



4-H Science, Engineering, and Technology E-News

August 2010

4-H science, engineering, and technology (SET) projects engage youth in hands-on, inquiry-based learning in a positive youth development context. Through participation, youth improve their science, engineering, and technology knowledge, skills and abilities. Through engagement in 4-H SET activities, youth apply SET learning to all areas of their life, adopting and using new methods of approaching problems. Ultimately, the goal of the 4-H SET initiative is to increase the number of youth pursuing education and careers in science, engineering and technology. More information about 4-H Science, Engineering, and Technology is available at <http://www.ca4h.org/Projects/SET/>

FEATURED NEWS

4-H National Headquarters has changed the name of the 4-H mission mandate "4-H Science, Engineering, and Technology (SET)" to "**4-H Science.**" USDA 4-H National Headquarters made this name change because of the establishment of the USDA National Institute of Food and Agriculture (NIFA), which is led by a chief scientist, and a movement for better integration of the three mission mandates: healthy living, citizenship, and science. In California, we are addressing this mission mandate and the need for increased science literacy with the **California 4-H Science, Engineering, and Technology Initiative.**

The executive summary of the **4-H Science, Engineering and Technology (SET) Initiative - Youth Engagement, Attitudes, and Knowledge Study (2010)** is now available. The report finds that most 4-H SET members surveyed for this evaluation are enthusiastic about SET, have SET skills, and many are interested in pursuing SET careers. More than 80 percent of respondents indicated that they intend to finish college or continue to get more education after college. Participant's favorite aspects of their programs are the relationships they form with adults and youth and the opportunities they have to do hands-on science activities. Read more at <http://www.ca4h.org/files/36940.pdf>

Update on Planning for the 2010 4-H National Youth Science Experiment

- The **2010 National Science Experiment, 4-H2O**, will focus on water quality and climate change. Using a three-tiered experiment model, the experiment engages youth of all ages to learn at the simplest level how carbon dioxide can affect aquatic animals, plants and other living organisms in lakes, streams, rivers and oceans. The activity guide is available at <https://www.4-h.org/NYSD/>
- Watch the **Experiment How-To Video**, sponsored by Toyota at <https://www.4-h.org/NYSD/how-to-video.php>
- **Experiment kits** for 4-H2O, the 2010 4-H National Science Experiment, are available for pre-order. The experiment kit has everything you'll need to complete the first two tiers of this year's experiment, providing enough materials for up to 15 youth. The kits cost \$22 on the

National 4-H Mall at <http://www.4-hmall.org/detail.aspx?ID=2314606>. Kits will ship on August 2.

- **Sixteen counties were awarded funds** to conduct a public 4-H National Youth Science Experiment in October: Humboldt, Imperial, Inyo-Mono, Marin, Merced, Riverside, San Bernardino, Los Angeles, San Diego, Siskiyou, Solano, Sonoma, Tuolumne, Ventura, and Yolo. Thank you to the sponsors: Toyota, The California 4-H Foundation, and Time Warner Cable. The events will be listed on the website in August at <http://www.ca4h.org/Projects/SET/NYSD/>

UPCOMING TRAININGS

The **2010 State 4-H Leaders' Forum** will be held November 5-7, 2010 at the Asilomar Conference Center. This year's theme, "Upgrade, S.E.T. Your System, GO!" emphasizes sharing ideas about the various ways that the 4-H Youth Development Program educates its members in science, engineering, and technology. The Saturday evening science fair is one opportunity for 4-H adult volunteers to learn about the wide array of 4-H SET activities and curricula available for their 4-H projects. Register to lead an activity or display at the science fair by **October 1**, 2010 at <http://www.ca4h.org/files/20560.doc>. Registration is due **September 1**. More information is available at <http://www.ca4h.org/Programs/Conferences/SLF/>.

Reserve the date – **February 5, 2011** – for the 3rd annual **statewide 4-H science, engineering, and technology workshops!** Workshops will take place in multiple locations across the state. The locations and the curricula are still being planned. If you have suggestions, please send them to Steven Worker at smworker@ucdavis.edu.

