

STEMaster Training and the *Colorado 4-H Program*

Colorado State University
Extension 

 **summit**
education foundation
Summit STEM

 **Summit County**
COLORADO

committed to excellence



Exciting New Opportunity for Your School

STEM (Science, Technology, Engineering & Math) After School Programs

Summit schools have a fantastic opportunity to provide STEM after school programs with training from Colorado State University (CSU). Summit School District has been chosen to pilot a new State 4-H STEMasters program. CSU is providing all the materials, curriculum and training for after school 4-H STEM programs.

Volunteering to help lead these programs is a huge opportunity to have a direct impact on your child's education. You do not need a science background to volunteer as a STEMaster 4-H leader. We are recruiting teams of volunteers and teachers to offer an after school program in the Summit School District schools. The STEMasters Training is open to high school students as well, to become 4-H Junior-Leaders in the elementary after school programs.

CSU's regional and state STEM/Youth Development Specialists will be offering four STEM module trainings:

Robotics (Ages 8-18; LEGO Mindstorms NXT,

Junk Drawer, and Gear Tech 21)

Energy (Ages 8-18; Wind, Clean Energy, Electricity)

Environment (Ages 8-18; Exploring Your Environment, Water, Forestry, Ornithology)

Science 101 (Ages 8-12; Science Discovery-physical, earth/space, life; Project Butterfly)

Be a part of this positive action, join our Team and become a STEMaster 4-H leader. All 4-H volunteers are required to complete background and reference checks through CSU.

Contact: Kathie Kralik
CSU Extension Summit County
4-H Youth Development
Program Manager
(970) 668-4142
KKralik@co.summit.co.us

CSU STEMasters Training (12 Hours)

Friday, March 9, 5:30– 9:30 p.m.

Senior/Community Center

Youth Development Skills (Experiential Learning, Essential Elements, Child Development 101)-4 hours

Saturday, March 10, 8:00 a.m.-5:00 p.m.

Summit Middle School

STEM Customized Training (4 Modules: Robotics, Energy, Environment, Science 101)-8 hours

Training Fee: \$50.00—Includes instructor training, curriculum, resources, lunch and refreshments. Partial scholarships available from the Summit Education Foundation, if needed.

CSU Graduate Credit: Teachers can earn graduate credit or CEU's. Colorado State University EDUC 591A-1 credit for \$55.00 or 1.2 CEU for \$50.00. Graduate Credit requires an additional 3 hours on Saturday, March 10, 6:00– 9:00 p.m. and completion of a project.



Dr. Karl Topper's Dillon Valley Elementary School Science Mentor Class



STEMaster Registration

Name: _____

Mailing Address: _____

Phone: _____ Email: _____

STEMaster 4-H Volunteer at which schools?: _____

Foundation of Positive Youth Development Training - 4 hours
Friday, March 9, 5:30 p.m. - 9:30 p.m., Senior/Community Center
Experiential Learning, Essential Elements, Child Development 101
For all STEMaster 4-H volunteers

4-H STEM Modules Training - 8 hours
Saturday, March 10, 8:00 a.m. - 5:00 p.m., Summit Middle School
Check below to register for the STEM module training of your choice. Register for only one module.

- ___ **Robotics** (Ages 8-18; LEGO Mindstorms NXT, Junk Drawer, and Gear Tech 2 1)
- ___ **Energy** (Ages 8-18; Wind, Clean Energy, Electricity)
- ___ **Environment** (Ages 8-18; Exploring Your Environment, Water, Forestry, Ornithology)
- ___ **Science 101** (Ages 8-12; Science Discovery - physical, earth/space, life; Project Butterfly) - Volunteers with little to no science background and teachers who are uncomfortable teaching science or math; basics of physical, earth and life sciences.
- ___ **Optional graduate credit or CEU training (6:00 - 9:00 p.m.)** - Assessment and State Standards training; project required

Descriptions of the modules are attached.

