



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Thomas C. Judge	Project Number J0110
Project Title Testing Turbines for Maximum Power	
Objectives/Goals The objective is to compare different styles of wind turbine propellers to see if the style of the propeller effects the amount of energy it produces. My hypothesis was that the style of the turbine does effect the amount of energy produced.	
Abstract Methods/Materials I designed four different styles of propellers to test. Turbine #1 was a two-blade model with straight blades attached at 80 degree angles. Turbine #2 was a four-blade model with straight blades attached at 80 degree angles. Turbine #3 was a two-blade model with the blades slightly bent in the middle of each blade. Turbine #4 was a four-blade model with straight blades that were angled forward from the hub. All turbines were made from balsa wood and attached to their own DC motor with leads. Each turbine was placed in front of a household fan. At the fan's highest setting for one minute, the wind generated registered an average of 3.0 meters per second (M/S) on my anemometer. Each turbine was mounted to the tower I built out of K#nex. The turbines leads were connected to the resistor on the voltmeter. Each propeller was tested ten times for one minute. I recorded the highest reading on the voltmeter for each test in my logbook.	
Results I calculated the average volts for each turbine by adding the ten test results and then dividing that sum by ten. Turbine #4, with the four, straight blades that were angled forward from the hub produced the highest voltage at 12.0 volts. Turbine #3, with two-blades slightly bent in the middle of each blade produced 9.8 volts. Turbine #1 with the two, straight blades attached at 80 degree angles produced 8.0 volts. Turbine #2 with the four-blades attached at 80 degree angles produced the lowest voltage at 6.45 volts.	
Conclusions/Discussion My hypothesis was correct. The style of the turbine does effect the amount of energy produced. The use of wind could be our answer for a future energy source. We need to find the best turbine design for maximum power. Wind energy doesn#t pollute and it is renewable, unlike the fossil fuels we use today. If I were to do this experiment again, I would create and test more turbines to further my search for the turbine that produces maximum power.	
Summary Statement My project is about comparing four different styles of propellers for a wind turbine to see if one style would produce more volts of electricity than another.	
Help Received For my project, my father helped me build the tower and my mother helped me type the report.	