CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
Khush M. Kharidia

Project Number
J1023

Project Title
Converting Human Energy into Electrical Energy

Abstract

Objectives/Goals
Energy and health care are two important issues facing our nation. I am motivated to address both issues simultaneously. My project is about Converting Human Energy into Electrical Energy. It demonstrates that you can exercise and charge your small electronic gadgets at the same time. In my project, I wanted to find out how much cell phone talk time I can get if I ride my bicycle for 15 minutes. I guessed I would get 15 minutes of talk time for fifteen minutes of riding time.

Methods/Materials
A bicycle is often used to exercise in fitness centers. Attaching a dynamo generator to a bicycle will convert human energy into electrical energy. An AC to DC converter circuit can convert the AC voltage from the dynamo into a 5V DC. The 5V DC can be used to operate many small electronic gadgets. I charged my cell phone by connecting it to a 5V DC output from the AD/DC converter circuit. First I measured dynamo output for different riding speed. Then I selected a proper speed that will operate the AC/DC converter. At a constant bicycle speed, I measured the cell phone talk time for different bicycle riding times.

Results
The AC voltage generated by the dynamo is proportional to the speed of the wheel. This followed Faraday's law of induction. It took me fifteen minutes of riding time to get 13:30 minutes of talk time. I observed that the cell phone charges more when the bike is ridden longer. My circuit gave 0.5W of output power to charge the cell phone. A 1.0W of output power should be sufficient enough to get 15 minutes of talk time for 15 minutes of riding.

Conclusions/Discussion
We can take advantage of calories burned during exercise to operate electronic gadgets. More importantly, the energy generated through my project is clean. It is a way forward towards environmental friendly energy called "Green Energy". My hypothesis did not come out to be exactly true but it was very close. In addition, I also learned about AC/DC converter circuits, a dynamo, and Faraday's Law of induction during my project.

Summary Statement
Ride a bicycle to exercise and create clean energy while riding to charge low powered gadgets.

Help Received
Mr. Ben Guansing for guidence, Ms. Meera Datta for correcting report, Mehul Kharidia for collecting materials