4-H Science, Engineering, and Technology E-News
January 2011

4-H science, engineering, and technology (SET) projects engage youth in experiential and inquiry-based learning in a positive youth development environment. Through participation, youth improve their science, engineering, and technology knowledge, skills, and confidence. The goal of 4-H SET is to increase the number of youth pursuing education and careers in science, engineering and technology. http://www.ca4h.org/Projects/SET/.

**FEATURED NEWS**

In the United States, there are concerns about a lack of youth science literacy. Reports, such as the book, *Rising Above the Gathering Storm*, paint a worrisome picture, and while government studies including, *PISA 2009: Performance of U.S. 15-Year-Old Students in Science and Mathematics*, show a slight improvement over the past three years, U.S. youth tend to perform less well in science compared with youth in other nations.

But why do our youth (and adults) need to know science concepts and processes? In his book, *Why Science?*, James Trefil outlines three cases for everyone to have a fundamental level of science literacy:

- **Civics**: In politics and civic debates, a significant proportion of the conversation centers on advances in science and technology. A person needs a basic level of science literacy in order to fully make sense of these advances and contribute to the dialogue.
- **Culture**: Science has a social component and ideas are shaped by the social context. Fruitful debate on the role of innovation relies on a bridge between the public and scientists. The stability of this bridge depends on mutual understanding and definitions of science concepts and processes.
- **Aesthetics**: Understanding of science can improve a person’s appreciation for the aesthetic beauty in the universe. Being able to grasp the fundamentals of complex biological systems or the primeval creation of geological formations may draw our eyes to details that an untrained eye would pass over.

In 2011, as you continue in your role as a facilitator of 4-H learning experiences, think about ways to engage youth 4-H members in science! Every 4-H project has a connection to science, engineering, and/or technology. Help youth explore the world, discover new concepts, and practice science processes. In our role as a youth development organization, we can have a positive impact on youth science literacy!

When facilitating activities with a group of youth, step back and evaluate yourself.

- Who’s doing most of the talking? Hopefully the youth are discussing, questioning, and exploring while you are acting as a facilitator (not a teacher).
- Are you asking open-ended questions? Do your questions use the terms discuss, interpret, explain, compare, evaluate, instead of what, when, who, where?
- Are there opportunities for youth to apply their learning in real world situations? Perhaps through community service / service learning activities?
Upcoming Trainings

2011 4-H SET Workshops
February 5, 2011 from 9am-4pm, registration due January 24. Free!
http://ucanr.org/set/
Counties are invited to send a team of 4-H teen leaders, 4-H
volunteers, 4-H staff, and afterschool partners to the 2011 4-H SET Winter Workshops. The workshops
emphasize experiential and inquiry-based learning, providing practical examples of incorporating hands-on
activities that invite youth exploration, promote active questioning, and application to the real world. These
workshops will assist in increasing the knowledge, skills, competencies, and confidence levels of adult
volunteers, teens and staff to provide engaging 4-H SET learning experiences. Flyer available at
http://www.ca4h.org/files/63643.pdf

Locations and Curricula:
Humboldt County (Eureka)
- Biosecurity in 4-H Animal Science (presented by Sandy Sathrum), max 30 people
- Junk Drawer Robotics “Give Robots a Hand” (presented by Jessica Paine), max 25 people

Tehama County (Red Bluff)
- Youth Experiences in Science (presented by Rita Boyes), max 24 people

Butte County (Oroville)
- TechXcite: Discover Engineering “Quest for Speed” (presented by Matthew Portillo), max 40 people

Yolo County (UC Davis)
- There’s No New Water! (presented by Steven Worker), max 30 people
- Youth Experiences in Science (presented by Marianne Bird), max 24 people
- Biosecurity in 4-H Animal Science (presented by Martin Smith), max 30 people

Merced County
- Junk Drawer Robotics “Give Robots a Hand” (presented by Richard Mahacek), max 40 people

Santa Cruz County (Watsonville)
- TechXcite: Discover Engineering “Quest for Speed” (presented by Lynn Schmitt-McQuitty), max 30 people

Kern County (Bakersfield)
- There’s No New Water! (presented by John Borba), max 30 people

Los Angeles County (Mt. San Antonio College)
- Exploring your Environment (presented by Cynthia Barnett), max 30 people
- Biosecurity in 4-H Animal Science (presented by Steve Dasher), max 30 people
- TechXcite: Discover Engineering “Quest for Speed” (presented by Keith Nathaniel), max 30 people

Annual California Ag Teachers Association Conference
June 19-23, 2011, Cal Poly, SLO
http://www.calagteachers.org/
The purpose of the CATA is to promote and improve the teaching of agriculture in California and to foster the
welfare of those engaged in this work.

