



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Minjong Kim; William McGrath	Project Number S0907
Project Title A New Sustainable Energy: Microbial Fuel Cell	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The United States produces approximately 236 million tons of waste annually. The purpose of this experiment is to build and test a microbial fuel cell (MFC). To prove that it is an alternative method for creating electricity and avoiding depleting our natural resources.</p> <p>Methods/Materials Three microbial fuel cells were built and tested using organic waste matter as fuel that converts chemical energy to electrical energy by the catalytic reaction of microorganisms. Five trials were conducted. Voltage output was tested twice a day, once in the morning and once in the late afternoon for a period of 30 days and 20 for trials 4 and 5 (because of the lack of time).</p> <p>Results Each trial showed a reoccurring pattern. In the morning our data points were each very low, but by the late afternoon our data rose in voltage, significantly, and then proceed to decrease late at night. By the 10th day each trial fuel cell reached its panicle voltage output. Trails 4 and 5 showed the highest level of voltage output.</p> <p>Conclusions/Discussion In conclusion our hypothesis was validated. The fuel cells did overall increase the voltage output simply through bacteria production. Fuel cells, even on a miniature level, do prove to supply and produce energy needed to power or even create safe drinking water. Once microbial fuel cells can be commercialized, they will revolutionize our power generating system as well as water cleaning system.</p>	
Summary Statement We created a microbial fuel cell which uses bacteria to create electricity and water.	
Help Received Dr. Gallo from UCSD provided supplies and advice for the project; William McGrath's mother and sister helped to create the board; Acquired mud samples from Tijuana Estuary Visitor Center.	