As job growth in the green economy outpaces total job growth, schools are preparing students for a greener tomorrow.

Because we educators vicariously touch the future through our students, I believe that we sometimes have the uncanny ability to see the future. One common future forecast is the phenomenal growth of green jobs in the emerging green economy, leading to our creation of the “Reach for the Sun” Solar Energy Academy at La Mirada High School.

Manufacturing employment in California’s green economy expanded by 19 percent from 1995 to 2008, according to Reuters, while there was a 9 percent drop in total manufacturing employment over the same period. The engine driving this burgeoning growth of the green marketplace is fueled by research that describes formidable challenges for California and its economy. We need to help prepare our students for the seismic changes in society and our environment.

La Mirada High School, under the leadership of Principal Bill Seals and District Superintendent Ruth Perez, has a history of green grant awards. In 2004, I wrote the first grant application (a $10,000 award) to British Petroleum “A+ for Energy” funding. Realizing that the foreign language curriculum, which I teach, could not do justice to the breadth and scope of the renewable energy field, I invited science teachers to join the BP funded, “Wave of the Future” energy program.

A total of seven individual $10,000 grants, for a total of $70,000, were consequently awarded from 2004 to 2008 to La Mirada High’s initial energy program. Funds were used for classroom materials, solar technology, fieldtrips, conferences, literature and other student related expenses.

From the many students who participated in “Wave of the Future” energy program, several went on to environmental studies majors and internships in solar installation businesses.

Because our funding is so dependent on grant monies, we have begun to model grant

By Norma Velia Williamson
writing for students and direct them to grant opportunities. A couple years ago, I guided a student in the writing of a mini-grant to replace Styrofoam lunch trays at school with more eco-friendly bio-plastic trays made from corn starch. She won $500 to accomplish this goal!

In 2009, La Mirada High School was awarded a Green CPA (California Partnership Academy) three-year grant for a “Reach for the Sun, Solar Energy Academy.” For the first time in 2009, California Department of Education awarded up to $42,000 CPA grants to 42 high schools across the state to develop and implement green academies that focus on clean technology and energy businesses.

Alternative energy school within a school

The California Partnership Academies are small learning communities based on a “school within a school” model. Core classes revolve around a career tech program, in this case a newly developed Green Construction/Alternative Energy class in the school’s woodshop. As mandated by the state, 50 percent of academy students must meet the at-risk criteria of low motivation, low GPA, high absenteeism, and economically disadvantaged.

Students as well as teachers are required to volunteer to participate in the academy. Teacher-developed curriculum is integrated into main courses of study. Tenth-grade core academy classes are: language arts, world history, biology and green construction/alternative energy. Eleventh-grade classes are language arts, U.S. history and Spanish. Additional academy classes are algebra I and geometry. In spite of the normal “growing pains” of a second year program, we do have much to celebrate and to share!

Teachers receive in-service on implementing the Buck Institute approach to Project Based Learning. This instructional standards-based methodology empowers students as active learners, connects them to the real world of work and challenges them to solve authentic problems by conducting inquiry around a “driving question.”

For example, a current U.S. history four-week unit organized its inquiry-based learning around the driving question: “How does a residential building become a net zero energy home and how can these green homes attract a buyer’s market?” The “entry event,” which is intended to motivate and engage students’ curiosity, was a field trip to Traditions Heritage Springs, a new solar home development in Santa Fe Springs, Calif.

A representative from Sun Power (a solar company) personally introduced students to residential solar systems and the Far West Industries project superintendent described the energy efficient features of the homes. Students were amazed to hear that a recent electric bill of one of the solar homes was a grand total of 72 cents!

This U.S. history unit is integrated with language arts and foreign language. Students are challenged to “green” the nation’s first housing development for World War II veterans – Levittown, in Long Island – by simulating green energy upgrades through constructing table top shoebox solar homes with functional mini solar panels.

In U.S. history class, students learn about the green careers needed to renovate the old energy-wasteful veterans’ housing. Students also engage in a Green Energy Jobs Search classroom activity, as well as host special classroom speakers like Anna Bautista from GRID Alternatives, who is one of 10 female solar installers in the country.

A third fieldtrip will be to the Cal Poly Pomona Regenerative Center, a 16-acre community model dedicated to the principles of environmentally sustainable living with demonstrations of straw bale buildings, solar energy, water reclamation, water purification and organic gardening.

In the language arts classroom, students hear from a freelance writer about strategies for effective writing of promotional materials and create a sales brochure for the energy upgrades of a veterans’ housing development. A variety of rubrics will help assess the projects’ culminating products: the solar homes sales brochure, the solar homes shoebox models, the “Greening of WW II Veterans’ Housing” student-made PowerPoint presentations.

Community partners offer motivation

The CTE Green Construction/Alternative Energy class constructed wooden tabletop solar house models, which included blue jean insulation, mock dual pane windows and a fully functional solar panel that operates a miniature fan. Local solar homeowners will be invited to visit classrooms and give positive feedback to students’ PowerPoint presentations and products.

Eleventh-grade solar academy students were prepared for this U.S. history unit on net zero energy homes from their tenth-grade green curriculum research project in
language arts and biology. The project examined how global societies can reduce their carbon dioxide emissions.

In addition to the research paper and student-made scrapbooks on this carbon dioxide emissions instructional ecology unit, a culminating project for current tenth and eleventh graders will be “solarizing” a school service electric golf cart. Academy community partner Bob Siebert, founder of EE Solar, will guide students in installing solar panels on the golf cart’s roof canopy.

A school-wide event that complements this carbon dioxide unit is the yearly competition with a local “rival” high school, Norwalk High, in the sixth annual “Bike, Walk to School Day,” which recognizes the high school that reduces carbon dioxide emissions the most.

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Community partners of the solar academy exhibit their green information and older academy students display fun, interactive displays. Students visit each “booth” and take notes about the exhibits.

A sampling of our best practices

Green fundraisers, like Green Irene and Green Tree Footprints, not only help raise funds for fieldtrips, but are educational as well. The products are eco-friendly and promote environmental awareness, from energy-efficient light bulbs to recycled wrapping paper.

This year a Reforestation fundraiser complements the Amazon rainforest unit in our Spanish Two curriculum. We keep 66 percent of the profit, and proceeds go to replanting trees in National Forests. Our fundraiser will be sponsoring the reforesting of the Angeles National Forest that suffered from the burning of 166,000 acres in September 2009.

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