4-H SCIENCE
3,500 4-H Educators
532,312 Volunteers

3,068 Counties
109 LGUs

Total Enrollment: 6,330,612

Male: 3,049,525
Female: 3,281,525
Content and Context
4-H Youth Solution

4-H PYD Inputs

- Skill-Building
- 4-H Positive Youth Development
- Long-Term Caring Adult

Meaningful Leadership

Outcomes

- Competence
- Confidence
- Connected
- Caring
- Character

Impact

Contribution

4-H Impact
Content and Context

4-H SCIENCE since 1902
A Strategic Focus on STEM
Alternative Energy
Biotechnology and Plant Sciences
Engineering and Technology
Environmental Sciences
Geospatial Technologies
Robotics
Rocketry
4-H Program Delivery Modes

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-H Clubs</td>
<td>1.7 million</td>
</tr>
<tr>
<td>4-H Camps/Summer</td>
<td>475,000</td>
</tr>
<tr>
<td>4-H Afterschool Groups</td>
<td>400,000</td>
</tr>
<tr>
<td>4-H School Enrichment Programs</td>
<td>3.4 million</td>
</tr>
</tbody>
</table>
4-H Science National Infrastructure

National Management Team
Regional Science Teams
LGU 4-H Science Liaisons
LGU 4-H Science Plans of Action
County Programs

4-H Science Logic Model
4-H Science Checklist
### Program Design

#### Situation
- **Description of challenge, problem, or opportunity:**
  - Unresolved worldwide social problems need to be addressed by science.
  - In the US, shortage of scientists and engineers understanding science.
  - Underrepresentation of women and minorities in science careers.
  - Need a diverse pool of trained scientists to frame and solve problems and educate others.
  - General population in the US (and worldwide) lacks basic understanding of science methods and content ("science literacy").

#### Inputs
- **What we invest:**
  - Federal, state, and private funds
  - 4-H Infrastructure
  - Land Grant Univ. Support
  - County Extension administrators and agents, program coordinators, and specialists
  - Training
  - Knowledge
  - Collaborations with external researchers
  - Collaborations with science industry leaders

#### Activities
- **What we do:**
  - Select and develop 4-H Science curriculum
  - Select and train volunteers
  - Market 4-H Science to increase interest, participation
  - Conduct non-formal education (learning and teaching, facilitated inquiry and discovery)
  - Facilitate question formation and problem solving through guided activities
  - Provide supplemental math programming
  - Teach youth about academic and career choices, requirements
  - Who we reach (Participation):
    - Extension administrators, LSU and Extension faculty and staff
    - Youth (grades 3-6, 6-9, 9-12)
    - Federal, state & private funders
    - Partners
    - Public

#### Outputs
- **What we produce:**
  - 4-H Science curricula
  - New instructional methods
  - Trained staff and volunteers
  - Adult participants engaged
  - Youth participants engaged
  - Partners (other Federal agencies, science museums, youth organizations, etc.) collaborating
  - Marketing materials
  - Evaluation materials

#### Outcomes
- **Knowledge**
  - Increased engagement in science among youth
  - Improved attitudes toward science among youth
  - Increased awareness of science among youth
- **Actions**
  - Youth apply science learning to contexts outside 4-H (e.g., school classes, science fairs, invention contests, etc.)
  - Youth adopt and use new methods or improve technology
  - Youth demonstrate use of life skills
  - Youth express interests and demonstrate aspirations toward science careers (career fairs, job shadowing, volunteer work or internships)
  - Youth raise questions and identify problems to be addressed using science
- **Conditions**
  - Occurs when there is a change in behavior of the participants from what they've learned and gained.
  - Occurs when there is a change in behavior or the participants act upon what they've learned and gained.
  - Occur when a societal condition is improved due to a participants action taken in the previous column.

#### “I like to do this.”
- Increased number and more diverse pool of youth pursuing education and careers in science-related fields.
- Increased and more diverse pool of trained teachers, educators, scientists.
- Increased science literacy in general population.
- Increased innovation addressing social problems using science.
Program Design

“I can do this.”

**Situation**
- Description of challenge, problem, or opportunity:
  - Unsolved worldwide social problems need to be addressed by science.
  - In the US, shortage of scientists & people understanding science.
  - Under-representation of women and minorities in science careers.
  - Need a diverse pool of trained scientists to frame and solve problems & educate others.
  - General population in the US (8 worldwide) lacks basic understanding of science methods and content (‘science literacy’).

