

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

4-H Youth Development

Reporting on this Program

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
724	Healthy Lifestyle	10%		0%	
806	Youth Development	90%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	35.0	0.0	0.0	0.0
Actual Paid Professional	0.0	0.0	0.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2204999	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2204999	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
20693145	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

4-H Club enrollment in Illinois totaled 21,739. Nearly 135,300 youth were involved in some type of 4-H program [such as after-school group programs, conferences, and camps]. Additional **Metro Educator** positions were established in areas of 100,000 or more; they explored how to work with existing youth groups and offered sustained science and/or gardening opportunities for younger youth and helped older youth to develop civic engagement and leadership skills. Educational priorities for all 4-H delivery systems focused on: [1] learning employment skills; [2] experiencing healthy relationships; [3] becoming physically fit; [4] thinking green; and [5] engaging in science.

Emphasis on engaging youth in science included clubs participating in the **4-H National Youth Science Day** completing an **Ecobot Challenge** experiment and sharing their experience with other youth and adults at retail outlets. The 4-H robotics project membership doubled in enrollment with 1,807 youth enrolled in one of three project levels. Twenty-five teams participated in the **State 4-H Robotics Team Competition**. **4-H Tech Wizards**, designed to establish mentoring programs for at-risk, underserved youth in an after-school setting, continued to engage youth participants. State and national partners played an important role in providing grants to support these science experiences and opportunities for awarding college scholarships.

Cook County continued to offer youth science classes through its **Mobile Science Laboratory**. The **4-H Incubation and Embryology program** engaged youth in experiencing hands-on science concepts while caring for and observing the growth process of chicken embryos. **Science Siesta**, designed for girls in grades four through six, introduced them to fun hands-on science activities and career opportunities. The program aims to dispel myths that science is too difficult, not fun, and more suited to males. The new **Think Green** curriculum was developed by 4-H and horticulture Extension specialists to engage third through fifth grade youth in investigating how living things interact with each other and with their environment [also discussed in the Natural Resources and the Environment planned program].

Several activities and programs focused on career exploration and workforce preparation. **Illinois Summer Academies** are three-day conferences held on the University of Illinois campus that provide high school teens with opportunities to explore a college campus as well as hands-on workshops on potential careers in 4-H science or leadership development training. **Welcome to the Real World**, a multi-disciplinary curriculum and simulation that allows youth from 12-18 to explore careers and money management [balancing income and expenses] in adult life, was ongoing [also discussed in the Agricultural and Consumer Economics planned program impact section]. A grant-funded national applied research project, **Health Jam**, involved over 400 youth in two-day camps that allowed them to explore health careers and to learn about pursuing a healthy lifestyle and keeping their bodies fit [discussed in the Human Health and Human Development planned program impact report as well as the impact report for this planned program].

Building youth leadership skills is both a national and statewide area of focus. At the state level opportunities and training were provided for Youth Leadership Team members to plan and conduct conferences and to articulate the impact of the 4-H program to legislators. Youth participants in **Speaking for Illinois 4-H** also demonstrated their skills in articulating the impact of the 4-H program to legislators. Illinois 4-H is also focusing on developing teens as teachers. This past year the Illinois and Missouri 4-H programs joined forces to successfully implement the grant-funded **Teens Teaching Youth AgriScience/Biotechnology** program in the St. Louis metro area. Youth served on a number of committees to plan events through hands-on experience and mentoring by Extension staff members and adult leader advisors.

Volunteer Training: Volunteers are vital to delivering 4-H Youth Development programs and are instrumental as caring adults who create an environment that is a critical element to positive youth development. This past year more than 16,000 volunteers gave time and talent to the 4-H Youth Development program in Illinois with nearly 3,600 serving as club leaders. Leaders had instant access to a

series of online tips through **Leaders on the Go** written in a question and answer format. A six-session webinar series for volunteers included the following topics: [1] positive youth development; [2] communication within the 4-H Club; [3] behavior management; [4] risk management; [5] parental involvement; and [6] community service. In addition, the State 4-H Office promoted staff participation in the national **Everyone Ready®** online professional development modules focused on working with volunteers.

