



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Tim Castiglione; Michael White</b>	<b>Project Number</b> <b>J0906</b>
<b>Project Title</b> <b>Water with a Zap!</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Purpose Our project was to determine if the output voltage of our homemade hydro-electric generator will change linearly, exponentially or not at all when you increase the household water pressure. Hypothesis We believe the output voltage will increase linearly if the turbine and the generator are synchronized and spinning together.</p> <p><b>Methods/Materials</b> We built a homemade turbine and coupler with a 50 Pack &amp; 25 Pack CD cases. Each case had CDs spaced with 8 neodymium magnets. We built a homemade generator using a small cardboard box with a nail through the center of box and attached four ceramic magnets on the nail. We wrapped thirty gauge coated wire around the box 300 times to create our coil. Procedure We used the following steps to complete our project; 1.Hot glued the magnetic coupler to the turbine 2.Placed the sharp end of the nail from the generator into the shaft of the coupler using a carburetor vacuum plug. 3.Placed the completed hydro-electric generator in the plywood stand to keep secure while testing. 4.Turbine was connected to our water supply using an outdoor water valve and 3 foot hose. 5.Connected the volt meter using alligator clips to the two ends of coated wire on the generator 6.Performed five 30 second test at 10 different pressure set points. Each pressure set point was in increments of 5 PSI to a maximum of 50 PSI. The voltage output was measured using a calibrated volt meter for each test and recorded.</p> <p><b>Results</b> After averaging all the test data and plotting on our graph, we found that the output voltage increased exponentially as the water pressure increased.</p> <p><b>Conclusions/Discussion</b> Our test results proved that our hypothesis was incorrect. We would like to retest this project with a few improvements for next year. If we used unlimited water pressure, larger turbine, and a higher capacity generator would the voltage continue to increase indefinitely?</p>	
<b>Summary Statement</b> Our science project is about using household water pressure and building a homemade hydro-electric generator to test the effects of water pressure to generate voltage.	
<b>Help Received</b> Mr. White used the air dremel tool to bevel the PVC inlet pipe. Mr. Castiglione used the chop saw and scroll saw for the wood stand. Mr. Castiglione completed the on-line application.	