CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
Ryan G. Patrick

Project Number
J0122

Project Title
Wind Turbine Energy

Abstract

Objectives/Goals
The objective for this experiment was to investigate the electrical voltage that could be generated at a given wind speed using a simple wind turbine design.

Methods/Materials
To start the project I constructed a wind turbine using a set of plans I found on the internet. Most of the materials for the construction of the turbine were purchased at a hardware store, online or found in my grandfather's garage. Once built, I spun the turbine by hand to see if it would light a low voltage LED. Prior to collecting data, I set up a voltmeter to read ac voltage and a wind meter to read mph. In order to control the wind velocity I used a two speed hairdryer and varied the distance between the dryer and turbine. I obtained rare earth magnets of different thicknesses to check the affect this has on the electrical output of the turbine. I documented the readings from both meters to allow me to graph the results and make my conclusions.

Results
As the wind speed increased so did the voltage. I tested four 1/4" thick by 1" diameter magnets and four 1/8" thick by 1" diameter magnets. While collecting the data I found that it required more wind speed to create the same voltage for the thicker magnets. I'm sure this is due to the increased mass of these magnets.

Conclusions/Discussion
The objective for this experiment was a success. Next time to expand the project I will use coils with more turns. I believe this will have a positive affect on the power generated. During the experiment I realized that the magnets were affected by centrifugal force, since one of the magnets detached from the rotor during the experiment.

Summary Statement
My project demonstrates the wind speed it takes to create electrical voltage using a simple turbine.

Help Received
Father helped with cutting bottles, winding coils and emphasized safe use of table and band saws.