STEMaster Training Fee - \$50.00
Includes instructor training, curriculum, resources, refreshments on Friday evening, lunch and refreshments on Saturday.
Optional graduate credit: Colorado State University EDUC 591A—1 credit for \$55.00, or 1.2 CEU for \$50.00

Please send registration form and check to:
Summit County 4-H Council Club
P.O. Box 5660
Frisco, CO 80443
970-668-4142

Registration and payment due by February 24, 2012

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STEMaster Trainer Bios

Dr. Barbara J. Shaw

Barbara Shaw is the Western Region STEM Specialist. She earned her Ph.D. in biology from Portland State University and taught for Department of Geology, School of Education, and University Studies as adjunct faculty. She worked for over 30 years in science education, providing professional development to ~10,000 teachers and taught ~50,000 students from pre-K to graduate college students. Her research includes the evolution and locomotion of tree and ground sloths, armadillos, anteaters, and glyptodonts, as well as how K-12 students understand and use scientific process. She was an NSF Fellow, NSF honoree, received Sigma Xi Award for research, the prestigious Colbert Award in paleontology, and teaching awards at Portland State University.

Anne Casey

Anne Casey is the Regional STEM Specialist for Southern Colorado. She has an undergraduate degree in Material Science and Engineering from MIT and a Masters of Environmental Science from the University of Maryland. After working in industry as a semi-conductor engineer with IBM, she started teaching children science and math in a variety of settings from afterschool clubs and museum programs to public school. She was a classroom teacher for over 15 years before she joined CSU Extension.

Claire Dixon

Claire Dixon is the Front Range STEM Specialist based in Golden, Colorado. She holds a Bachelor of Biological Sciences with minors in Chemistry and Political Science and a Masters of Business Administration from the University of Denver. Claire works to bring 4-H STEM to new communities with various projects such as robotics, videography, animal science and much more. She has presented at national conferences and led statewide educator trainings. She is an eleven year alumnus of Colorado 4-H.

Dale A. Leidheiser

Dale Leidheiser is an Extension Specialist in 4-H Youth Development, and has been a youth development professional for over 30 years. As an Extension Specialist, he supports educational programming and training in the areas of volunteer development, leadership development, and community development. With over 11,000 volunteers in the Colorado 4-H program there are opportunities and challenges to build the capacity of this workforce to assist in the delivery of high quality positive youth development programs.

Dr. Heidi Iverson

Dr. Heidi Iverson is a Postdoctoral Researcher in the new Colorado State University STEM Center. She holds a B.S. degree in Geology from the University of California Davis, a M.S. degree in Geophysics from Washington University in St. Louis, and a Ph.D. in Science Education from the University of Colorado Boulder. Her current research interests center around innovative approaches to teaching in the college environment, specifically in physics education, and more broadly on innovative approaches to assessment and instruction in science education.

Dr. Karl Topper

Dr. Karl Topper is a teacher at Dillon Valley Elementary School and has over 18 years of teaching experience at the elementary to college levels. He has taught environmental science and teacher education, and is currently writing a science education textbook and developing professional development training focused on supporting elementary teachers' capacity to teach science.

Christy Fitzpatrick

Christy Fitzpatrick is the Regional STEM Specialist for Northeastern Colorado, based in Sterling. She earned her undergraduate degree in Biology and Food Science and her Masters in Science Education, both from the University of Maine. She was a county 4-H agent in Maine for 13 years and also has experience as a public school teacher and a trainer of teachers.

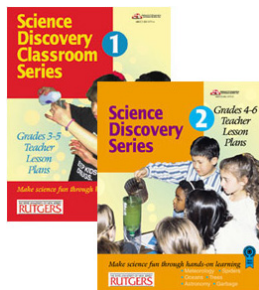


Robotics

- Virtual Track DVD
- Junk Drawer Robotics Series (3 Books)
- 1 Youth Notebook
- Robotics Platforms DVD
- Gear Tech 21 – online program



National 4-H has a mandate to increase the number of STEM graduates in an initiative of One Million New Scientists; One Million New Ideas. Robotics is one of the major programs developed and supported in an effort to meet that mandate. In this module, you will gain comfort and experience in the 4-H world of robotics by constructing and programming LEGO's Mindstorms NXT robots as well as design, operate, and test junk drawer robots built from everyday objects without the use of computers. You will discuss safety issues and the uses of robotics in our modern world. There are 5 major fields of robotics (human—robot interface, mobility, manipulation, programming, sensors), and you examine how each of those can be five fields can be developed into themes for your own students. You will gain insights on how to best present the design, building, and testing of robots to youth, as well as discuss the opportunities for youth to demonstrate their skills. Recordkeeping is one of the most important skills in science and engineering, and this program is built on the engineering notebook and essential records of the scientist. You will examine robotics competitions as part of your programs, and include career opportunity exploration in robotics and STEM for your youth. When you have completed this robotics module, you will have the tools to develop and present a rich and robust robotics experience for your participants.



