



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

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| Name(s) Kevin Lee; Spencer McManus | Project Number J0114 |
| Project Title Which Type of Wind Turbine Is More Efficient and Useful? | |
| Abstract Objectives/Goals Our question was "Which type of wind turbine is more efficient and useful?" Our purpose for performing this experiment was to determine whether it is more efficient to use Horizontal Axis wind turbines or Vertical Axis wind turbines. Methods/Materials First, in order to test our hypothesis, we constructed a Vertical Axis wind turbine and a Horizontal Axis wind turbine from mainly wood and foam board. We also used electrical wire and magnets to produce electricity. When the wind turned the turbine, the magnet rotor rotated over the coils of electrical wire, producing electricity. We conducted the tests at three different wind levels, with 30 trials at each level, in order to get more conclusive results. Results The average amount of electricity produced for the Horizontal Axis turbine was 1.85 DCV at low, 1.17 DCV at medium wind, and .92 DCV at high wind. The Vertical Axis turbine produced 2.76 DCV at low, 2.18 DCV at medium, and 1.14 DCV at high. Conclusions/Discussion Our hypothesis was not supported by our data. The Vertical Axis wind turbine consistently outperformed our Horizontal Axis wind turbine. We also noticed that as the wind speed increased, the amount of electricity produced decreased. This could be attributed to the way we generated our electricity, since we used magnets and wire instead of a generator. Another problem we had was measuring in alternating current. We tried, but obtained no readings from the multi-meter. This could have been caused, again, by the absence of a generator and the home-made quality of the turbines. If we were to perform this experiment again, we would probably use a generator to generate electricity instead of the magnets, as this might have caused some of the problems we were having. We could conduct further research into wind, alternative energy, and other types of turbines to extend our experiment. | |
| Summary Statement We tested two types of wind turbines to determine which of the two models produced more electricity. | |
| Help Received Dawn O'Connor for equipment and information. | |