

Miles Johnston

*Don't Let Charging Up Run You Down: A Study on Portable Power*

My project, "Don't Let Charging Up Run You Down: A Study on Portable Power," was based on the idea that people need a way to generate power when they are in places where they can't just "plug in." If we could harness the power created by natural human motions, we could have a convenient power source anywhere. I created my prototype from a shakable wilderness flashlight that I modified by removing the casing and light so that I could attach wires to the prongs on the circuit board that previously fed power to the light bulb. The power is generated by shaking movements, which move magnets inside the flashlight tube, and the changes in the magnetic field then move electrons through the copper wire. I tested comfort during exercise by strapping the prototype to my arm, similar to the way people use an armband for their phones. I tested to see if the device's electricity generating parts would function during exercise, then measured maximum outputs by attaching the charged (post-exercise) prototype to an amp meter and a voltmeter for one hundred seconds, and analyzed the resulting data. The prototype did meet the design criteria. In future prototypes, I intend on improving my design by adding a more convenient way to not just generate power, but actually charge devices, and an easier way to make more power with less work.