CURRICULUM

Lead a 4-H gardening project this year! Gardening projects help youth learn about the earth, life, nutrition, and agriculture. Here are curricula useful in planning a 4-H gardening project:

- **4-H SERIES It Came From Planted Earth** provides activities using the scientific process and discussions to gain a better understanding of agriculture. Youth begin to gain knowledge about agriculture and its application in the real world. Each session provides hands on activities for youth to explore agriculture from the beginning seeds to the foods we eat to the importance of water and soil to production. Further exploration is given about current issues in agriculture from biotechnology to integrated pest management to urban-rural interface. <http://www.ca4h.org/files/13928.pdf>
- **The Growing Classroom - Garden and Nutrition Activity Guide** includes topics on soil, plants, cycles, ecology, weather, nutrition, and food systems. Also includes team-building and sensory exploration activities, organic gardening skills, and information on how to create and sustain a successful school garden program. <http://www.lifelab.org/store-curricula.html#tgc>
- **GrowLab Activities for Growing Minds** help spark youth curiosity about plants and invite them to think and act like scientists. Developed by the National Gardening Association and written and field-tested by educators, this complete curriculum uses fun, illustrated activities to explore plant life cycles, examine plant diversity, and investigate the interdependence of plants, humans, and other living and nonliving things. <http://www.gardeningwithkids.org/10-4008.html>
- **Teams with Intergenerational Support (TWIGS)** is an intergenerational hands-on community-based educational program and curriculum that focuses on the positive development of children through integration between schools, agencies, and the community. TWIGS is an intergenerational hands-on community-based educational program and curriculum that focuses on the positive development of children through integration between schools, agencies, and the community. http://cesanmateo.ucdavis.edu/Custom_Program850/

- **Junior Master Gardener** program engages children in novel, “hands-on” group and individual learning experiences that promote a love of gardening, develop an appreciation for the environment, and cultivate the mind. JMG encourages youths to be of service to others through service learning and leadership development projects and rewards them with certification. <http://67.59.137.247/index.cfm?did=6019§ionID=6019>

International Strategy for Disaster Reduction (ISDR) has developed online games to help youth learn about planning for a disaster (tsunami, hurricane, wildfire, earthquake or flood). The on-line game aims at teaching children how to build safer villages and cities against disasters. Children will learn playing how the location and the construction materials of houses can make a difference when disasters strike and how early warning systems, evacuation plans and education can save lives. For more information, please visit <http://www.stopdisastersgame.org/en/home.html>

RESOURCES

The **Association of Science-Technology Centers (ASTC)** is an organization of science centers and museums dedicated to furthering public engagement with science among increasingly diverse audiences. Science centers give science a presence in the community and offer people of all ages and backgrounds the opportunity to ask questions, discuss, and explore. Find a science center near you at <http://exhibitfiles.net/sciencecenters/find.php>

Americans have a proud tradition of working together - from the ground-up - to protect rivers from pollution, set aside open spaces for hiking and biking, preserve wildlife habitat for fishing and hunting, and restore the cultural and historic sites that tell America’s story. The White House has established the **America's Great Outdoors Initiative** to reconnect Americans, especially children, to America's rivers and waterways, landscapes of national significance, ranches, farms and forests, great parks, and coasts and beaches by exploring a variety of efforts. Learn more and join the conversation at <http://www.doi.gov/americasgreatoutdoors/>

The Board on Science Education at the National Research Council released a draft of a **conceptual framework to guide the development of next generation standards for K-12 science education**. The framework describes in broad terms the core ideas in science and engineering that students should understand and be able to apply, and the progression of ideas students need to experience in order to comprehend them. Read the report at http://www7.nationalacademies.org/bose/Standards_Framework_Homepage.html

The **philosophy of science - The Understanding Science** website addresses what science is and how science works from a practical, everyday perspective; however, a whole field of rigorous academic study, the philosophy of science, is devoted to these topics. This side trip briefly introduces the philosophy of science and some influential people and ideas from the field: <http://www.understandingscience.org/article/philosophy>

Companies located in the United States that performed or funded **research and development (R&D)** domestically or in their overseas locations--employed 27.1 million workers worldwide in 2008, according to a new National Science Foundation report. Policymakers and industry officials consider these numbers important because workers engaged in R&D activities directly influence the creation and diffusion of knowledge, and in turn contribute to innovation and economic growth. More information is available at http://www.nsf.gov/news/news_summ.jsp?cntn_id=117276&WT.mc_id=USNSF_51&WT.mc_ev=click

EVENTS & ACTIVITIES

The **Inaugural USA Science & Engineering Festival**, hosted by Lockheed Martin, will be the country's first national science festival and will descend on the Washington, D.C. area in the Fall of 2010. Opening on 10/10/10 with a gala concert of amazing science songs performed by over 200 children and adults at the University of Maryland, the Festival promises to be the ultimate multi-cultural, multi-generational and multi-disciplinary celebration of science in the United States. More information is available at <http://www.usasciencefestival.org/>

The **Engineer Your Life (EYL) blog** is a place where teenage girls can learn about cool engineering jobs, meet inspiring female engineers and students, and find fresh info on scholarships, events and happenings in the engineering world. It's also a place for engineers, educators and parents to find engineering resources, tips and stories that will help you connect with young women about this exciting and rewarding field. <http://engineeryourlife.weebly.com/>