2. Brief description of the target audience

Youth between the ages of 8 and 19 including children of military families, volunteers who work with youth, teachers, parents, and community members.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	141136	0	282122	457379

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2012
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	1	0	1

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- New Extension Program Curricula Developed

Year	Actual
2012	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Increased Knowledge About Science And Health Careers
2	Increased Knowledge Of Positive Youth Development
3	Self-Reported 4-H Club Experiences That Provide Opportunities for Positive Youth Development
4	Number Of Youth Who Indicate Increased Knowledge Of Science, Engineering, And Technology

Outcome #1

1. Outcome Measures

Increased Knowledge About Science And Health Careers

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	4351

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Older youth need knowledge and skills to assist them in selecting careers and managing income and expenses in order to live as an independent adult. Reports of college degrees awarded, media reports, and business and industry leaders have expressed concerns about the declining interest of youth in science, engineering, and technology and have identified this decline as a problem that may undermine the country's standard of living and global position of leadership.

What has been done

University of Illinois Extension 4-H conducted Health Jam for more than 400 youth using a two-day camp format and an eight-week Walk Across Illinois activity. During the camps, youth learned how to keep their bodies healthy and fit and explored health professions. The Welcome to the Real World training and curriculum materials for teachers and a simulation for their middle and high school students allow them to explore careers and money management [balancing income and expenses] in adult life. This past year 4,004 youth from 29 counties participated in Welcome to the Real World and over 400 youth participated in Health Jam.

Results

Using an evaluation distributed to youth participants in Welcome to the Real World, 369 [33%] of the 1,029 who completed the evaluation indicated that they had increased their skill in exploring career possibilities. Using a pre- and post-test evaluation format, 224 [54%] of the 415 Health Jam youth respondents were able to list at least one additional health profession on the post-test. A paired-samples t-test analysis indicated a statistically significant increase in the number of health professions participants listed on the post-test as compared to the pre-test. In addition, at one location 34 of 65 participants [52%] learned to recognize equipment used by lab technicians and doctors. A recent survey of Illinois 4-H graduating seniors revealed that 136 of 144 [94%] respondents know of careers that are related to their 4-H project and 80 of 144 [56%] are looking into a career related to their project. A second recent survey of youth experiences in 4-H clubs

across Illinois revealed that 3,722 respondents [83%] do things in 4-H that help them think about a career. In addition, 82 of 144 [57%] indicated they are likely to choose a college major related to their 4-H project [evidencing an influence of 4-H on their college decision]. Additional information about these studies is included in the evaluation section of this planned program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Increased Knowledge Of Positive Youth Development

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Self-Reported 4-H Club Experiences That Provide Opportunities for Positive Youth Development

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	4200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ensuring that young people who participate in 4-H youth development programs have experiences of the highest quality is important. When young people join 4-H, inherent in their membership is the promise of an opportunity to gain a sense of belonging within their group, independence through decision-making and responsibility, a spirit of generosity toward others, and mastery through project completion, presentations and exhibitions.

What has been done

4-H Club enrollment in Illinois totaled 21,739 in 2011-12. Access was provided to 4-H project resources and experiences, club meetings, and activities at the club, county, and state level for 4-H members. These resources and activities incorporated opportunities for youth to experience the elements of positive youth development. This past year nearly 3,600 adults served as club leaders. Leaders had instant access to a series of online tips through Leaders on the Go written in a question and answer format. A six-session webinar series for volunteers included the following topics: [1] positive youth development; [2] communications within the 4-H Club; [3] behavior management; [4] risk management; [5] parental involvement; and [6] community service. A survey of youth experiences in a subset of 4-H clubs across Illinois was created and conducted in the spring of 2012. The survey included 16 close-ended questions asking about the youth respondents attitudes toward 4-H. The responses were coded on a four-point scale, with a value of 1 indicating strong disagreement to the statement and a value of 4 indicating strong agreement. 4-H members in a sample subset of clubs in each county completed the survey at a club meeting. The survey was distributed by 4-H leaders and collected by a 4-H staff person who was present.

