SCIENCE
4-H COMMON MEASURES REPORT
2017-18

University of California
Agriculture and Natural Resources 4-H Youth Development Program
Introduction

4-H learning experiences are based on the principles and practices of Positive Youth Development. The structured learning, encouragement, and adult mentoring that young people receive through their participation in 4-H plays a vital role in helping them achieve future life success. Positive Youth Development views young people as vital resources with assets and potentials to be developed rather than as problems to be managed. 4-H staff and volunteers intentionally address youths' basic needs by intentionally integrating elements within 4-H experiences that create environments conducive to optimizing youth development.

This report summarizes the impact of our 4-H Positive Youth Development programs on our youth.

Participants’ 4-H Experience

974 youth completed the Science survey during the 2017-18 program year. Youth were between the ages of 9 and 18, with the average age being 12.37 years (standard deviation= 2.43 years). The average number of years in 4-H was 4.03 (standard deviation= 2.63). The sample was 66% female and 34% male. The racial breakdown of the sample was: 77% White, 1% African American, 3% Asian, 2% Native American, 0.5% Pacific Islander, 8% Multiple, and 7% Undetermined. 21% of youth were Hispanic. Youth lived in farm (21%), rural (22%), town (21%), suburb (21%), and city (15%) areas.

Youth were asked a number of questions about what they may have learned during this program. Results are shown in the figures that follow. These results are based on youth who had permission to use their data. (Percentages may add up to 99% or 101% due to rounding.)

Science Interest and Thinking

<table>
<thead>
<tr>
<th>Are you interested in learning about animal science?</th>
<th>Are you interested in learning about plant science?</th>
<th>Are you interested in learning about environmental science?</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="chart1.png" alt="Bar chart" /></td>
<td><img src="chart2.png" alt="Bar chart" /></td>
<td><img src="chart3.png" alt="Bar chart" /></td>
</tr>
<tr>
<td>Are you interested in learning about animal science?</td>
<td>Are you interested in learning about plant science?</td>
<td>Are you interested in learning about environmental science?</td>
</tr>
</tbody>
</table>
Are you interested in learning about robotics?

- 16% No
- 27% Not really
- 17% Usually
- 40% Yes

Are you interested in learning about engineering?

- 14% No
- 23% Not really
- 19% Usually
- 44% Yes

How much do you like science?

- 4% Not at all
- 39% A little
- 57% A lot

How much you like engineering?

- 19% Not at all
- 47% A little
- 34% A lot

Would you like a job in science?

- 31% No
- 39% Sort of
- 30% Yes

Would you like a job that uses engineering?

- 2% No
- 10% Sort of
- 30% Yes

Do you ask questions about how things work?

- 2% No
- 10% Not really
- 30% Usually
- 58% Yes

Do you try new things to see how they will work?

- 3% No
- 10% Not really
- 31% Usually
- 56% Yes

Do you look at how things are the same or different?

- 3% No
- 14% Not really
- 32% Usually
- 51% Yes
Do you compare how different things work?

- Percent of Youth: 5% No, 18% Not really, 31% Usually, 46% Yes

Do you take things apart to see how they work?

- Percent of Youth: 17% No, 30% Not really, 21% Usually, 32% Yes

Do you come up with ideas for how to build new things?

- Percent of Youth: 10% No, 24% Not really, 22% Usually, 44% Yes

At 4-H, did you learn new things about science?

- Percent of Youth: 22% No, 35% Sort of, 43% Yes

At 4-H, did you learn new things about engineering?

- Percent of Youth: 47% No, 33% Sort of, 20% Yes

At 4-H, did you talk about how science can be used to help solve everyday problems?

- Percent of Youth: 41% No, 35% Sort of, 24% Yes

Have you shared your science-related projects with others?

- Percent of Youth: 43% No, 26% Sort of, 31% Yes
Science Skills and Attitudes (Grades 8 to 12 only)

Do you know how to ask a hypothesis that can be tested?

- No: 17%
- Sort of: 18%
- Yes: 65%

Do you know how to plan an experiment?

- No: 14%
- Sort of: 18%
- Yes: 68%

Do you know how to analyze data to draw conclusions about a hypothesis?

- No: 15%
- Sort of: 21%
- Yes: 64%

Do you know how to communicate the results of an experiment to others?

- No: 15%
- Sort of: 22%
- Yes: 63%

I like science

- No: 3%
- Not really: 14%
- Usually: 44%
- Yes: 39%

I would like a job that involves using science

- No: 7%
- Not really: 21%
- Usually: 39%
- Yes: 33%
Engineering Skills and Attitudes (Grades 8 to 12 only)

Do you know how to define an engineering design problem?

- No: 45%
- Sort of: 33%
- Yes: 22%

Do you know how to identify potential solutions to a design problem?

- No: 35%
- Sort of: 38%
- Yes: 27%

Do you know how to evaluate test results to identify the best solution?

- No: 28%
- Sort of: 35%
- Yes: 37%
Conclusion

Youth-driven 4-H experiences provide young people access to safe learning environments; challenging experiences that build skills, competencies, and resiliency to address life's challenges and to actively contribute to society; and partnerships with caring adults to help meet youths' basic needs of belonging, mastery, independence, and generosity. Youth who participate in 4-H report better grades, higher levels of academic competence, and an elevated level of engagement at school. They are also nearly two times more likely to plan to go to college. The structured learning, encouragement and adult mentoring that young people receive through their participation in 4-H plays a vital role in helping them achieve future life successes.