INCENTIVES AND RECOGNITION

The **2010 Trash to Treasure Competition** challenges kids, ages 5-19, to recycle, reuse, and re-engineer everyday materials into out-of-the-box inventions. Inventions should move things or people; or protect the environment; or be used for indoor or outdoor play. Three winners will win a trip to Boston to see their designs built and appear on an episode of Design Squad. Entries due by **September 5, 2010**. More information at <http://pbskids.org/designsquad/contest/index.html>

The **Real World Design Challenge (RWDC)** is an annual competition that provides high school students, grades 9 - 12, the opportunity to work on real world engineering challenges in a team environment. Each year, student teams will be asked to address a challenge that confronts our nation's leading industries. Students will utilize professional engineering software to develop their solutions and will also generate presentations that convincingly demonstrate the value of their solutions. More information is available at <http://www.realworlddesignchallenge.org/index.html>

The **American Geological Institute (AGI)** is sponsoring three national contests in conjunction with **Earth Science Week 2010**, celebrating the theme of "Exploring Energy," October 10-16, 2010.

- 1) Photography Contest, "We Depend on Energy" - Entrants should submit images that capture the way energy is used in their communities.
- 2) Visual Arts Contest, "Energy on Earth" - Students in grades K-5 should submit two-dimensional original pieces of art illustrating, in creative and engaging ways, where energy comes from and how it is used.
- 3) Essay Contest, "How Energy Powers the Planet," - Students in grades 6-9 should submit one-page essays focusing on how Earth system processes develop energy resources, how human use of energy affects the Earth system, and how people can be responsible stewards of Earth's energy resources.

Entries due October 15, 2010. More information is available at <http://www.earthsciweek.org/contests/>

FUNDING OPPORTUNITIES

From the State 4-H Office: Are you addressing a current issue in your community? Do you have a new idea that will help solve a local problem? If you have the ideas and the manpower and need some money to make your project happen, submit an application through the **Service-Learning RFP Program**. You could receive financial assistance up to \$5,000 for your service-learning project. Funds are awarded on a competitive basis and applications are due **September 15, 2010**. Apply for funding to support your community. Applications are on-line at <http://www.ca4h.org/Projects/Citizenship/>

From the State 4-H Office: Are you initiating a new project in your county or does your existing project need additional financial help? Funds can be requested by 4-H clubs to enable youth to develop citizenship, leadership, or life skills. New and innovative projects are encouraged but existing 4-H work that expands the reach of 4-H or increases public awareness of the program is also eligible. Applications for the **Dean Memorial 4-H Legacy Fund** are online at <http://www.ca4h.org/Resources/FundingOpps/Legacy/> and due by **September 15, 2010**.

AROUND THE STATE

In Orange County: The **Orange Acres Backbreakers (OABB) 4-H Lego Robots** project gives members ages 9 - 18 the opportunity to build and program the Lego Mindstorms robots, in an interactive and collaborative setting. The team was highlighted on International Google Lunar X Prize website! The project members have participated in the MoonBots program where they are dealing with some pesky ants! "At our meeting today we glued on the perimeter pictures with some adhesive glue. We figured out some great techniques to put it on, but it is still hard to get the perimeter pictures to line up with the poster board. As we were working there were a bunch of ants underneath our feet, and we didn't realize it till we were about half way done with everything." View the full story at <http://thelaunchpad.xprize.org/2010/07/moonbots-teams-receive-mindstorms-kits.html> or visit the team's webpage at <https://sites.google.com/site/oabb4hlegorobot/>

In Sacramento County: The Tootie Fruity Nutty Buddies of Gold River 4-H Club are a prime example of learning by doing. For the past six years the group's leader, Carolyn Ricchiuto, has led meaningful, hands-on learning experiences and projects completing a different chapter of the Junior Master Gardener Level One Teacher/Leader guides allowing her youth to earn various JMG Golden Ray Series certifications. Read more about this project at <http://67.59.137.247/index.cfm?did=16178§ionID=2106>

In Siskiyou County: The **Afterschool Science Service Learning Project** used teens to deliver hands-on science activities to afterschool programs. The program encompassed six afterschool locations, State 4-H Field Day and the County Agriculture Education day. Through the afterschool programs the group was able to reach 110 youth ages K-6th grade. In addition, twelve teens participated and were trained to set up lessons, how to be an effective facilitator, and how to provide lessons that helped youth find their own answers to questions about each lesson (inquiry learning). Teens were able to gain insight into their unique leadership abilities and leadership style. More information is available at <http://www.ca4h.org/?story=205>

In Alameda County: 4-Her Jessica Choi took on the challenge and collaborated with Dr. B. William Choi to create a hands-on, inquiry-based curricula entitled "**Cardboard Automaton- Simple Machines Workshop**." This workshop explores the ideas of simple machine elements such as cams, levers, and linkages. More information is available at <http://www.ca4h.org/?story=218>

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