



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Andrew A. Fineman	Project Number J0913
Project Title Does an Electrolyzer and Fuel Cell, in Circuit, Provide More Energy Than One Reversible Cell over Time?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The experiment purpose was to find out if a Reversible Fuel Cell provided more power than a Fuel Cell over time. It was hypothesized that the RFC and FC would produce about the same amount of power because the hydrogen cell was the same.</p> <p>Methods/Materials 14 trials were conducted on each cell with the control being the Electrolyzer and Fuel Cell. Power output was measured in voltage and amperage. Remaining hydrogen was measured in cubic centimeters.</p> <p>Results The RFC resulted with the greatest power output over the Fuel Cell. The averages were (RFC/FC): 0.4837/0.2124 volts; and 0.4661/0.1502 amps. There was a 228 percent voltage difference, and a 310 percent amperage difference between the RFC and the FC.</p> <p>Conclusions/Discussion Of the hydrogen applications tested, the Reversible Fuel Cell provided more power over a period of time than the Fuel Cell. A fuel cell and an electrolyzer cell are the exact same thing; the only difference is the cells application. Electricity and water are run through an electrolyzer cell in which the hydrogen and oxygen in the water are separated. Hydrogen and oxygen are then run through the fuel cell and produce electricity, water, and a small amount of heat. A fuel cell can run forever if an unlimited supply of hydrogen were available, however, moisture build up in the cell stops the process. That is probably why the RFC worked better, because it could rid of all the moisture inside itself when run as an electrolyzer.</p>	
Summary Statement My project was to measure wether or not an Electrolyzer and fuel cell was more efficient than one reversible cell.	
Help Received Grandfather bought supplies.	