CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J0232

Project Title
It's the Blades That Count

Abstract

Objectives/Goals
My project involves the testing and research of wind turbine design and the electricity it generates. I am interested in this subject area because there has been much discussion and debate about changing the way America generates electrical power. One alternative energy source often suggested is the use of wind power. I want to determine if the number of blades on a wind turbine has a direct affect on the amount of power the wind turbine will produce. My hypothesis states: if a wind turbine contains more blades, then it will generate more electricity than a wind turbine that contains fewer blades.

Methods/Materials
I began my experiment by constructing a replica of a wind turbine. I used a cardboard box to simulate a wind tunnel which housed a generator mounted on a metal base. To make the wind turbine blades, I glued model airplane propellers together in sets of 2, 3, 4 and 6 blades. Next, I attached a set of blades to the generator and turned on a fan which served as the wind source. I then recorded the voltage that the wind turbine produced shown on the multi-meter. I repeated this three times with each set of blades.

Results
After analyzing the data, I recorded the results. The wind turbine with three blades produced the greatest amount of energy. The turbine with four blades produced less energy than wind turbine with three blades. The turbine with six blades produced even a lesser amount energy than the turbine with four blades. Finally, the wind turbine with two blades produced the least amount of energy out of all of the blades.

Conclusions/Discussion
I concluded that a wind turbine containing three blades generates the most amount of electricity. Wind turbines with greater or less than three blades do not produce the same output of electricity.
If I were to conduct this experiment again, I would test the four wind turbines used in my experiment at different wind speeds. I would also test a larger sample of blade sets with varying shapes and sizes. This project can benefit society in several ways. Wind power could prove to decrease the dependence on fossil fuels and other non-renewable energy sources. It is beneficial to society because it is a clean energy source that does not produce carbon dioxide, mercury or any other type of air pollution. Investing in wind power is a smart and necessary move for an economical and ecological future.

Summary Statement
My project involves determining how the number of blades that a wind turbine contains affects the amount of electricity it generates.

Help Received
Parents purchased materials for project. Father supervised the soldering and electrical procedures of the experiment.