4-H Science, Engineering and Technology (SET) Initiative

www.ca4h.org/SET/

WHY 4-H SET?

Despite our country's rich legacy of innovation and global contributions, we face declining proficiencies and workforce shortages in science, engineering, and technology fields. Nationwide only 18% of high school seniors are considered proficient in science while only approximately 15% of today's college graduates earn degrees in science and engineering.

EXPECTED OUTCOMES

The goal of the 4-H SET Initiative is to address America's critical need for more scientists and engineers by engaging 150,000 youth by 2013. 4-H SET activities improve SET skills, knowledge and awareness among youth. 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.

WHAT IS 4-H SET?

4-H SET activities and projects combine **non-formal education** with **hands-on, inquiry-based learning** in a **positive youth development** context to engage youth in improving their SET knowledge, skills and abilities. 4-H SET activities and projects combine the strengths of the 4-H Youth Development Program's non-**formal experiential-based delivery modes** and strong **youth-adult partnerships** to address SET content as defined by the **National Science Education Standards**.

NATIONAL SCIENCE EDUCATION STANDARDS

The National Science Education Standards present a vision of a scientifically literate populace. Using a grade-level approach, they outline what students need to know, understand, and be able to do to be scientifically literate. The Standards hold to the principles that science is for all youth and learning science is an active process.

SET CONTENT understanding and SET ABILITIES

Both science content and abilities (processes) are critical to increase science literacy. Science abilities unify science disciplines and provide youth with powerful ideas to help them understand the natural world.

EXPERIENTIAL and INQUIRY Learning

Experiential learning is based on the idea that experience matters in the learning process. Through concrete learning experiences, youth are encouraged to think, explore, question, and make decisions. In inquiry-based learning, youth build understanding through active exploration and questioning.

POSITIVE YOUTH DEVELOPMENT context

Positive youth development occurs from an intentional process that provides youth opportunities to learn new skills, experience independence and develop concern for others in a positive learning environment. Contextualizing SET learning experiences within a positive youth development framework is critical in helping youth learn, grow, and contribute to their communities.

MENTORING AND PARTNERING with youth

Learning experiences are led by trained, caring adult staff and volunteers acting as mentors, coaches, facilitators and co-learners who operate from a perspective that youth as partners and resources in their own development.

EXTENDED LEARNING OPPORTUNITIES

In-depth, long-term projects will have a greater impact on learners. SET programs should consider the frequency and duration needed to increase youth knowledge, skills and attitudes.

Program Development/Design

4-H staff and volunteers **develop, design, and deliver 4-H SET programs to youth in diverse settings** and locations that have current, content and are contextually appropriate. Through this program design and implementation strategy, 4-H volunteers and staff provide opportunities for youth to increase knowledge, skills, and competencies and improve their attitudes about science, engineering, and technology. Each county has 4-H programming in club, camp, afterschool, in-school and other settings. Through each of these delivery modes, new youth are engaged in learning science, engineering and technology.

Volunteer/Professional Development

Effective Science Education Requires Good Educators. Good educators of science create active learning environments. Professional development opportunities help prepare 4-H adult volunteers, teens and staff to incorporate science, engineering, and technology into 4-H projects and activities in a hands-on, experiential manner. These professional development experiences assist in increasing the knowledge, skills, competencies, and confidence levels of adult volunteers, teens and staff to provide engaging 4-H SET learning experiences.

Curriculum

A wide variety of 4-H SET curricula that support the National Science Education Standards (NSES) have been identified, adapted/developed, and implemented. By working with 4-H volunteers and staff, land-grant college and university faculty, 4-H SET content experts, and other partners the 4-H program infuses new, exciting and innovative materials to reach new audiences and enhance the 4-H experience. An online curriculum database is available with identified SET-Ready electronic curricula. Educators may download these packages to use in a variety of settings.

4-H SET curriculum includes:

Marine Science	Wildlife and Fish	Gardening	GPS and GIS
Animal Science	Agriculture	Computers	Web Design
Biosecurity	Water Quantity and Quality	Aerospace & Rocketry	Agriculture Technology
Environmental Stewardship	Plant Science	Robotics	Veterinary Science
Foods and Nutrition	Entomology	Clothing & Textiles	Zoology
Soil Science	Forestry	Geology & Earth Science	Video Production

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