



CALIFORNIA STATE SCIENCE FAIR 2008 PROJECT SUMMARY

Name(s) Jarrold P. Wilbur	Project Number S0233
Project Title Wind Power	
Abstract Objectives/Goals The purpose of the report is to find the best combination of blade length, number of blades, and angles of the blades needed to create the optimal fan settings to produce the maximum voltage while using an electric generator. Methods/Materials First, I needed to find my variables. I decided to find the best length, number, and angle for blades on a windmill. I decided to make the body out of PVC piping, the blades out of Balsa wood, and I received my hub and generator from an online windmill source called http://www.kidwind.org/ . The wire was connected to a voltage test meter with a digital screen to give specific measurements. The balsa wood fins were eighteen inch long fins. I then used dowels that would attach to the fins so they could fit into the hub. The hub attached to the generator so that it could generate the voltage. I then started my testing. I joined the wires that were connected to the generator to the voltage indicator. To make my wind go at a constant speed, I used a heavy duty house fan. I then made a chart that would be easy to write down the results of my tests. In order to ensure my variables were tested correctly, I did each measurement eight times to keep the tests constant. The next step was to test my windmill in order to receive my results. I waited until the numbers reached their plateau, wrote the result, and turned off the fan. I then turned the fan back on and repeated the steps until I completed all eight tests. I then moved or cut the fans in order to make the new tests. Results In this project, I tested three different factors that affect power output in a small scaled windmill: blade length, number of blades, and angle of the blades. After testing all of the variables, I conclude that the combination of three six inch blades with at 24° angle gave the best peak of energy. Conclusions/Discussion I found that according to my tests six blades, not three, gave the most consistently efficient amount of energy during my tests. I also found that my two smaller angles, angles 12° and 24°, turned out much more energy then the high 36° angle. The final conclusion I found in this project was that my shortest blade, the six inch one made the most amount of energy then the other longer blades, the twelve and eighteen inch blades. I conclude from this that since the longer blades have more mass, they create more drag and therefore, less energy output.	
Summary Statement To get the best voltage from the blade length, number of blades, and angle of the blades on a horizontal wind turbine.	
Help Received Dad helped with buying material. Dad helped take pictures.	