



# 4-H SCIENTIFIC LITERACY (STEM) PROJECT



Youth need to understand science, technology, engineering, and mathematics (STEM) concepts and know how to use scientific and engineering thinking to address important societal concerns. The 4-H scientific literacy project introduces 4-H members to important concepts through engaging in reasoning skills to help improve attitudes for and interest in STEM. Through this project, youth apply their learning to real-world issues.

- Youth develop science-related conceptual understanding associated with issues relevant to their respective 4-H projects, their own lives, and to the citizens of California.
- Youth strengthen their scientific reasoning, the cognitive skills needed to understand and evaluate scientific information.
- Youth apply their knowledge and skills to real-world problems to gain a deeper understanding of STEM.

## Starting Out *Beginner*

- Spark young people's interest in STEM through hands-on and experiential activities.
- Focus on engaging youth in science process skills, such as observing, communicating, comparing, ordering, categorizing, relating, inferring, applying.
- Visit science centers, museums, and other science-related places.
- Invite a scientist or engineering to speak.

## Learning More *Intermediate*

- Deepen young people's interest in STEM through longer-term projects where they can ask questions, plan and carry out investigations, analyze and interpret data, construct explanations, and communicate information.
- Invite youth to use scientific and engineering tools.
- Use scientific and engineering terms and concepts.

## Exploring Depth *Advanced*

- Sustain young people's STEM interest with scientific investigations and engineering design.
- Engage in a citizen science project.
- Explore community issues, design and implement a scientific exploration to address relevant questions.
- Facilitate hands-on STEM activities with younger youth.

The activities above are ideas to inspire further project development. This is not a complete list.

## 4-H THRIVE

### Help Youth:

#### Light Their Spark

A spark is something youth are passionate about; it really fires them up and gives them joy and energy. Help youth find how this project excites them.

#### Flex Their Brain

The brain grows stronger when we try new things and master new skills. Encourage youth effort and persistence to help them reach higher levels of success.

#### Reach Their Goals

Help youth use the GPS system to achieve their goals.

- Goal Selection:** Choose one meaningful, realistic and demanding goal.
- Pursue Strategies:** Create a step-by-step plan to make daily choices that support your goal.
- Shift Gears:** Change strategies if you're having difficulties reaching your goal. Seek help from others. What are youth going to do when things get in their way?

#### Reflect

Ask project members how they can use their passion for this project to be more confident, competent and caring. Discuss ways they can use their skills to make a contribution in the community, improve their character or establish connections.



# Expand Your Experiences!

## Science, Technology, Engineering, and Mathematics

- Explore the history and development of a scientific tool or theory
- Hold a townhall-style debate on a socioscientific issue (like climate change) where each person represents a stakeholder group (engaging in argumentation from evidence)
- Learn about scientific norms—like C.U.D.O.S.

## Healthy Living

- Find ways to use science or engineering to improve the health of your community
- Research how scientific advancements have helped improve our standard of living
- Coordinate a GIS project to map local sources of fresh fruits and vegetables

## Citizenship

- Discover the science-rich institutions in your community. Find methods to increase youth participation in interacting with these places
- Identify community needs and plan a scientific investigation or engineering design to address the issue

## Leadership

- Become a junior or teen leader
- Plan, prepare, and present a Science or Engineering Presentation at a 4-H presentation day
- Lead a 4-H National Youth Science Day event in your community- [www.4-H.org/NYSD](http://www.4-H.org/NYSD)

## Resources

- 4-H STEM Resources  
[4h.ucanr.edu/Projects/STEM/Professional\\_Development/](http://4h.ucanr.edu/Projects/STEM/Professional_Development/)
- Understanding Science  
<http://undsci.berkeley.edu/>
- How to Smile  
[www.howtosmile.org/](http://www.howtosmile.org/)
- 50 Ways to include STEM in service learning  
[4h.ucanr.edu/files/117133.pdf](http://4h.ucanr.edu/files/117133.pdf)
- USA Science and Engineering Festival  
[www.usasciencefestival.org/](http://www.usasciencefestival.org/)
- Exploratorium Education  
<http://www.exploratorium.edu/>
- SciGirls  
<http://pbskids.org/scigirls/home>
- Citizen Science  
[CitizenScience.org](http://CitizenScience.org)
- Click2Science Resources  
<http://www.click2sciencepd.org/>
- Techbridge  
<http://www.techbridgegirls.org/>
- ScienceFriday  
<http://www.sciencefriday.com/>
- Science Buddies  
<http://www.sciencebuddies.org/>

### Connections & Events

### Curriculum

### 4-H Record Book

**Apply for a 4-H Golden Clover Award in the Brownlee Science category.**

**Presentation Days** – Share what you’ve learned with others through a presentation. Present a Science or Engineering Presentation.

**Field Days** – At these events, 4-H members may participate in a variety of contests related to their project area. Contact your county 4-H office to determine additional opportunities.

- For K-3rd grade youth: Youth Experiences in Science- [http://4h.ucanr.edu/Resources/Curriculum/FREE/4-H\\_Youth\\_Experiences\\_in\\_Science\\_2000/](http://4h.ucanr.edu/Resources/Curriculum/FREE/4-H_Youth_Experiences_in_Science_2000/)
- There’s No New Water! <http://www.4-h.org/resource-library/curriculum/4-h-theres-no-new-water/>
- Explore It! Curriculum <http://npass2.edc.org/curriculum>

4-H Record Books give members an opportunity to record events and reflect on their experiences. For each project, members document their experiences, learning and development.

4-H Record Books also teach members record management skills and encourage them to set goals and develop a plan to meet those goals.

To access the 4-H Record Book online, visit <http://ucanr.edu/orb/>

The UC 4-H Youth Development Program does not endorse, warrant, or otherwise take responsibility for the contents of unofficial sites.



**University of California** Agriculture and Natural Resources

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