Title
4-H Scientific Literacy Project

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Authors
Borba, John
Diaz, Claudia
Horowitz, Marcel
et al.

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**4-H SCIENTIFIC LITERACY 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.

### 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.

<table>
<thead>
<tr>
<th>Starting Out Beginner</th>
<th>Learning More Intermediate</th>
<th>Exploring Depth Advanced</th>
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<tbody>
<tr>
<td>Spark young people’s interest in STEM through hands-on and experiential activities.</td>
<td>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.</td>
<td>Sustain young people’s STEM interest with scientific investigations and engineering design.</td>
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<tr>
<td>Focus on engaging youth in science process skills, such as observing, communicating, comparing, ordering, categorizing, relating, inferring, applying.</td>
<td>Invite youth to use scientific and engineering tools.</td>
<td>Engage in a citizen science project.</td>
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<tr>
<td>Visit science centers, museums, and other science-related places.</td>
<td>Use scientific and engineering terms and concepts.</td>
<td>Explore community issues; design and implement a scientific exploration to address relevant questions.</td>
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<td>Invite a scientist or engineer to speak.</td>
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<td>Facilitate hands-on STEM activities with younger youth.</td>
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</tbody>
</table>

The activities above are ideas to inspire further project development. This is not a complete list.
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 socio-scientific 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/NYSYD.

Connections & Events

- 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.
- Field Days – 4-H members may participate in a variety of contests related to their project area.
- Contact your UC Cooperative Extension office to determine additional opportunities available, such as a field day.

Curriculum

- For K-3rd grade youth: Youth Experiences in Science: 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 Book

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/

University of California Agriculture and Natural Resources

Resources

- 4-H STEM Resources 4h.ucanr.edu/Projects/STEM/Professional_Development/
- Understanding Science http://undsci.berkeley.edu/
- How to Smile www.howtosmile.org/
- 50 Ways to Include STEM in Service Learning 4h.ucanr.edu/files/117133.pdf
- USA Science and Engineering Festival www.usasciencefestival.org/
- Exploratorium Education http://www.exploratorium.edu/
- SciGirls http://pbskids.org/scigirls/home
- Citizen Science CitizenScience.org
- Click2Science Resources http://www.click2sciencepd.org/
- Techbridge http://www.techbridgegirls.org/
- ScienceFriday http://www.sciencefriday.com/
- Science Buddies http://www.sciencebuddies.org/

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University of California
Agriculture and Natural Resources
Communication Services
2801 Second Street
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Telephone 1-800-994-8849
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California 4-H Project Sheet Series Authors

JOHN BORBA, 4-H Youth Development Advisor, UC Cooperative Extension, Kern County; CLAUDIA DIAZ, 4-H Youth Development Advisor, UC Cooperative Extension, Riverside and San Bernardino counties; MARCEL HOROWITZ, Healthy Youth, Families, and Communities Advisor, UC Cooperative Extension, Yolo County; ANNE IACCOPUCCI, 4-H Healthy Living Academic Coordinator, California State 4-H Office; SHANNON KLYSCH; UC CalFresh Community Education Supervisor, UC Cooperative Extension, San Luis Obispo County; KENDRA LEWIS, 4-H Evaluation Academic Coordinator, California State 4-H Office; KATHERINE SOULE, Youth, Families, and Communities Advisor and Director of UC Cooperative Extension, San Luis Obispo and Santa Barbara Counties; and STEVEN WORKER, 4-H Youth Development Advisor, UC Cooperative Extension, Marin, Napa, and Sonoma counties.