Name(s)

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Project Number

J0117

Project Title

I'm a Big Fan: Determining What Shaped Blades Most Effectively Generate Power in Wind Turbines

Abstract

Objectives

In this project the goal was to find which of three rotor designs on a windmill worked the best and spun fastest. Faster spin means more rotations per minute to create energy more effectively. The hypothesis was that the rectangular rotor blade which has the most surface area would work the best.

Methods

In this experiment a small-scale model of a wind turbine was built of, with three different rotors to test on it to find which one went fastest.

Results

Wind was simulated at a constant speed and the approximate number of turns per minute calculated per rotor type to determine effectiveness of the blade design. Repeated trials showed that the triangular blades consistently had the highest rotations per minute.

Conclusions

At the control wind speed of 7.5 miles per hour triangular rotor blades are more effective at generating spin than curved or rectangular blades.

Summary Statement

The experiment determined which of three differently shaped pairs of blades result in fastest spin to generate power most efficiently on wind turbines.

Help Received

I built, and preformed the experiments myself based on research I had conducted online. The design was modified from one I adapted off of the website sciencebuddies.com. I was supervised and instructed by my grandmother in the use of power tools.