

FOCUS ON EDUCATION

FALL 2008

THE MIDDLE SCHOOL ISSUE

This edition of *Focus On Education* will highlight a few of Sandia's educational programs that have the ultimate goal of engaging, New Mexico's middle school students, and the training of middle school teachers.

While Sandia and numerous Sandian's are involved in education outreach at many different levels from elementary to college, middle school is vital since most experts agree that the education young adolescents experience during this formative period of life will in a large measure determine their future.



A participant in the Alternative Fuels Challenge prepares her team's car for the race.

The Alternative Fuels Challenge - The second annual Alternative Fuels Challenge for middle school students was held at the Albuquerque Public Schools (APS) City Center on April 19, 2008. Attended by 28 teams including one Carlsbad, New Mexico, this exciting competition consisted of four challenges; essay, oral presentation, original car design and race. While the first three challenges were optional, the overall grand prize was awarded to the team that did the best in all four of the individual competitions, and not necessarily the team with the fastest car.

Community Involvement (03652) has partnered with the Albuquerque Public Schools Energy S.T.A.R.S. Program, Los Alamos National Laboratory (LANL), and New Mexico's largest public utility, PNM to host this fun event. The Department of Energy (DOE) kindly provided the teacher and student fuel cell kits.

The Alternative Fuels Challenge provides an opportunity for middle schools teams, made up of two to six students, to learn and use science and engineering skills to face technical challenges comparable to those that scientists and engineers face every day. The Challenge was also created to help the students learn about the growing need for renewable energy sources and to give them a hands-on opportunity to explore the rapidly emerging alternative energy technology of hydrogen powered cars. As well, the essay and oral challenges recognize that engineers and scientists must also be able to accurately communicate their work and discoveries to others.



Sandia National Laboratories

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Citizen Schools - Founded in 1995, but new to Albuquerque, is a national organization that has created a network of after-school middle school programs that complements classroom learning by connecting adult volunteers with students in hands-on learning projects called apprenticeships. The adult volunteers and semester long apprenticeships are well supported by a professional staff of Citizen Schools educators.

Sandia's first involvement with Citizen Schools (www.citizenschools.org) was during the Spring 2008 semester at Albuquerque's Grant and Wilson Middle Schools. Sandia's apprenticeship, An Introduction to Engineering, was made up of nine individual modules that explored different areas of engineering, from computer to nuclear, and was taught by Sandia subject experts. As a treat, the apprenticeship also included a field trip to EXPLORA! Albuquerque's fun hands-on science museum.

For the Fall 2008 semester Sandia volunteers will be working with Citizen School and students at Grant and Wilson Middle Schools on building and programming a Lego robot to participate in the national First Lego League competition.

School to World (STW) - Celebrating its 10th Anniversary in 2009, STW is held annually at the Albuquerque Convention Center. School to World is New Mexico's biggest career exploration event, and is Community Involvement's largest program, both in the number of attendees and volunteers. At the March 10, 2008 event, some 550 volunteer presenters from over 150 different career fields ranging from an Attorney to a U.S. Air Force Weapons Specialist had the opportunity to talk with almost 2,100 eighth and ninth graders from 113 New Mexico schools.

By providing these students the opportunity to talk with so many professionals, School to World helps answer one age-old question of why "do I have to take algebra" and other seemingly unneeded classes and gives the students an idea of the courses they must take in high school and college to succeed in a particular career field. The 2009 STW (www.schooltoworld.org) will be on Saturday, March 14th at the same location. In addition to the 550 career presenters, numerous other volunteers and 24 corporate sponsors made the 2008 School to World a fun and free event.



Sandian Jake Duell explains robotics at School to World.

Hands-On / Minds-On Programs - Three programs are included: HM Tech targets African American middle and high school students; Dream Catcher Science Program focuses on Native American students; and Manos is designed for Hispanic middle school students from Rio Grande and West Mesa Clusters. These three programs were created to locally meet the nation's challenge of improving the teaching and learning of science.

HMTech (Hands-On, Minds-On Technologies) - Summer Science Program has been helping New Mexican African American middle and high school students for 22 years. This series of 4 free Saturday workshops is sponsored by the Black Outreach Committee Leadership and is held at Del Norte High School.

In 2008, seven fun and innovative classes encouraged the students to take a hands-on approach to learning science and engineering. Parents of the students are also encouraged to volunteer and actively assist the instructors in the classroom.

A primary goal of HMTech is to increase the number of African American students who pursue engineering and science degrees in college.

Dream Catcher Science Program - A hands-on science and engineering program designed for American Indian middle and high school students who are interested in science, math,

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and engineering. Like HMTech and Manos, it is a free Saturday program and parents are invited to participate in the workshops with their children.

