

NHA NEWS



Students Help Build Hydrogen Fuel Cell Power System for an Ice Cream Maker

By Susan Tatsui-D'Arcy, Administrator, Merit Academy

Our primary goal at Merit Academy is to provide our academically accelerated students the opportunity to critically analyze the world around them and to give them the tools and guidance necessary to make a difference. Every year at Merit, the students unite to pursue one proactive project. After a debate session last year about our nation's precarious involvement in the Middle East, the students decided to find an alternative clean fuel for the world to end America's dependence on foreign sources of energy.

After much research, hydrogen was selected as the energy source of choice. Merit Academy then joined with the Schatz Energy Research Center at Humboldt State University (California, U.S.A.) to build a hydrogen fuel cell that will power an electric ice cream maker to demonstrate hydrogen fuel as an energy source. Merit's current mission is to get people to stop and think about their energy consumption choices.



Merit Academy students inspect the solar electric panels which power the electrolyzer which supplies the hydrogen for the fuel cell they're building with the help of Schatz.

With the careful guidance of the Schatz Energy Research Center, Merit Academy will be the first K-12 school to assemble a hydrogen fuel cell. Schatz has designed and engineered this hydrogen fuel cell for Merit Academy. The fuel cell demonstration will consist of a hydrogen delivery system, a 100-W fuel cell, an inverter, an air delivery system, and an ice cream maker.

Hydrogen will be delivered from a standard lecture bottle to the fuel cell, which will produce DC power. Using a small inverter, this power will be changed to AC power suitable for a standard electric ice cream maker. A precooled refrigerant gel within the walls of the ice cream container will absorb the heat of the ice cream ingredients. One lecture bottle will serve to produce three batches of ice cream.

Jaclyn D'Arcy, in the fourth grade at Merit Academy, says that they are planning for a cleaner planet. "The Merit Fourth graders are nine years old and by the time they are 90 years old they want the earth to be a clean environment to live in. They think that hydrogen energy will help them reach their goal."



Merit students toured the Schatz facility in November. In January 1999 they went to Schatz to help construct their fuel cell. The Schatz engineers will bring the completed fuel cell to Merit Academy in Santa Cruz County to conduct its first experiment in February 1999. The students will conduct a series of experiments and will get experience in taking data and calculating efficiency. They'll share their technology with local public and private schools and make their debut on local television shows.

This project will show students and teachers that the youth of America is interested in alternative energy sources. After we share our hydrogen curriculum with the public and private schools across the nation, other schools will be encouraged to offer hydrogen technology topics in their curricula.



Nicole D'Arcy, an 8th grader, says Merit Academy's mission is "to introduce hydrogen as an alternative fuel to other students by making them aware of alternative fuel sources." Using ice cream is a medium to attract students.

The National Hydrogen Association has invited Merit Academy students to exhibit the hydrogen fuel cell at its 10th Anniversary Celebration in April [1999]. National Public Radio has also approached Merit Academy to set up a radio interview with the students after they build the hydrogen fuel cell. These young, dynamic students can touch the hearts of the young and the old in a powerful way to show the nation why hydrogen will be one of our future energy sources.

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