**Inputs**
- What we invest:
  - Federal, state and private funds
  - 4-H infrastructure
  - Land Grant Univ. Support
  - County Extension administrators and agents, program coordinators, and specialists
  - Training
  - Knowledge
  - Collaborations with external researchers
  - Collaborations with science industry leaders

**Activities**
- What we do:
  - Select and develop 4-H Science curricula
  - Select and train volunteers
  - Market 4-H Science to increase interest, participation
  - Conduct non-formal education (learning and teaching, facilitated inquiry and discovery)
  - Facilitate question formation and problem solving through guided activities
  - Provide or supplement math programming
  - Teach youth about academic and career choices, recruitment
  - Who we reach (Participation):
    - Extension administrators, LSU and Extension faculty and staff
    - Youth (grades 3-6, 7-9, 9-13)
    - Federal, state & private funders
    - Partners
    - Public

**Outputs**
- What we produce:
  - 4-H Science curricula
  - New instructional methods
  - Trained staff and volunteers
  - Adult participants engaged
  - Youth participants engaged

**Program Design**

**Outcomes**
- Occurs when there is a change in knowledge or the participants learn:
  - Increased engagement in science among youth
  - Improved attitudes toward science among youth
  - Increased awareness of science among youth

**Knowledge**
- Increased science skills (scientific methods) and knowledge (content areas) among youth
- Increased awareness of opportunities to contribute to society using science skills.
- Increased life skills

**Actions**
- Youth adopt and use new methods or improved technology
- Youth demonstrate use of life skills

**Conditions**
- Occurs when a societal condition is improved due to a participant’s action taken in the previous column.
  - Increased number and more diverse pool of youth pursuing education and careers in science related fields.
  - Increased and more diverse pool of trained teachers, educators, scientists
  - Increased science literacy in general population
  - Increased innovation addressing social problems using science.
## Program Design

### Situation

- **Description of challenge, problem, or opportunity:**
  - Unsolved worldwide social problems need to be addressed by science.
  - In the US, shortage of scientists & people understanding science.
  - Under-representation of women and minorities in science careers.
  - Need a diverse pool of trained scientists to frame and solve problems & educate others.
  - General population in the US (differently) lacks basic understanding of science methods and content ("science literacy").

### Inputs

- What we invest:
  - Federal, state and private funds
  - 4-H infrastructure
  - County Extension administrators and agents.
  - Program coordinators, and specialists.
  - Training.
  - Knowledge.
  - Collaborations with external researchers
  - Collaborations with science industry leaders.

### Activities

- What we do:
  - Select and develop 4-H Science curricula.
  - Select and train volunteers.
  - Market 4-H Science to increase interest, participation.
  - Conduct non-formal education (learning and teaching, facilitated inquiry and discovery).
  - Facilitate question formation and problem solving through guided activities.
  - Provide or supplement math programming.
  - Teach youth about academic and career choices, recruitment.

### Outputs

- What we produce:
  - 4-H Science curricula.
  - New instructional methods.
  - Trained staff and volunteers.
  - Adult participants engaged.
  - Youth participants engaged.
  - Partners (Other Federal agencies, science museums, youth organizations, etc.) collaborating.
  - Marketing materials.
  - Evaluation materials.

### Knowledge

- Occurs when there is a change in knowledge or the participants learn:
  - Increased engagement in science among youth.
  - Improved attitudes toward science among youth.
  - Increased awareness of science among youth.
  - Improved science skills (scientific methods and knowledge/content areas) among youth.

### Actions

- Occur when there is a change in behavior or the participants act upon what they’ve learned and:
  - Youth apply science learning to contexts outside 4-H (e.g., school classes, science fairs, invention contests, etc.).
  - Youth adopt and use new methods or improved technology.
  - Youth demonstrate use of life skills.

### Conditions

- Occur when a societal condition is improved due to a participant's action taken in the previous column:
  - Increased number and more diverse pool of youth pursuing education and careers in science related fields.
  - Increased and more diverse pool of trained teachers, educators, scientists.
  - Increased science literacy in general population.
  - Increased innovation addressing social problems using science.

### “This is important to me.”

- Youth express interest in science careers.
- Youth express careers in science careers.
- Youth express interest in science careers.
- Youth express interest in science careers.
- Youth express interest in science careers.
- Youth express interest in science careers.
4-H Science Outcomes

• Interest and engagement in Science
• Develop Science skills and abilities
• Positive attitudes and aspirations toward Science
• Apply learning, make a contribution through Science
“Science Ready” Checklist

- Next Generation Science Standards
- 4-H Science Abilities
- Essential Elements of PYD
- Trained, Caring Adult as Co-Learner
- Experiential Approach to Learning
- Inquiry Approach to Learning
- Frequency and Duration

4-H SCIENCE

high quality STEM programming
4-H Science Professional Development

- 4-H Science Logic Model
- 4-H “Science Ready” Checklist
- 4-H Science 101 Guide
- 4-H Science Competencies
- Self-Assessment
- Inquiry Based Learning
- Experiential Learning
- Promising Practices
- 4-H Science Academies – National, Regional, e-Academy
Additional 4-H Science Strategies

• National Youth Science Day
• National Youth STEM Summits
• Continued Focus on Underrepresented and Underserved Youth
• New Models of Volunteerism
• Increased Collaboration with other National Youth Organizations
4-H SCIENCE

THANK YOU

FOR MORE INFORMATION
http://www.4-h.org/resource-library/professional-development-learning/science-training-guides-resources/
http://www.4-h.org/about/youth-development-research/science-program-research/

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www.4-H.org