Some comments on the innovative Dream Catcher Program by recent students include: I enjoyed learning about statistics using M&M candies; this program was fun, I had a blast: I enjoyed the hands-on experiments; and I'm glad I took the Engineering class. Comments from parents: The program was wonderful; My kid and I had a great time; I'm glad we had the opportunity to participate; We learned a lot and had fun at the same time.

Manos Hands-On Science and Engineering Program - An educational activity targeting Hispanic middle school students from the Rio Grande and West Mesa Clusters. Offered each spring, Manos is designed to introduce science, engineering, and math concepts to middle school students and spark their interest in pursuing careers in science and engineering.

Middle School Science Bowl - A priority program of the Department of Energy's (DOE) Office of Science (www.scied.science.doe.gov/nmsb/). Sandia's Community Involvement Department, the Community Programs Office of LANL, and the Albuquerque Academy. Numerous Academy and Sandia volunteers host our local Northern New Mexico Middle School Science Bowl at the Academy's Science Center. The 2009 Middle School Science Bowl is scheduled for Saturday, January 17, 2009.

In 2009, for the first time, the Middle School Regional winners will join the High School Regional winners at a combined DOE Nationals in Washington, D.C. (April 30 to May 5, 2009) on the attractive campus of the National 4-H Conference Center in Chevy Chase, Maryland. Approximately 40 Middle School Regional winners will compete for the National Championship and an assortment of trophies and prizes.

WHAT'S NEW?

Hispanic Youth Symposium - Held on the main campus of the University of New Mexico (UNM), July 9-12. The symposium is a program of the Hispanic College Fund. New Mexico MESA (Math Engineering Science Achievement) presented the NM program sponsors including SNL, Lockheed Martin, LANL, Wells Fargo, UNM, the National Nuclear Security Administration (NNSA), the

U.S. Department of Agriculture, and others who provided funding and volunteers to support this new event.

The goal of the four-day symposium, attended by some 70 Hispanic high school students from across the state, was to raise their college expectations by interaction with a range of adults from various career fields and by the awarding of college scholarships.

Every Child Ready to Read - Free one hour workshops, created by the American Library Association and presented at Sandia by staff of the Albuquerque/Bernalillo County Library System. The three workshops coordinated by Community Involvement are; Birth to Two, Two to Three, and Three to Five. All are designed to help the parents and caregivers of young children teach their children six important pre-reading skills.

System Thinking in Schools - Sandia and the Science Education Institute of the Southwest (SEIS) sponsored a Systems Thinking in Schools workshop for 16 teachers in July. Staff from the Arizona Center for Systems Thinking in Schools conducted the four day introductory workshop. Systems Thinking is a worldview, a perspective of seeing and understanding systems as wholes rather than a collection of parts. During the workshop the teachers experienced, practiced and discussed interactive inquiry based instructional and school improvement strategies.

OUR 2009 CALENDAR

- Middle School Science Bowl - January 17, 2009
- High School Science Bowl - February 28, 2009
- School to World - March 14, 2009
- New National Atomic Museum opens - March 2009
- Alternative Fuels Challenge - April 2009
- Daughters & Sons Day - April 23, 2009
- Pi Awards - May 6, 2009
- Thunderbird Awards - May 20, 2009

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VOLUNTEER SPOTLIGHT - SANDIAN MALYNDA CAPPELLE

When I was in first or second grade at Albuquerque's Wherry Elementary, I remember these weird guys coming to a school assembly to show us science. They froze tennis balls with liquid nitrogen and threw them against the wall, did fun chemistry making foam, color-changing mixtures, and pretty much got me excited about a possible future in science. Later, in middle school, I participated in the Science Olympiad in forensic science mysteries, land navigation, and other activities. Through the years, volunteers (and my teachers) were there to help me learn and to keep me on a path to a successful future in science.

These early memories are what keep me going in my various volunteer activities at Sandia and elsewhere. I started doing the Manos program as a helper in 2005, now I'm the lead chemistry coordinator at West Mesa High School. It can be difficult working with middle school students, but at the end of the 4-week Manos program, you can see that the students have learned that science can be fun.

Another favorite of mine is working with the Citizen School engineering apprenticeship program, which is a fast paced program to get middle schoolers interested in science and engineering. Other activities that I enjoy doing are judging science fairs and talking to elementary school students about water conservation. All of these activities allow me to engage young minds and to show them that they too can have a future in science or whatever they put their minds to.



Malynda Cappelle

Visit us at <http://www.sandia.gov/about/community/index.html> or call **(505) 284-5200** for more information.

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