



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Lam L. Nguyen	Project Number J0919
Project Title Down to the Wire: A Study of How Various Types of Wire Affect the Alternating Current Produced in a Generator	
Abstract Objectives/Goals My goal was to find which type of wire would work best in an alternating current generator. Methods/Materials I used 3 different types of wire at 3 different lengths with 5 trials each. The generator was run and the voltage generated was measured with a multimeter. Results The Litz wire yielded the best average voltages, but was almost the same as the twisted multi-stranded wire at 10 feet of wire (low coil numbers). Single stranded had similar data to the twisted multi-stranded wire at higher lengths (high coil numbers) but was worse at lower lengths (coil numbers). Conclusions/Discussion The results of my data were, for the most part, supportive of my hypothesis. The data collected proved my predictions correct. With the Litz wire, the generated voltage was clearly higher. I conclude that litz wire is proficient at dealing with the skin and proximity effects mentioned in my research and outshone the other two wires. The multi-stranded wire scored the second highest voltage for low length (low coil numbers). The single stranded wire was equivalent to the multi-stranded wire for higher length (larger coil numbers). The difference with the lower coiling for the multi-stranded wire and the single stranded wire was negligible. I believe that because the wires' only differences were the number of strands and the strands were neither insulated from each other nor twisted, they effectively acted as a single strand of wire, thereby removing any possible negative or positive effects of using multiple strands of wire except for ease of manufacturing. Despite the two similar wires, the goal of the experiment was achieved, and that was to find which wire produced the best voltages in an alternating current generator at various feet of coiled wire. If I were to expand upon this experiment, I would increase the types of wire, perhaps by gauge, increase the numbers of coiling in order to get a better comparison for different wires at different feet of coiling, and simply do more tests. Different types of wire may provide a substitute for Litz wire or even be better for AC power generation. Different gauges may change ohms and thereby increase or decrease voltage.	
Summary Statement My project was a study of how various types of wire used in an alternating current generator affect the alternating current produced.	
Help Received Family gave support; teacher gave ideas.	