment with different types of rechargeable batteries and run longer trials. This experiment could greatly increase the efficiency of electric cars and help reduce the use of gasoline-powered vehicles.	
Summary Statement This project was conducted to determine if it would be possible to harness the kinetic energy in car axles to turn a generator, and use the energy gained from the generator to improve the lifespan of electric car batteries.	
Help Received My dad helped me construct the framing to hold the car axle. My mom purchased the materials, took pictures, and pasted some of my board. I received advice and mentoring from Mr. Bradford Oliver and Dr. Charles Hurst, both engineers.	