



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Muzammil A. Khan	Project Number J0113
Project Title SPLASH! The Effect of Size of Blades and Number of Blades on the Voltage Output of Waterwheels	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project is to investigate to see if the size of blades and number of blades affect the voltage output of a water wheel. Based on my research, the hypothesis I formed is by increasing the number of blades up to a certain point and increasing the size of blades up to a certain point will increase the voltage output of a waterwheel.</p> <p>Methods/Materials First I built the waterwheel stand (part with the generator). Then I constructed six waterwheels. Three were for testing the effect of blade size on voltage and the other three the effect of number of blades on voltage output. Three wheels had different sizes of blades (7.5cm, 15cm, and 22.5cm). The other three wheels had different number of blades (8 blades, 12 blades, and 16 blades). I connected these wheels to the stand and after attaching the voltmeter ran each of them under water for 30 seconds. I watched the reading of the voltmeter and recorded the highest voltage that I saw. I then repeated this 4 times for each wheel.</p> <p>Results The results for the (blade size) were that the 7.5cm blade waterwheel produced an average of 2.0mV. The 15cm blade waterwheel produced an average of 4.6mV. The 22.5cm blade waterwheel produced an average of 7.5mV. The results for the (number of blades) were that the 8 blade waterwheel produced an average of 3.8mV. The 12 blade waterwheel produced an average of 4.7mV. The 16 blade waterwheel produced an average of 6.5mV.</p> <p>Conclusions/Discussion My hypotheses of the waterwheel producing more voltage when there are more blades up to a certain point and of the waterwheel producing more voltage when the blades are bigger up to a certain point were supported. The reason for the waterwheel producing more voltage than the wheels with fewer blades is that when it had fewer blades the water strikes each blade and between each strike is a delay. This delay allows the wheel to slow down so less voltage is produced. But when there were more blades there is less time between each strike so less speed was lost. Since less speed was lost the waterwheel could produce more energy as the magnet turned faster moving the electrons faster producing more energy. The longer blades had more torque and therefore the waterwheel produced more voltage. With this information waterwheels can be constructed to produce energy more efficiently and by doing this we are a step closer from getting away from our dependency on oil.</p>	
Summary Statement My project is about investigating the effect of blade size and number of blades on the voltage output of a water wheel.	
Help Received My mother checked board for errors, judge from school science fair helped correct errors, my father helped in assembly of water wheels (cutting and super gluing) and revised documents for errors, and my teacher gave advice.	