



**CALIFORNIA STATE SCIENCE FAIR
2017 PROJECT SUMMARY**

Name(s) Anay Bhakat	Project Number J1001
Project Title Increasing Effective Range of Electric Vehicles Using Electromagnetic Induction	
Abstract Objectives/Goals Using fossil fuel in vehicles significantly harms our environment by releasing about 1.5 Billion metric tons of CO ₂ and many other poisonous gasses into the atmosphere every year. Plug-in Electric Vehicle (PEV) can help alleviate these problems. However, the adoption of PEVs has been slow as the vehicle range is limited by its battery size. The objective of this experiment is to demonstrate the possibility of wirelessly charging PEVs while driving along highways using Electromagnetic Induction technology. As a result of this, PEVs will have a much longer range without any additional cost and that would lead to faster adoption. It is a Win-Win proposal for the environment, our long-term health, and the overall economy	
Methods/Materials We used a model track, an electromagnetic transmitter, an electromagnetic receiver, a car chassis, and an oscilloscope to demonstrate electricity transmission from the track to the car without wires. We also measured the frequency of change of the magnetic flux and the amplitude of the generated voltage.	
Results We demonstrated that electricity can be transmitted from the road to the car without wires. The efficiency of the voltage generated in the receiver was measured by changing the number of coils and the distance between the transmitter and the receiver.	
Conclusions/Discussion My tests have shown that wireless charging for electric cars is a viable option. Further enhancements have to be made for safety and efficiency before it is ready for commercial usage.	
Summary Statement My experiment proves that wireless charging is a viable option for charging electric cars using electromagnetic induction.	
Help Received I designed the track and the experiment myself. I received theoretical knowledge about Electromagnetic Induction and Oscillator from Rajib Bhakat and Khan Academy's Course on Electromagnetic Induction	