Name(s)	Project Number
Saya Coronado	**J0105**

Project Title

Sustainability with Wind Power

Abstract

Objectives/Goals

I tested a model of a horizontal-axis wind turbine and models of vertical-axis Savonius,Darrieus,and Giromill wind turbines to see which device rotates faster to collect more electricity.

Methods/Materials

4 turbine models, 1 fan, 1 rpm measurer, 2 metal secures (for securing pipes, etc.), 1 shoebox cover with a hole (the size and shape of the metal secures) in the center, 1 camera.

1.After I constructed all four models, I put the Savonius model#s dowel into the metal secures, which is in the hole at the center of the shoebox, acting as the base.2.Place the base in front of the fan and secure the small rpm magnet at the tip of one of each of the model#s blades.3.Attach the sensor, so it could stand parallel and close enough to each device to register each time the magnet completes a revolution.4.Turn on the rpm measuring device.5.Turn on the fan at high speed.6.Stop the fan after one minute and record the data.7.Repeat this routine two more times, for a total of three trials per model.8.Repeat this procedure with the Darrieus, Giromill, and Wind Turbine models.9.Record observations and take pictures.

Results

I tested my four variables,models of the horizontal-axis,Savonius,Darrieus,and Giromill wind turbines.I used a fan to simulate the wind while the model,supported by a metal base,would spin around for one minute as the rpm was calculated.My results stated that the horizontal-axis wind turbine had the most rpm,followed by the Savonius,Giromill,and lastly Darrieus.My ending results differed from my hypothesis because my hypothesis was that the Darrieus would do better than the Giromill,and the Savonius would do the worst.I had to make a lot of changes not in the experiment itself,but when I was constructing my models.

Conclusions/Discussion

The results I obtained from my experiment showed that the horizontal-axis turbine is the most efficient of the turbines,while the Savonius scored better than the Giromill and Darrieus in my experiment.My empirical results were different from my expectations.This experiment taught me greatly about the different types of wind turbines there are and which are more efficient in producing electricity.In addition,it was definitely a good experience because it taught me to be creative in designing my models and the different materials I was going to use.

Summary Statement

I built models of four different types of wind turbines in an effort to find out which design would be the most efficient in producing electricity.

Help Received

Father took me to get my materials.