



**CALIFORNIA STATE SCIENCE FAIR  
2011 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ikeoluwa F. Adeyemi</b>	<b>Project Number</b> <b>J0201</b>
<b>Project Title</b> <b>There Once Was a Hydrogen Fuel Cell</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this project is to discover which form of oxygen a hydrogen fuel cell car would run more efficiently on- forced oxygen, forced air, or ambient air. I believe the car will run more efficiently on forced oxygen, which is 100% oxygen, while forced air and ambient air contain only 21% oxygen(19% at the least). <b>Methods/Materials</b> I used a fuel cell car to test how it ran on each oxygen source by changing a factor in the operation of the car depending on the source. I let the car run, while propped on blocks, and measured the voltage outputs every 10 seconds using a multi meter and stopwatch. <b>Results</b> The stopwatch showed that the car ran most efficiently on forced oxygen- it ran for more than 12 times the amount of time as forced and ambient air. On forced oxygen, the car ran for 434 seconds, but on forced air and ambient air, it ran for about 30 seconds. According to the multi meter, before stopping, the car was able to get down to a lower voltage on forced oxygen than on forced air or ambient. On forced oxygen, the fuel cell's voltage output got down to .039 before stopping. On forced air, it stopped at .077 volts, and on ambient air, it stopped at .053 volts. <b>Conclusions/Discussion</b> In the short run, forced oxygen allows the fuel cell car to operate more efficiently, but when an unlimited supply of oxygen is needed for a more powerful fuel cell, ambient air would be the best choice.	
<b>Summary Statement</b> My project shows which source of oxygen would be most effective when operating a Proton Exchange Membrane Fuel Cell- an alternate source of energy.	
<b>Help Received</b> I used lab equipment at Loma Vista Middle School under the supervision of Mr. Cooper, who provided help and advice throughout the process of project.	