2011 National Association of Extension 4-H Agents (NAE4-HA) Conference
October 24-28, 2011 in Omaha, Nebraska
Call for Presentations due January 31, 2011
http://2011nae4ha.unl.edu/
The Conference is held annually for 4-H staff and professionals from across the nation. 4-H staff are invited to
submit a proposal for presentations. Proposals for presentations at the 2011 NAE4-HA Annual Conference are
submitted online by 12:00 midnight (EST), January 31, 2011.
New curriculum from 2009-2010!

There’s No New Water!
Middle and High School Age
$16.00
http://4-hmall.org/Product/newitems/theres-no-new-water/08420.aspx
There’s No New Water! is grounded in a simple yet powerful concept that water is a finite natural resource whose quantity and quality must be responsibly preserved, protected, used, and reused. The There’s No New Water! is designed for high school age youth, beginning with an exploration of the natural water cycle; exploring human interventions that affect water quality and quantity; examining the effects of the urban/rural interface on water quality and quantity; and includes the implementation of service-learning projects that address local water conservation issues.

Project Butterfly Wings
Grades 4th – 8th
$7.95
http://www.4-hmall.org/Category/4-hcurriculum-butterfly.aspx
Youth explore butterfly habitats, learn how to identify common butterflies, become a citizen scientist and contribute data as they enter their findings on the web site. Youth create investigations to answer questions or solve problems and share their findings with others.

Exploring Your Environment
Middle school
$5.95
http://online.4-hcurriculum.org/curriculum/environment/
The National 4-H Exploring Your Environment series provides opportunities for youth to engage in learning about environmental science through hands-on, experiential learning experiences in the natural sciences and technology. In addition, facilitators are instructed in planning, managing and teaching environmental concepts to youth through indoor and outdoor activities on their own and with others.

Youth Development through Veterinary Science
Middle school
FREE
http://www.ca4h.org/Projects/Curriculum/SETCurriculum/

Rabbits: From the Animal’s Point of View
Middle school
FREE
http://www.ca4h.org/Projects/Curriculum/SETCurriculum/
Wild rabbits are found on every continent except Antarctica. Domesticated rabbits come in many breeds that vary in shape, size, and color. But what does it mean to be a rabbit? This curriculum introduces youth to rabbits, their behavior, nutritional and housing needs, and appropriate care through hands-on, inquiry-based activities that follow the experiential learning cycle.

**Agua Pura: Exploring Salmon and Steelhead in California Communities**

Upper elementary and middle school

FREE

[http://www.ca4h.org/Projects/Curriculum/SETCurriculum/](http://www.ca4h.org/Projects/Curriculum/SETCurriculum/)

This 4-H utilized curriculum, AguaPura, is designed to enhance participants’ understanding of salmon and steelhead and the critical relationship these fish have to healthy watersheds. Through a variety of “hands-on” and “heads-on” learning activities, participants are encouraged to explore their surroundings and the connections between salmon and steelhead and the people in their community.

**Resources**

**Science Pirates: The Curse of Brownbeard**

[www.sciencepirates.com](http://www.sciencepirates.com)

Approximately 2 hours to complete

Science Pirates: The Curse of Brownbeard is a 3D educational computer game that communicates food safety knowledge in an environment of scientific exploration. Learners will engage in testing variables, understand hypothesis formation, draw conclusions, and make recommendations for hand washing behavior.

