

COOPERATIVE
EXTENSION
SERVICE



College of Agriculture,
Food and Environment

When you support
4-H Science
Engineering and
Technology (SET)
programs, youth
work as a team
to apply critical
thinking and
problem solving
skills and generate
a competitive
workforce for
Kentucky.



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EXTENDING KNOWLEDGE *Changing Lives*



The Calloway County Robotics team prepared for competition.

4-H Robotics Programs Inspire Kentucky's Youth to Pursue Science, Engineering, and Technology

Kentucky 4-H advised four competition teams in 2012-2013 where youth participated in the FIRST (For Inspiration and Recognition in Science and Technology) LEGO League, that required students to design, construct and program a robot that could accomplish specific task challenge.



Critical thinking, problem solving skills, and teamwork

Through **4-H Science, Engineering and Technology (SET)**, Kentucky youth engage in Scientific Inquiry as well as the Engineering Design Process. This program not only helps youth understand content but provides the opportunity for hands-on learning practices. During the 2011-12 program year, over **150,000 Kentucky youth**, in grades 4 through 12, took part in some aspect of the 4-H SET program.

4-H presents SET programs in classrooms, after-school programs, special interest clubs and competitive teams. A grant allowed 4th grade students in **Russell, Spencer, and Wayne** counties to conduct 4-H Physics Zoo where they experimented with unequal air pressure, opened and closed circuits, components of white light, pulleys, kinetic and potential energy and the center of balance. High school students, such as the sophomores in **Daviess and Metcalfe** counties, participated in the National Science Day “Eco-Bot Challenge” designing a robot to perform a task related to environmental cleanup. In **Jefferson County**, home school students were introduced to energy, electricity, and robotics with the 4-H Power of the Wind curriculum.

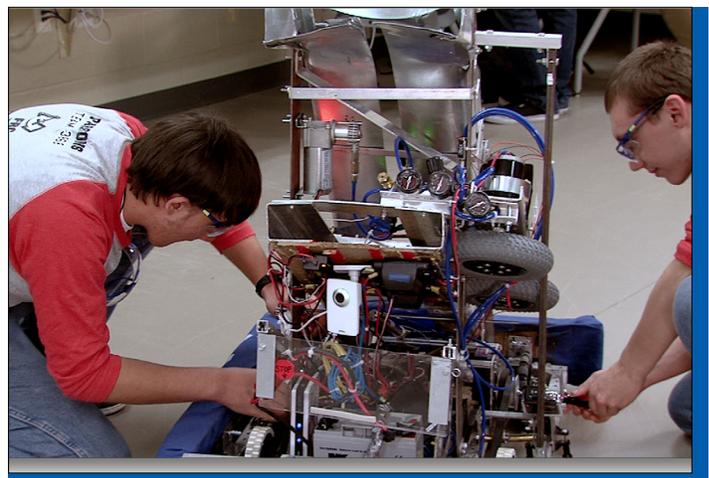
Kentucky 4-H makes it possible for over 150,000 youth each year to experience life skill decision making through development of critical thinking, problem solving and scientific processing skills. These skills will not only help them in relation to STEM fields, but also allow them to make better, more analytical decisions in all aspects of their lives.

According to 4-H Science eAcademy (2012), “Recent research suggests that learning science requires fluency in multiple aspects of conceptual understanding, practices of science, and identification with the scientific community. While 4-H programs have historically emphasized the development of science process skills (which refer to measurable behaviors and transferable abilities reflective of processes involved with scientific reasoning), there is movement towards more authentic engagement in scientific and engineering practices, as outlined in the new Framework for K-12 Science Education. Science and engineering are human enterprises. To be scientifically literate, youth need to jointly understand scientific and engineering concepts, be able to engage in scientific and engineering practices, and see themselves as consumers of and contributors to the scientific community.”



Students create a computer program to operate the robot

4-H youth report better grades, higher levels of academic competence, and an elevated level of engagement at school



Making adjustment so robot can perform task accurately.