



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Emily M. Johnson	Project Number J0110
Project Title Windmill Blade Shapes	
Abstract Objectives/Goals My project was used to determine whether the blade shape of a windmill would affect how much electricity it generated. Methods/Materials I used a model of a windmill, composed of PVC pipe, balsa wood blade shapes, a motor, a hole crimping hub to hold the blades, wires with alligator clips on the ends, and a multimeter. I put a fan two feet away from the model of a windmill and turned it on high. This was held for one minute. Then the fan was turned off. I did this process twice, once with the multimeter set to milliamps, the other time with the multimeter set to volts. I then did this process for all four of my blade shapes. I had to convert the milliamps to amps so I could put it in the equation $\text{Volts} \times \text{Amps} = \text{Watts}$ in order to find how many watts were generated per blade shape. Results My results show that the rectangle blade shape generated the most electricity followed by the oval (flat bottom) blade shape, then the rectangle (rounded corners) blade shape, and lastly the oval (flat top and bottom) blade shape. Conclusions/Discussion In conclusion, my results do support my hypothesis in that the rectangle blade shape generated the most electricity. My project also shows that the surface area, shape, and amount of drag affect how much electricity was generated.	
Summary Statement My project is about how windmills are a good source of energy and that how they are built with blade shapes affects how much electricity they generate.	
Help Received My mother and father checked over my report, gave me financial support, and gave me moral support. Also, my teacher Ms. Elliott gave me advice and guidelines to follow for my project.	