**Engineer Your Life** is a guide to engineering careers for high school girls! Imagine what life would be like without pollution controls to preserve the environment, life-saving medical equipment, or low-cost building materials for fighting global poverty. All this takes engineering. In very real and concrete ways, women who become engineers save lives, prevent disease, reduce poverty, and protect our planet. Read more at [http://engineeryourlife.org/](http://engineeryourlife.org/)

WGBH and The American Society of Civil Engineers created a new interactive scavenger hunt game to help kids explore civil engineering and topics of sustainability. See if you can find all 20 ways that civil engineers are helping to make communities more livable. Visit ASCEville at [http://content.asce.org/asceville/index.html](http://content.asce.org/asceville/index.html)

From Understanding Science:

- Read firsthand accounts from scientists explaining how they became interested in science and why they love their jobs - [http://www.callofscience.com/](http://www.callofscience.com/)
- 125 Questions: What we don't know - Visit Science magazine's website to explore some of the big questions that scientists are studying right now - [http://www.sciencemag.org/site/feature/misc/webfeat/125th/](http://www.sciencemag.org/site/feature/misc/webfeat/125th/)
- Why is science important? - Visit WhyScience to find out what the big deal about science is. Watch videos and read testimonials from scientists and lots of other folks explaining why they think science is great! You can even contribute your own views - [http://whyscience.co.uk/](http://whyscience.co.uk/)

California School-Age Consortium (CalSAC) – Antelope Valley Conference  
February 26, 2011, 9:00am – 1:30pm, Santa Clarita, CA  
$15 per person (includes lunch)  
http://www.calsac.org  
Come celebrate the afterschool field with CalSAC’s Los Angeles Chapter! Join us for a fun day of hands on learning, sharing and networking with all levels of afterschool programming. You’ll walk away with a variety of new ideas and activities to take back to your program, including supporting STEM "Crime Scene Investigation".

UC Davis CA&ES Field Day  
March 5, 2011, 7:15am - 6:00pm  
http://www.ca4h.org/files/66944.pdf  
UC Davis College of Agriculture and Environmental Sciences are hosting the 35th annual CA&ES Field Day on March 5, 2011. Over 3,000 FFA and 4-H members (age 14 and older) will participate in 26 contests. High school aged 4-H members are invited to participate and/or observe the contests held on the UC Davis campus. This event will also serve as the California 4-H State Qualifier for the National 4-H Livestock Judging, Dairy Cattle Judging, and Poultry Judging contests.

2011 Google Science Fair  
http://www.google.com/events/sciencefair/  
Google has partnered with NASA, CERN, National Geographic, Scientific American, and LEGO to create a totally new kind of STEM competition: a science fair that is more open, inclusive, and global than ever before. The Google Science Fair aims to be the largest global science competition ever and will be open to all students age 13–18 around the world.

State 4-H Field Day  
May 28, 2011 at UC Davis, 9:00am – 6:00pm  
http://www.ca4h.org/Programs/Events/SFD/  
Since 2002, the State 4-H Field Day takes place annually on the Saturday of Memorial Day weekend at the UC Davis campus from 8:00am until 6:00pm. The event is open to all 4-H members, volunteers, staff, and parents. During the event, 4-H members may participate in a variety of contests and educational activities.  

Festival of Science: Curious about how things work? Want to know more about something? At the 2011 California State 4-H Field Day, University scientists will answer your questions! Provide your question ahead of the event and we will find the right scientists to provide an answer.  
http://www.ca4h.org/Projects/SET/Initiative/Questions/  

Special Recognition at the 2011 State 4-H Presentation Day: A special recognition pin will be awarded for youth who participate in State Presentation Day and focus their presentations on science, engineering and technology! This year’s focus is on the natural properties and the human interactions with water. Potential topics include water quality, conservation, water cycle, effects on plants and organisms, water in cultural contexts, human impacts on water, phases and/or properties of water, storage and transportation.  
http://www.ca4h.org/Programs/Events/SFD/PD/Recognition_Opportunities/
**The Spirit of Innovation Awards: A Call for 13 to 18 Year Old Students**
Deadline is January 17, 2011

The Spirit of Innovation Awards program, challenges students to solve real world problems by creating innovative products in three fields of science: Clean Energy, Aerospace Exploration and Cyber Security. The awards are built upon the legacy of Apollo 12 Commander, Pete Conrad. Using science, technology and entrepreneurship, student teams develop innovative products to compete for over $80,000 of funding, and support to pursue the commercialization of their ideas. Submit your Technical Report, Business Plan, and Graphic representation to qualify as a Finalist team. All Finalists receive $2000 to present at the Innovation Summit at the NASA Ames Center in Silicon Valley, California. Winning teams are recognized as Pete Conrad Scholars and awarded $5000 to continue developing their product along with exclusive memberships, scholarships, and endless opportunities to commercialize their innovation.

