



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Jacob Passalaqua; Matthew Prata	Project Number J0216
Project Title Just Charge It: Thermoelectric Generator Gear for the Active Person (Charge Small Electronics Using Your Own Body Heat)	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of our project is to create a thermoelectric generator vest which can charge small electronic devices such as a cell phone based on the Seebeck Effect.</p> <p>Methods/Materials 11 Peltier Tiles 11 Heat Sinks Insulated wire Transistor 1K Ohms Resistor Toroid LEDs Window Screen Old Shirt for vest Infrared laser Thermometer Cell Phone & Charger Cable Multi Meter</p> <p>Results Our goal was to generate 4 volts with our TEG with as little as a 30 degree temperature difference between body heat and ambient temperature. At first our TEG only produced .7 volts so we looked into making it more efficient and came across a simple devise called the Joule Thief, which is a voltage booster. We built our own Joule Thief and added it to our TEG. We were able to then generator enough electricity to light up a 2 volt LED.</p> <p>Conclusions/Discussion Our experiment proved to be correct. By using Peltier tiles, we were able to create a thermoelectric generator based on the Seebeck effect. We were able to charge our cell phone, light up our display board and run a clock all at the same time with our TEG but only when we created a large artificial temperature difference by using a hot plate and room temperature. However, by adding 1 homemade Joule Thief to our TEG, we were able to generate 3 times the voltage thus generating 2 volts with just using simulated body heat. With this major break through, we believe that by adding a Joule Thief to each Peltier circuit on the TEG we should be able to generate enough volts to charge our smart phone.</p>	
Summary Statement Based on the Seebeck Effect, we built a thermoelectric vest that produces electricity powered by body heat to generate enough volts to charge a small electronic device.	
Help Received My Mother, Christine Prata, helped sew the window screen to the shirt. She also helped us solder wires together and for safety she observed us during our experiments.	