CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

Tristen M. Snyder

Project Number

34811

Project Title

Towers of Power

Abstract

Objectives/Goals

The objective is to determine which type of wind turbine, horizontal-axis or vertical axis, produces more power.

Methods/Materials

Two mini wind turbines were constructed using a PVC base and a 7.4V motor. The first turbine used a vertical-axis blade made of a 32 fl. oz. plastic bottle and the second used a horizontal-axis blade made of a 10 x 7 in. three blade propeller. Each turbine was separately tested for power output using a volt meter while running a box fan one foot away from the turbine base, set at the same speed. Ten VDC readings were taken on each turbine.

Results

The horizontal-axis turbine produced an average of 2.30 VDC and the blades functioned better with the wind. When testing the vertical-axis turbine I found that the wind would often hit both sides of the blade and cancel itself out. The vertical-axis method produced an average of 0.60 VDC.

Conclusions/Discussion

My conclusion is that the horizontal-axis wind turbine operated better in the wind and produced more power while a vertical-axis wind turbine was found to have more difficulty using the wind to turn the blade and it produced less power.

Summary Statement

My project will help me understand the power generation difference between horizontal-axis and vertical-axis wind turbines to understand why the horizontal-axis method is more commonly used.

Help Received

My father showed me how to safely use the tools to build my project and supervised the process. He drilled out a section of the PVC to fit the motor and connected the wires to the motor.