CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
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Project Number
J0707

Project Title
Touched by an Angle: Which Angle of a Windmill Blade Will Produce the Most Energy?

Abstract

Objectives/Goals
The purpose of this experiment was to discover which angle of the blades of a windmill would make the windmill spin faster and produce more energy. My hypothesis stated that the blades at a 15 degree angle would spin faster and produce more energy than blades at other angles.

Methods/Materials
The first order of business in this project was to build the windmill and four sets of blades at angles of 15, 30, 45 and 60 degrees. After the structure was built, it was testing time. To do this, a vacuum put into reverse was placed two feet in front of the windmill. The vacuum was turned on for ten seconds, the blades started to turn, and the volts were measured on a multi-meter attached to the windmill. This was repeated for each set of blades. I tested each blade twice to get a more accurate result.

Results
When the test runs were complete, the hypothesis was correct. The blades at a 15 degree angle spun faster and produced more energy than blades at 30, 45 and 60 degree angles.

Conclusions/Discussion
My conclusion is that in order to create more energy when using windmills, the blades should be placed at 15 degree angles. This gives the air coming at the windmill a bigger target to hit, thereby making the blades spin faster and producing more energy.

Summary Statement
In this project, I measured the energy output of a windmill with blades at 15, 30, 45 and 60 degree angles to determine which angle produced the most energy.

Help Received
Father helped with building the windmill structure and blades; Mother helped with the tri-board and editing the written report; and my Aunt helped with the computer-generated chart.