



## EVALUATING THE 4-H SCIENCE INITIATIVE:

*Youth, Engagement, Attitudes, and  
Knowledge Survey Results – Year 3*

# INTRODUCTION

The 4-H Youth Development Program, with support from the Noyce Foundation, began the 4-H Science Initiative with the goals of engaging more young people in science-related fields and increasing the number of youth pursuing higher education and careers in STEM. The Youth Engagement, Attitudes, and Knowledge (YEAK) study provides insight into the population served by 4-H Science programs, their experiences, their attitudes toward science and related fields, how they engage in science in their communities, and their aspirations. While the Year 3 YEAK findings reflect a sample of youth participating in 4-H, they also contribute to the national dialogue on science education in other informal learning environments.

## METHODOLOGIES

For this third administration, the evaluation team made substantial changes in the survey sampling methods. By using the ACCESS 4-H Online Management System, evaluators were able to create a random sample of 4-H Science programs to participate in the study. This is noteworthy as it allowed for the collection of data from a more complete list of programs. The programs sampled for 2013 were more likely to be traditional clubs, in contrast to high-profile programs sampled in previous years.

## THE SAMPLE

A total of 418 youth, from 38 clubs, ranging from 9 to 18 years of age completed this year's survey. Sixty-six percent of responding participants were between the ages of 9 and 12. Females comprised the majority of the sample with 56%. The survey's program-level response rate was 75%, and the youth-level response rate was 61% in programs returning surveys. Seventy-six percent of survey respondents reported their race or ethnicity as white, 19% as African American, 4% as Native American, 3% as other, 2% as Hispanic/Latino, 2% as Asian, and less than 1% as Native Hawaiian/Other Pacific Islander. A small percentage of youth selected more than one race/ethnicity.

## LENGTH OF TIME AS A 4-H MEMBER

- 31% reported this was their second year in 4-H
- 43% reported that they had been in 4-H for three or more years
- 27% reported they were new to 4-H

## EXPOSURE TO 4-H SCIENCE

To measure intensity and dosage, 4-H Youth were asked to report their length of involvement in 4-H Science programs and how many hours per week they spend in this program.

- 24% of youth were classified as high exposure and reported participating in their program for the greatest number of hours and months (at least 1 hour or more per week for 5 or more months)
- 20% of youth were classified as moderate exposure and participated in their program for fewer hours per week and for fewer months (1 hour or less per week over 5 or more months, or 1 or more hours per week over 2-4 months)
- 56% of youth were classified as low exposure and reported participating in their program the least (less than 3 hours per week over 4 or fewer months)



# SUMMARY OF 4-H SCIENCE YEAR STUDY FINDINGS<sup>1</sup>

## SCIENCE PROGRAM ENVIRONMENT AND BENEFITS

- 95% agreed that all kinds of kids were welcome in their program
- 89% reported that they feel safe and respected in their programs
- 79% reported that they feel like they can make a difference

## FAVORITE CHARACTERISTICS OF THIS SCIENCE PROGRAM

- 66% said getting to do hands-on science activities and projects
- 57% said getting to spend time with friends
- 32% said the adults are caring and kind

## PARTICIPATION IN COMMUNITY SCIENCE ACTIVITIES

- 69% helped with a community service project that relates to science
- 51% taught others about science
- 27% used science tools to help the community
- 26% organized or led science-related events

## NOYCE ENTHUSIASM FOR SCIENCE

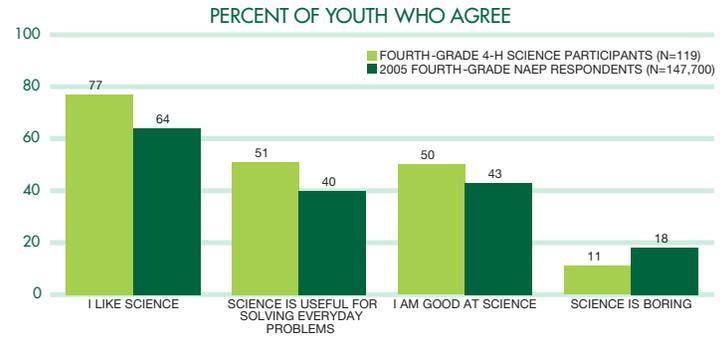
In order to begin building a broad set of data on interest in science among youth enrolled in nonformal science education programs, the Noyce Foundation partnered with evaluation specialists and Foundation grantees to develop a set of youth survey items that measure youths' enthusiasm for science

- 85% of respondents like to see how things are made
- 84% like to participate in science projects
- 77% get excited learning about new discoveries or inventions

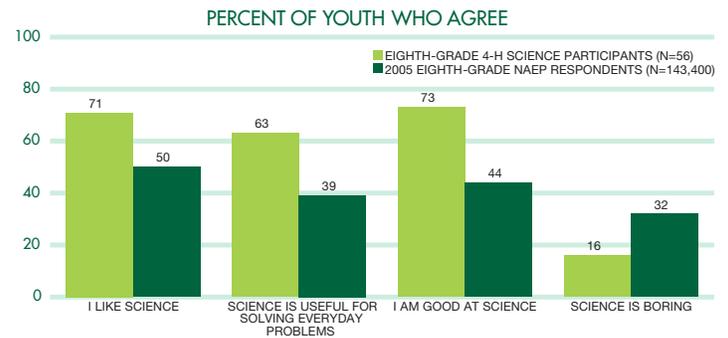
## LIFE SKILLS

- 45% always and 34% usually think before making a choice
- 38% always and 34% usually think of past choices when making new decisions
- 41% always and 35% usually keep their mind open to different ideas when planning to make a decision;
- 42% always and 36% usually first figure out exactly what the problem is

