



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Jonathan B. Yang	Project Number S0235
Project Title Efficiency from a New Wind Turbine Design	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I believe that propelling relatively low wind speeds through a wind tunnel to test different self designed wind turbines that vary in blade angle and length can produce a power output (watts) in a reversed current generator as measured by a volt amp meter.</p> <p>Methods/Materials Essential materials needed were cardboard, note cards, playing cards, fan, volt amp meter, and a DC Motor. My turbines were constructed in an upright vertical position with a 360 degree spin, allowing it to capture wind from any direction. Propellers were constructed of note cards, playing cards, and other useful materials founded around the house. By building a wind tunnel I was able to concentrate the air flow of the fan into speeds of 5 mph, 7mph, and 8 mph. However, I was able to calibrate the air speeds buy building an anemometer using a block of wood, a single nail, and a sheet of copper. By driving it through a car at intervals of 5mph and stopping at 20mph, I marked the angular displacement of the copper sheet. I used this as a reference to calibrate the air speeds of the wind tunnel. Using a volt amp meter connected to the DC motor, I was able to measure the appropriate amps and volts given off each wind turbine. With both the amps and volts I simply calculated the power output (watts) using $P=IV$.</p> <p>Results At the present I have constructed three different wind turbines. Out of these three I was able to observe which was the most efficient. The power output of wind turbine #2, the most efficient turbine, measured at .003 watts at 5mph, .01 watts at 7mph, and .02088 watts at 8 mph. However I do wish to construct more wind turbines so my results will vary in time.</p> <p>Conclusions/Discussion I was able to support my hypothesis by producing a power output (watts) using my vertical wind turbines. As my results pointed out, out of the three turbines that I had constructed wind turbine #2 proved to be most efficient out of the three. I wish to further my research by testing on similar designs. If built on a bigger scale, models like these may end up being more efficient than traditional wind turbines. By their sleeker design and efficient method of capturing wind, it could be built within urbanized areas as well as individual homes. This will reduce our dependence for extensive wind farms and promote the construction of urbanized wind turbines.</p>	
Summary Statement Optimizing the wind through a vertical based wind turbine.	
Help Received Brother helped build wind tunnel; Found DC Motor in the classroom with permission of science instructor; Mother helped drive the car to calibrate wind speeds	