



WASHINGTON STATE
UNIVERSITY
EXTENSION



4-H NATIONAL YOUTH SCIENCE DAY

Learning by Doing

BY THE NUMBERS

- 25 counties in Washington coordinated events for youth to participate in National Youth Science Day in a variety of settings including, classrooms, afterschool programs, special events, and club meetings.
- Faculty, staff, volunteers, and teen leaders reached more than 4,000 youth through the National Science Experiment in 2015.
- 12 counties received financial support from a National Mentoring Grant to implement National Youth Science Day events.
- 11 counties received support from Avista Foundation to provide hands-on learning for youth engaged in the National Youth Science experiment.
- Colville Reservation Extension 4-H has participated in all 8 of the National Youth Science Day events since 2008!

2016

ISSUE

Our nation is falling behind other countries in the fields of science, technology, engineering, and math (STEM). Participation in high-quality positive youth development programs offers youth and adults the opportunity to engage in scientific exploration and work together to build the next generation of our nation's scientists, engineers, and mathematicians.

Today the U.S. ranks 27th among developed nations with college students receiving science or engineering degrees. Only 1% of 4th graders, 2% of 8th graders, and 1% of high school seniors are deemed "advanced" in science. Only 45% of high school graduates in 2011 were ready for college work in math, and 30% in science.

A recent longitudinal study conducted by Tufts University, *The Positive Development of Youth: Comprehensive Findings from the 4-H Study of Positive Youth Development*, revealed 4-H programming gets young people more connected to science. 4-H'ers are two times more likely to take part in science programs outside of school. Consistent with the Tuft's study, Washington State 4-H Youth Development program is engaged in promoting STEM learning opportunities for youth by offering diverse hands-on learning experiences that explore the sciences.

RESPONSE

Since 2008, National 4-H Council has led the way in a rallying event to bring together youth and volunteers across the nation to simultaneously complete a National Science Experiment during National 4-H Week in October. WSU 4-H has engaged youth throughout the state in taking on the challenge to participate in the annual science experiment. The experiments not only have introduced various science and engineering challenges, but also have engaged learners in strategies to address real world problems. Experiments focusing on protecting the environment and learning skills to be savvy consumers have increased interest in STEM learning and inspired youth to ask critical questions.

The 2015 National Science Experiment, *Motion Commotion*, explored the science of motion through the relationship of speed and stopping distance. The experiment extended to a real-world investigation on reaction time and safety, making connections to the dangers of distracted driving. Youth used a toy car, a figure made of modeling clay, and a ramp to observe collisions, to investigate the physical factors of motion and what influences a car's ability to stop. They learned about Newton's Laws of Motion and how to measure speed. Teens and volunteer leaders facilitated the experiment with youth in grades 4 and above and engaged them in activities to explore how distractions such as cell phones can influence reaction time and safety.



QUOTES

“It was more difficult to teach young kids about distracted driving, but they were able to relate it to walking or cycling and how important it is to not use a cell phone or radio that could interrupt their focus.” – Teen leader

“By showcasing science in a non-formal and interactive way, and allowing youth to think outside the box, we encourage scientific exploration that may not occur in the classroom.” - Linda McLean, Director 4-H/Ag & Nat. Resources/FRTEP Educator, WSU Colville Reservation Extension

“When the car hit the books, the clay people flew out of the car!” - The third grade student was surprised by how different kinds of collisions affected the clay passengers in the car. Seeing the reaction made it very real.

Avista Foundation has made generous contributions to 4-H science education since 2011. Avista supports the 4-H mission to increase the pipeline of youth seeking engineering and technical careers by helping to grow an interest in science, technology, engineering, and math. Avista Foundation funds the resources to implement the National Youth Science Experiment annually and provides scholarships through the Avista Scholars program. Avista Foundation’s ongoing commitment to 4-H science has caused participation in the National Youth Science Experiment to grow annually in Washington.

Five years of grant funding from the Office of Juvenile Justice and Delinquency Prevention and National 4-H Council for the National Mentoring Program has provided valuable resources in twelve county program sites to implement the National Youth Science Experiment. Youth and mentors engage in inquiry learning as they conduct science experiments that stimulate their interest in STEM.

Many county 4-H programs also benefit from the support of local donors to implement science education programs including the National 4-H Science Experiment and summer day camp science adventures.

IMPACTS

The 2015 National Youth Science Experiment was successful in achieving the goal to provide hands-on learning experiences with exploration of motion, stopping distance, and reaction time. The first step was setting up the experiment to measure the stopping distance of the model car. The youth explored how reaction time influences physical action, and how speed and mass determine action and physical response. Exploring the concepts of motion, force, action, and reaction became very real when they applied what they learned to the problem of distracted driving, walking, or cycling. The experiment was rich with multiple dimensions to engage youth in STEM learning. Participants in the experiment demonstrated the following:

- Overall increase in STEM learning;
- Increased understanding of physics and the laws of motion;
- Awareness of how physical and human factors can influence reaction time;
- Ability to work as a team to conduct the experiment and record observations; and
- Willingness to take personal action to focus on safety in their daily lives.



WASHINGTON STATE UNIVERSITY
EXTENSION