**2011-2012 National 4-H GIS/GPS Leadership Team**
Applications due February 1, 2011
For 4-H teens and adults
[http://www.ca4h.org/files/66954.doc](http://www.ca4h.org/files/66954.doc)

Are you interested and experienced with GIS and/or GPS? Would you like to learn more by working with other 4-Hers from across the nation? The National 4-H GIS/GPS Leadership Team provides guidance and recommendations for 4-H GIS/GPS projects. A state team is composed of one or two 4-H teens and one adult. Team members participate in the ESRI International GIS Educator conference in San Diego, July 7-13, and then spend 2 hours a month for a year afterwards implementing a national leadership plan.

**National Ag Day Essay Contest**
Deadline is February 4, 2011
[http://www.hpj.com/agdayessay](http://www.hpj.com/agdayessay)

The 2011 theme is “American Agriculture: Your Food. Your Farmer.” Students (grades 9-12) are invited to submit an original, 450-word essay or a two-minute video essay about the importance of agriculture. The national written essay winner and video essay winner receive a $1,000 prize and round-trip ticket to Washington, D.C., for recognition during the Celebration of Ag Dinner held March 15 at the USDA.

**Funding Opportunities**

**4-H SET Request for Proposals**
For Gardening, Landscaping, Environmental Restoration, and Reforestation Projects
Due February 28, 2011
[http://www.ca4h.org/Projects/SET/Initiative/RFP/](http://www.ca4h.org/Projects/SET/Initiative/RFP/)

4-H helps youth develop and understanding and appreciation for the environment. In 4-H, youth learn about the environment and become environmentally aware through projects in environmental stewardship, gardening, landscaping, forestry, and soil & water conservation. Through a generous gift from the California Landscape Contractors’ Association (CLCA) through The California 4-H Foundation, the State 4-H Office is pleased to offer funding up to $2,000 per project for ten projects that combine water quality/conservation with landscaping, gardening, environmental restoration, reforestation, and other environmentally-focused activities.
Captain Planet Foundation Grants
Deadline is January 25, 2011
http://www.captainplanetfoundation.org

The mission of the Captain Planet Foundation is to fund and support hands-on, environmental projects for children and youths. The Foundation is interested in funding innovative programs that empower children and youth to work towards solving environmental problems in their neighborhoods and communities. All funded projects must involve young people ages 6-18 (elementary through high school). Nonprofit organizations and public schools worldwide are eligible to apply for grants of $250 to $2,500.

AROUND THE STATE

In Sacramento and San Luis Obispo Counties: Both Marianne Bird in Sacramento and Richard Enfield in San Luis Obispo were selected to be featured in the 4-H Science in Urban Communities Promising Practices Guide arriving in time for the Department of Defense (DoD) / USDA Conference in April. Fifteen 4-H professionals from throughout the country were selected based on surveys of 4-H faculty and staff in urban communities.

Around the Nation: The 4-H Million Trees Project continues to grow! To date, over 34,280 4-H youth in 45 US states, Canada, and Caribbean nations and have planted 268,846 trees. All 4-H clubs are invited to join the project by planting trees and reporting on the website at www.4hmilliontrees.org. “Every day is a good day to plant a tree!”

In San Mateo County: The San Bruno 4-H Club Robotics Team participated at a First Lego League (FLL) tournament in late November. Eight 4-H members and two 4-H volunteers participated in the event, with their team named “It Should Have Worked.” The team was challenged to complete as many missions as possible within a 2 minute 30 second round. The robot had to snag a patent before the other team did, attach bionic eyes to a certain area on the table, and repair bone damage by applying a cast.