



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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Project Title Piezo Pedo Power Generator																	
<div style="text-align: center;">Abstract</div> <p>Objectives/Goals Piezometric materials can convert mechanical energy to electrical energy. Every human being walks about 10,000 steps a day and all the force generated by the footsteps is going waste, we would like to harness that energy by using Piezoelectric transducers. Therefore, we designed a foot mat using Piezoelectric transducers. Our foot mat is ideal to be used in remote places where electricity is not available or in situations like natural disasters to produce enough electricity to light a bulb or charge a phone.</p> <p>Methods/Materials Materials Breadboard, Jumper Wires , Soldering Iron ,Hot Glue gun ,Piezoelectric Tiles (x16),Copper Wires, wood board, Diodes, LED Bulb, Erasers, Switch, Voltmeter, Battery holder, battery. Methods: For the foot mat, we used two wood boards. We connected 16 Piezo transducers in parallel circuit by using a breadboard. We went for parallel circuit to get more current and built a bridge rectifier to convert AC to DC. Then we soldered the circuit on one wood board. Once the 1st board got ready with the necessary circuit, we placed the 2nd board on top of it. Then we asked six individuals of different weights to walk on the mat one after another. Their pressure on the Piezo tiles generated electricity that we captured using a voltmeter. To harness the maximum force generated by walking, we put erasers as cushion between transducers boards. When enough voltage was produced, the LED light we had connected to the circuit did light up.</p> <p>Results We picked six people with different weights and asked them to step on the model. Each of them had to walk on the mat so that he/she could create pressure on the piezo tiles with their steps. The pressure from the foot steps generated electricity that we measured using a voltmeter. We gathered the data in 2 different trials for each individual.</p> <p>Below is the snippet of data we collected:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Weights(Lbs)</th> <th style="text-align: left;">Trial1 (Volt)</th> <th style="text-align: left;">Trial2 (Volt)</th> <th style="text-align: left;">Average(Volt)</th> </tr> </thead> <tbody> <tr> <td>55</td> <td>26.2</td> <td>35</td> <td>30.6</td> </tr> <tr> <td>72</td> <td>63</td> <td>94</td> <td>78.5</td> </tr> <tr> <td>90</td> <td>80</td> <td>108</td> <td>94</td> </tr> </tbody> </table>		Weights(Lbs)	Trial1 (Volt)	Trial2 (Volt)	Average(Volt)	55	26.2	35	30.6	72	63	94	78.5	90	80	108	94
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Summary Statement Our Piezo foot mat generates clean renewable energy that can be used to charge batteries or light LED bulb.																	
Help Received Our parents helped us with soldering the circuit design.																	