EVALUATING THE 4-H SCIENCE INITIATIVE:
The 2010 Youth, Engagement, Attitudes and Knowledge Survey Results
INTRODUCTION/OVERVIEW

A RESPONSE TO THE NEED FOR FUTURE SCIENTISTS...

The 4-H Youth Development Program offers a solution to address the need for future scientists, engineers, mathematicians and technicians. 4-H Science, formerly called the 4-H Science, Engineering and Technology initiative, reaches more than 5 million youth with hands-on learning experiences to encourage young minds and to fill the pipeline of young leaders proficient in science.

Today, 4-H out-of-school opportunities focus on agricultural science, electricity, mechanics, natural sciences, rocketry, biofuels, renewable energy, computer sciences and more. The combination of content and context inherent in 4-H clubs, camps and 4-H afterschool is proven to have a positive effect on youth, resulting in young adults who are prepared to contribute, excel and lead in their communities and in the global workplace.

4-H IS AMERICA'S LARGEST YOUTH ORGANIZATION

Annually, nearly six million youth participate in 4-H, which is implemented by 109 Land-Grant Universities and Colleges (LGUs) in more than 3,000 counties as a part of the Cooperative Extension System. National leadership is provided by 4-H National Headquarters at the National Institute of Food and Agriculture, USDA, and National 4-H Council, which is the national non-profit partner of 4-H and the Cooperative Extension System. National 4-H Council focuses on fundraising, branding, communications, and legal and fiduciary support to 4-H programs.

With the support of the Noyce Foundation, National 4-H Council contracted with Policy Studies Associates (PSA) to evaluate the implementation of the 4-H Science Initiative using the 4-H Science Youth Engagement, Attitudes and Knowledge (YEAK) survey, a program evaluation tool developed in conjunction with the 4-H Science Instrument Design Team. The goals of the 4-H Science initiative are to increase the number and quality of science, engineering, technology and applied math programs that 4-H offers around the country, and to increase the number of youth involved in these programs. Objectives for the 4-H Science initiative are to increase science interest and literacy among youth, to increase the number of youth pursuing post-secondary education in science, and to increase the number of youth pursuing science careers.

According to the latest findings in the 4-H Science Youth Engagement, Attitudes and Knowledge (YEAK) survey, 4-H is capturing the attention and interest of our youth and encouraging their pursuit of post-secondary education and careers in the STEM fields. The 1,060 4-H youth surveyed are racially and geographically diverse. Nearly 90 percent of participants reported being enrolled in a public school, with the next largest group indicating that they are home schooled (7 percent). The participants surveyed included a slightly higher percentage of females (54 percent) than males (46 percent).

METHODOLOGY

The Youth Engagement, Attitudes and Knowledge (YEAK) survey is a self-report questionnaire. To measure participation, 4-H youth were asked to report the length of involvement in 4-H Science programs and how many hours per week they spend in this program/project? Youth who reported participating in their program for the greatest number of hours and months were categorized as “high exposure.” Youth who participated for fewer hours per week and for fewer months were categorized as “moderate exposure,” and youth who reported participating in their program the least were categorized as “low exposure.” Thirty percent of respondents were categorized as high exposure, 31 percent as moderate exposure, and 40 percent as low exposure.¹

SUMMARY OF 4-H SCIENCE YEAK STUDY FINDINGS

4-H YOUTH ATTITUDES TOWARDS SCIENCE

- More than 80 percent of respondents intend to finish college or continue to get more education after college.
- Fifty percent of respondents want to pursue a science career.
- Seventy-one percent of 4-H Science participants said science is one of their favorite subjects.
- Sixty-eight percent do science-related activities that are not for school work.
- Fifty-nine percent would like to have a job related to science when they graduate from school.

Comparison against a national sample. 4-H Science participants were separated by age into three groups and their responses were compared with those of 2005 National Assessment of Education Progress (NAEP) respondents of similar ages (Exhibits ES3, ES4, and ES5).² While the differences between the 4-H Science participants and NAEP respondents were statistically significant, and are encouraging, these differences should be interpreted with caution because the effect sizes were not strong enough to meet this evaluation’s threshold.³
4-H YOUTH EXPOSURE TO INFORMAL SCIENCE ACTIVITIES

- Youth with more exposure to 4-H Science programming participated in more informal 4-H Science and science leadership activities.
- More than three-quarters of respondents had helped with a community service project related to science and more than half taught others about science.
- African American participants were involved in an average of 2.5 science leadership activities while white participants were involved in an average of 2.0 activities.

4-H YOUTH SKILLS AND KNOWLEDGE

- More than three-quarters of youth reported that they can: write down information correctly, do an experiment to answer a question, tell others how to do an experiment, and explain why things happen in an experiment.
- Older youth (ages 13-18) reported they were capable of: recording data accurately (76 percent), using data to create a graph for presentation to others (75 percent), and using the results of an investigation to answer the questions asked (73 percent).

4-H YOUTH ASSESSMENT OF 4-H SCIENCE PROGRAM ENVIRONMENT

- 62 percent of respondents cited the thing they like best about their 4-H Science programs was the opportunity to spend time with their friends.
- 60 percent of respondents’ favorite thing was the opportunity to do hands-on activities and projects.
- For 30 percent of youth, the presence of kind, caring adults was a favorite aspect.

RECOMMENDATIONS/OPPORTUNITIES FOR LEARNING

- Similar to previous research studies based on gender, 8th grade girls were less likely to indicate interest in a mathematics- or science-related career than were boys with similar achievement and family backgrounds (Catsambis, 1994).
- 4-H may want to consider how youth-centered science programming could best be implemented using various delivery methods, since hands-on learning activities formed a major part of youth attraction to 4-H Science in this study.
- Students of color are still less likely to take advanced science courses than their white counterparts.
CONCLUSIONS

SURVEY FINDINGS: IMPLICATIONS FOR 4-H

Taken altogether, the evaluation findings reported indicate that 4-H is indeed implementing its rich and abundant variety of science, engineering and technology programs/activities to 4-H youth successfully. By providing engaging out-of-school programming, 4-H Science programs have the potential to bolster participants’ interest in pursuing education and careers in the STEM fields.

1 The percentage exceeds 100% due to rounding.
2 The number of 4-H Science respondents in each age group was not large enough to yield strong effect sizes when compared with the large group of NAEP respondents.
3 Data downloaded from the NAEP Data Explorer at http://nces.ed.gov/nationsreportcard/nde, on December 16, 2009.

Special acknowledgement to Policy Studies Associates for the development of the 2010 YEAK report.