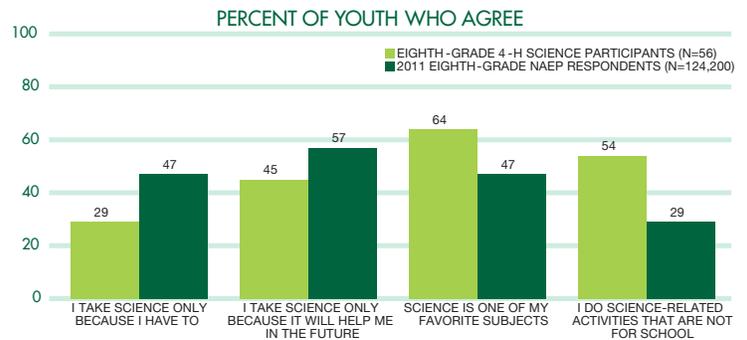
## FOURTH-GRADE 4-H SCIENCE AND 2005 NAEP RESPONDENT ATTITUDES TOWARD SCIENCE, IN PERCENTS



## EIGHTH-GRADE 4-H SCIENCE AND 2005 NAEP RESPONDENT ATTITUDES TOWARD SCIENCE, IN PERCENTS



## EIGHTH-GRADE 4-H SCIENCE AND 2011 NAEP RESPONDENT ATTITUDES TOWARD SCIENCE, IN PERCENTS



## TWELFTH-GRADE 4-H SCIENCE AND 2009 NAEP RESPONDENT ATTITUDES TOWARD SCIENCE, IN PERCENTS

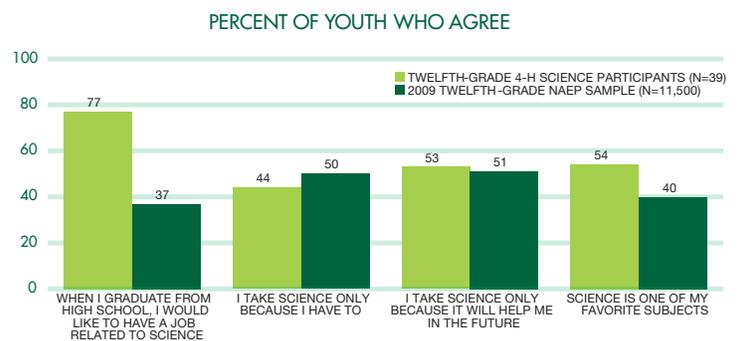


Exhibit reads: Seventy-seven percent of fourth-grade 4-H Science participants agreed that they like science compared to 64 percent of 2005 fourth-grade NAEP respondents.

Comparisons against a national sample: While the differences between the 4-H Science participants and the NAEP respondents are encouraging, these differences should be interpreted with caution and should be interpreted as anecdotal evidence of the level of interest that 4-H Science participants have in science.

<sup>1</sup> For information on the survey scales used in this study, please reference the full report found at 4-H.org – About/Research/Science

## SCIENCE PROCESS SKILLS

- 85% can make a chart or picture to show information (ages 9-12)
- 84% can do an experiment to answer a question (ages 9-12)
- 80% use the results of an investigation to answer the question that they had asked (ages 13-18)
- 75% use scientific knowledge to answer a question (ages 13-18)

## EDUCATIONAL AND CAREER ASPIRATIONS

- 59% want to finish college
- 24% want more education after college
- 59% would like a job related to science

## ASSOCIATIONS BETWEEN YOUTH CHARACTERISTICS AND YOUTH RESPONSES

- Youth in the high-exposure group gave higher average ratings to their decision making skills and gave higher average ratings of their program's benefits and opportunities compared to youth in the low-exposure group.
- On average, girls gave higher ratings to their 4-H program's climate than did boys.
- Older youth gave more positive evaluations of their decision making skills and gave higher ratings to the benefits and opportunities offered by their programs.
- Younger youth were more positive than were older youth on a scale measuring their enthusiasm about science.
- Youth who expected to have science careers gave higher average ratings of their decision-making skills, critical thinking skills, and problem solving skills.

# SUMMARY, YEARS 1-3

Overall, analyses showed that the attitudes that youth in the Year 3 sample held towards science, and the experiences they reported having in their programs, were similar to those of youth in past survey samples. This lends weight to the idea that the attitudes and experiences of youth in 4-H Science programs are similar across different types of 4-H programs – and among youth in both programs with greater or lesser visibility at the state and county levels.

Surveys of youth in 4-H Science programs from 2010 through 2013 have shown that the youth in these programs are enthusiastic about science, believe they have strong science and life skills, and enjoy the hands-on activities they do and the positive relationships they build through their 4-H programs.

Below are a few highlights comparing years one through three.

- Positive involvement in one's community remained an important tenet for 4-H across all three years of the study.
- In 2013, 59% said they would like to have a job related to science when they graduate from high school; 54% agreed or strongly agreed in 2011 and 50% in 2010.
- "I get to do hands-on science activities and projects," "I get to spend time with my friends," and "The adults are caring and kind" were the top three responses in each year of the evaluation.
- Life Skill and Science Process Skill responses were consistent across all three years.



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