



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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Project Title Enabler: Power Generation Re-Imagined	
<p style="text-align: center;">Abstract</p> <p>Objectives As per the 2010 Census, there are more than 55 million people in the United States that are disabled. Out of which 3.6 million people use a wheelchair to assist with mobility. One of the common problems people who use wheelchairs face is that they run out of power on the wheelchair when they use their wheelchair device charging station for charging their electronic devices. This becomes an issue if they happen to visit hospitals or places where they have to wait for a long time, or if they have to travel and realize that they didn't charge their device before departure. Enabler solves this problem for people with disabilities who use wheelchairs for charging their electronic devices on the go without depleting the power in their built-in wheelchair charging station. My hypothesis is to determine that electricity can be generated by using a piezoelectric module attached to a wheelchair through the spins of the wheel to power the portable devices of a wheelchair user while they are in motion.</p> <p>Methods The materials I used are - Piezoelectric Module, LED, Switch, Rechargeable Battery, Diodes, Wooden Wheelchair Model, and a Multimeter. For my model, I used a piezoelectric module and connected that to a couple of diodes. After that I attached a LED to the circuit to see if the electricity would flow through the circuit. It successfully lit the LED. Next, I removed a wheel from an old bike and attached pieces of plastic to the spokes of the wheel. I tried a variation of objects to use in place of the plastic but they all never actually powered the LED so this was one of my only options! Lastly, I put the piezoelectric piece in the way of the plastic so that whenever it touches the piezoelectric piece it will generate electricity. The factors that I considered for my hypothesis were the number of Piezoelectric modules and the volts generated. I tested my model 5 times and all of the 5 trials were successful. However I had to redesign my circuit around 3-4 times because it wasn't letting the electricity to flow through the circuit. The issue was either due to short circuited components or the Diodes had come apart from the leads. Often times the LED kept fusing. I used a multimeter to measure the volts because that is one of the most common form of measuring electricity. This electricity can be used for a variety of purposes from using it to charge electronic devices to powering the wheel chair as a whole in the future!</p> <p>Results The independent variable that I used in this project is the number of Piezoelectric modules and the dependent variable is the number of volts generated. The trials were conducted to determine how many spins the model could generate in 60 seconds. The model generated 17 spins in 60 seconds. So with one</p>	
Summary Statement I showed that electricity can be generated by using a piezoelectric module attached to the wheels of the wheelchair to power their portable gadgets while the wheelchair is in motion.	
Help Received None, I made and tested the project myself. I got inspired by a friend on a wheelchair at a disability event.	