



## Shining a Light on Solar

### **NEXUS Solar Kits project illuminates solar energy concepts for both teachers and high school students**

While the sun shines almost daily in Nevada, many students don't appreciate the opportunity this abundant resource may offer them: both in terms of providing a sustainable energy supply and even a possible future career.

To enlighten Nevada students about the many benefits of living in the State, NEXUS researchers have designed a portable solar energy classroom kit, the Sol Traveler, which can be used to teach both engineering and solar energy concepts to high school students in Nevada. It is a fully functional solar thermal water heater kit that can be used for actual experiments in the classroom.

"The goal is to provide a resource for teachers," says Dr. Erica Marti, who coordinates several workforce development and education activities at the University of Nevada, Las Vegas, "so that they can engage and interest their students in both solar energy and engineering design."

### **Solar To Go**

Each solar classroom kit fits into a neat portable carrier that teachers can easily transport to their classrooms and into outdoor sunny areas. The kits contain photovoltaic panels and all the materials necessary to turn the Sun's energy into electricity that can power a pump to move water through a thermal panel for solar water heating. "We want the community to understand more about the advantages and limitations of solar energy and the different ways that solar energy works," Marti says.

Marti's initial emphasis is on training the teachers on the concepts of engineering design using the solar kit. Teachers then tailor the kit to their specific classroom needs. "Some teachers want it to do science experiments in order to gather data for students to analyze," Marti says. "Other teachers have designed the kits so they can have an engineering design experience for their students."

In attending the trainings, the teachers attain their own professional development goals in mastering the concepts of solar energy generation and engineering design. Using the basic principles of engineering design - *defining a problem, developing solutions and then optimizing a solution* - the teachers design and construct their own solar energy kit to meet the learning objectives they have for their students. The trainings might involve the teachers learning how to use power tools or performing soldering to create their specific kit.







The teachers then take the kits into the classrooms and use them to teach their students the basic principles of engineering design and solar energy concepts. “There is a lack of training right now for teaching engineering design,” Marti says. “So for teachers who want to bring an engineering design experience into their classrooms, this training fills a need.” Teachers receive graduate level credit for the training and also a stipend to participate.

Already, seven teachers have taken the kits into the classroom and Marti estimates 1000 students will have been reached by the end of the school year.

### **New Avenues to a Science or Engineering Career**

The feedback from the teachers who’ve used the kits so far has definitely been positive, Marti says. “They’ve been very pleased, both in terms of what they are learning, especially the engineering design, and then having something that is specific for their classroom because they designed it that way,” Marti says.

But in applying the principles of engineering design to the kits and training itself, Marti continues to work on improving how best to teach the solar energy concepts. “It’s important because if the teachers don’t really understand solar energy concepts, the children won’t understand them quite so well,” Marti says. “Likewise, if the teachers feel confident in teaching engineering design, the children will pick up on that.”

Marti’s ideal is that solar energy education becomes a component in every high school in Las Vegas and that each high school student gets to experience “real world” engineering challenges. “Right now, not that many students are exposed to these at an early age,” Marti says.

Marti hopes that these experiences will give the students an insight into careers in solar energy or engineering, making them interested in a future career in these fields. “I would like there to be a very easy or very visible pipeline for students who want to work in solar energy, so that they know what the field entails, how to get educated and how to get a job in the community where they grew up,” Marti says.

The solar kits may help some students find a fulfilling career, without having to leave the sunny state of Nevada, Marti hopes. “Some people think that if you’re going to get job as an engineer, you’ll have to move,” she says. “But in this case, Nevada is one of the top places where you could get a job in solar energy.”

*by Jane Palmer  
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