



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

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Project Title Making a Change for People Who Can't Afford Electricity	
<p style="text-align: center;">Abstract</p> <p>Objectives We learned from research that wind turbines have different blade types and our objective was to determine the type of wind turbine that produces the most energy: 2-blade, or 3-blade.</p> <p>Methods Using some of our toys, Legos and a Circuit Cube motor, we built a mini-wind turbine that could generate electricity and make light.</p> <p>We built two model turbines, 2-blade and 3-blade, to see what blade would make the most energy. We used our Legos and Circuit Cubes to build the turbine base, and we 3-D printed blades to attach to the windmills. The blades were the same length and width. The only difference was the number of blades. [We ended up using all Lego parts because we were worried our 3-D printed blades would break apart.]</p> <p>Next we connected alligator clips to the Circuit Cube and to a voltmeter to determine the volts produced by the blade types.</p> <p>Then we generated wind with a leaf blower! We aimed the blower at each of the turbines (3-blade and 2-blade), at the same wind speed for the same time period, and measured the volts. We repeated this three times.</p> <p>Results The 3-blade mini-turbine generated the much more energy when compared to the 2-blade turbine. The average volts generated by the 3-blade turbine was 2.31 volts; the average generated by the 2-blade turbine was 1.63 volts.</p> <p>Conclusions Our hypothesis that the 3-blade wind turbine would make more energy than the 2-blade wind turbine was correct. We believe this is because the 3-blade propeller has more surface and angles to catch the wind so it spins faster and produces more electricity.</p>	
Summary Statement We showed how wind turbines generate electricity and that a 3-blade turbine generates much more energy than a 2-blade model.	
Help Received We designed the project while building toy windmills. We got advice from the project sponsor on how to measure the electricity generated when the turbines spin, and Owen's father's business donated use of its 3-D printer for making our blades.	