



WASHINGTON STATE
UNIVERSITY
EXTENSION



4-H SCIENCE

A New Way of Thinking

BY THE NUMBERS

- 4-H Science programs currently in 30 of 39 Washington counties.
- 1,000 faculty, staff, and volunteers participated in STEM training at national, regional, and statewide professional development events.
- More than 15,000 4-H Science bookmarks distributed to promote *A New Way of Thinking*.
- In 2015, more than 3,000 youth in Washington participated in the "Motion Commotion" experiment.
- Since 2010, nearly \$1.9 million in grant funds, and \$24,000 in local gifts received to support STEM-focused programs.

2016

ISSUE

America faces a future of intense global competition with a startling shortage of scientists. In 2005, only 18% of U.S. high school seniors were proficient in science (National Assessment of Educational Progress (NAEP); 2005) and a mere 5% of current U.S. college graduates earned degrees in science, engineering, or technology, as compared to 66% in Japan, and 59% in China. By 2011, the NAEP reported an increase in science literacy; however, the United States still lags behind its global partners. Literacy in science, technology, engineering, and math (STEM) is a prerequisite for young people who face the challenges of our complex world.

RESPONSE

To address the growing demand for STEM professionals, and to increase STEM literacy for youth, Washington State University 4-H has implemented the 4-H Science program: *A New Way of Thinking*. Objectives include:

- Increase youth interest, literacy, and engagement in STEM;
- Increase the number of youth pursuing post-secondary education in STEM; and
- Increase the number of youth pursuing STEM careers.

While 4-H projects have long been grounded in science, they have not often been framed as science. Faculty, staff, and community partners now encourage a new way of thinking that brings the researched science base of the curriculum to the forefront. Today's 4-H youth engage in science learning through traditional club experiences, day camps and residential camps, afterschool programs, fairs, conferences, and workshops.

WSU 4-H assembled two teams of "4-H Science Champions," in Pullman and Seattle, to bring together creative thinking, exploratory questions, and visionary strategies to move 4-H Science forward. The committees, involving WSU and 4-H faculty, researchers, business and community leaders, and STEM professionals, reviewed the target program areas for 4-H Science, prioritized critical needs for STEM, and identified potential partners and strategies to address the needs.



QUOTES

"I came into the program with almost zero knowledge of engineering or mechanics and learned a lot from different mentors. I now know how to use computer-aided design programs and different mechanical tools."

"Getting the pneumatics to work was a problem at the Robotics competition. We put out a message to other teams and they gave us a hand. These are teams we were competing with. It's 'gracious professionalism.' It's about competing, respecting one another, and trying to make sure everyone gets the most out of the experience."

"I enjoyed doing the Biofuels experiment, recording the results, and making a poster of my findings. I plan on researching more about how to become a chemical engineer after doing this."

GRANTS & DONORS

- Office of Juvenile Justice & Delinquency Prevention
- National 4-H Council
- Altria and Lockheed Martin
- Avista Utilities

IMPACTS

- WSU 4-H Science has:
 - Raised awareness and changed attitudes about science learning and science careers;
 - Increased science skills and understanding of science concepts; and
 - Improved outreach to broader audiences and new partners to engage in STEM programs.
- 4-H Science is implemented in 30 of 39 counties in Washington, with programs in robotics, digital photography, environmental sciences, animal sciences, computer sciences, shooting sports, plant sciences, and engineering and technology.
- More than 1,000 faculty, staff, and volunteers have participated in STEM professional development training events at the national, regional, and statewide levels. Raising the awareness of 4-H members and leaders that 4-H Science is diverse, and can be included in multiple projects and delivery modes, has been effective in growing the 4-H STEM emphasis.
- Since 2010, nearly \$1.9 million in grant funds and \$24,000 in local gifts have provided impetus to develop and implement a range of STEM-focused programs across the state.
- In 2015, more than 3,000 Washington youth participated in the National Youth Science experiment "Motion Commotion." The experiment challenged youth to explore motion, speed, and reaction time, and learn about the hazards of distracted driving. Youth had the opportunity to learn engineering concepts, develop math skills, learn about physics, and help solve a relevant safety issue.
- Sharing opportunities and successes of local 4-H Science programs has increased support and expansion of STEM literacy programs. More than 15,000 4-H Science bookmarks have been distributed across the state to market *A New Way of Thinking*. Feature stories on the WSU 4-H website and in Extension publications have put 4-H Science in the spotlight.



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