Science 101

- Science Discovery Classroom Series 1
- Science Discovery Series 2
- Project Butterfly Wings (including facilitator guide)

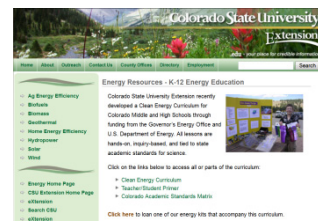


This module will start from the very beginning and take you step by step through the process of teaching fun, solid, and rich science. We will examine the three major branches of science: physical science (physics and chemistry), Earth/space science (geology, meteorology, oceanography, and astronomy), and life science (microbiology, diversity and evolution, and physiology) and engage in activities that explore these different areas. You will gain experience in working within the framework of science, and find the fascination and wonder in our natural world as viewed through a scientist's eyes so that you can share this wonder with your students. Project Butterfly Wing is a citizen scientist project, tracking common and rare butterfly distribution throughout the United States. Youth learn about butterflies, find and record the butterflies in Summit County, and then share their data with scientists in Florida. Bob Hammon, CSU Extension Entomologist will consult in this project.

Energy

- Power of the Wind (including facilitator guide)
- Electricity Series (including facilitator guide)
- Colorado Clean Energy

Energy is the single most important factor in modern life. The quality of our lives is dependent on the availability of energy. Without energy, people struggle to find clean water, preserve and cook food, and wash clothes or themselves. Energy in the United States is cheap, and we have an abundance of natural resources to extract energy. To better understand energy, the 4-H Electricity Project will demonstrate how electricity works from very simple circuits to complex circuitry. Youth will diagram and experiment to conclude how it works. Energy has a hidden cost, which we are just beginning to see. Using energy causes harm to our environment. Coal burning electrical plants on the East Coast are a direct cause of acid rain. Nuclear power plants generate enormous amount of heat and are altering the temperatures of bodies of water in Florida. Air pollution is common in big cities from exhaust of cars, trucks, and buses. In an effort to reduce the negative impact from producing energy, people are beginning to find clean energy alternatives. The Power of the Wind and Colorado State University Extensions very own Colorado Clean Energy Curriculum examine both different types of alternative energy, but also provide students with the tools to analyze and interpret data, evaluating easy steps to reduce our need for costly energy.



Environment

- Exploring Your Environment: Earth's Capacity
- Exploring Your Environment: Ecosystems Services
 - Exploring Your Environment: Facilitator Guide
- There's No New Water
- Forestry Series including Facilitator Guide
- The Cornell Lab of Ornithology - online

Environmental issues today can be frightening to youth. They hear about global warming, water pollution, plastic trash islands in the middle of the Pacific Ocean, endangered species, and so much more. This module utilizes the 4-H National Curricula focusing on environmental issues that provide youth the capacity to appraise the issues as well as devise solutions to make a difference. Earth's Capacity focuses on environmental stewardship and issues such as transportation choices, waste management, composting, recycling, and natural resources. and Exploring Your Environment - Ecosystems Service youth will engage in hands-on activities that focus on our ecosystems, climate change, life cycles, ecological footprints, and living a sustainable life. 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 Cornell Lab of Ornithology – Bird Sleuth Investigating Evidence online program is a citizen scientist project that students can collect, analyze, interpret, and share their data to make a difference.





Summit County 4-H STEMaster Training

Friday, March 9

5:30 - 9:30 p.m.

Senior/Community Center
0083 Nancy's Place/CR 1014
Frisco, CO 80443

Saturday, March 10

8:00 a.m. - 5:00 p.m.

6:00 p.m. - 9:00 p.m. - Graduate Credit
(optional)

Summit Middle School
158 Summit School Road
Frisco, CO 80443

Summit County 4-H: 970-668-4142
[www.extension.colostate.edu/
summit/4hy.shtml](http://www.extension.colostate.edu/summit/4hy.shtml)



Summit County 4-H Robotics Club, Mr. Holdman -
4-H Volunteer Leader

*Colorado State University Extension, U.S. Department of
Agriculture and Colorado counties cooperating. Extension
programs are available to all without discrimination.*

March 2009

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Communications 2012

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