Results

The total number of respondents in the data file that was analyzed was 4,579. In the analysis, the questions were organized into four themes: [1] belonging; [2] independence; [3] generosity; and [4] mastery. These reflect the four components of positive youth development. The evaluation indicated that 4-H clubs are providing opportunities that allow more than three-fourths of the youth respondents to experience belonging, independence, generosity, and mastery. With a few exceptions, the higher the age [and the higher the grade in school], the greater the percentage of respondents that agree or strongly agree with the 16 questions. When comparing respondents who answered yes to having at least one leadership activity with those who had none, differences in their agreement or strong agreement with the statements in the four categories of positive youth development were small but all were statistically significant at the $p < .05$ level. Comparisons of those who answered 'yes' to having a least one item of participation beyond their club with those who had none revealed significant differences [higher] in agreement or strong agreement for statements in each category of positive youth development. Results are further discussed in the evaluation section of this planned program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle
806	Youth Development

Outcome #4

1. Outcome Measures

Number Of Youth Who Indicate Increased Knowledge Of Science, Engineering, And Technology

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	3000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Business leaders in Illinois are struggling to find the science, technology, engineering and mathematics [STEM] talent they need to stay competitive. Youth need more exposure to challenging and engaging content. Exploring the capabilities and applications of robots offers a glimpse into the future of science, technology, engineering and math. Youth can learn to put inquiry science techniques into practice, grow more familiar with the engineering design process, and use process tools that scientists and engineers use to solve real-world problems.

What has been done

The 4-H Incubation and Embryology project has been carried out in elementary school classrooms for over two decades using hands-on science concepts in caring for and observing the growth process of chicken embryos from the inception of the eggs through hatching of chicks. The majority of youth participants were in K-3 classrooms, but middle school youth were also engaged in the activities this past year. Curriculum development and training was provided by the Extension poultry faculty member, state 4-H staff and local educators. Evaluations were collected from 314 teachers in nine counties in Northeastern Illinois to determine their perceptions of impact related to the nearly 14,000 students science ability gains. With the goal of increasing youth interest in science, University of Illinois Extension staff and volunteers conducted the EcoBot Challenge, this year's National Youth Science Day experiment, with 85 different groups reaching over 3,500 youth in elementary school through high school grades. In addition, 267 4-H youth science teen ambassadors were involved in helping to provide this learning opportunity for other youth. EcoBot Challenge provided an opportunity for youth to program a robot to clean up a simulated environmental spill. In addition, youth designed a set of control surfaces to program the Eco-Bot to perform the cleanup project, and then measured the effectiveness of their control surface by recording how much of the spill is 'swept up' by the Eco-Bot.

Results

Using a scale of 1-4 [1=Not at all; 2=Sometimes; 3=Usually; 4=Always] , grade K-2 teachers were asked to rate their student's level [as a group] with respect to nine science abilities, and grades 3-12 teachers were to rate their student's level on 19 science abilities after participating in the multi-week 4-H Incubation and Embryology project. Observed increases in at least one of these skills were reported by 84% of the 248 teachers who answered these questions. At the end of the EcoBot Challenge, youth participants were asked to respond to several questions. Findings from the 77 groups evaluated showed evidence that youth who participated in the EcoBot Challenge got excited about robotics, engineering, and science. Specifically: [1] 99% would like to do more activities like this in the future; [2] 96% have a better understanding of what robots can do, how

they are controlled, and the role they serve in solving environmental problems; [3] 94% had a hands-on opportunity to explore and design different ways to control a robot's motion; and [4] 88% could identify design factors that influence the behavior of the EcoBot.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Competing Programmatic Challenges

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Incubation And Embryology Science Program

Using materials developed by the University of Illinois poultry specialist in conjunction with state and local 4-H staff, 314 teachers in nine Northeastern Illinois counties responded to a survey asking them to share their perception of the impact of the multi-week **4-H Incubation and Embryology Program**. A reported 9,269 students were enrolled in grades K-2 and 4,698 students were enrolled from grades 3-12. Two surveys were tailored around grade level science skills learning standards for the two grade level groupings [9 science skills for K-2 and 19 for Grades 3-12].

With respect to students in grades K-2, 151 [80%] of the 208 teachers who answered this question indicated a perceived increase in at least one of these 19 science abilities. More than one-half of the teachers reported perceived increases in their students' observation ability [68% of the teachers], predicting ability [63%], hypothesizing ability [62%], organizing/ordering/classify [57%], comparing/contrasting [55%], and using tools [55%]. Slightly under half of the teachers perceived increases in their students' ability to communicate/demonstrate [49%], design solutions [48%], and model/graph/use numbers [48%].

With respect to students in grades 3-12, 57 [75%] of the 74 teachers who answered this question indicated a perceived increase in at least one of the nine science abilities. More than one-half of the teachers reported perceived increases in their students' demonstrating data collecting ability [70% of the teachers], observation ability [59%], and hypothesizing ability [52%]. Between 40% and 50% of the teachers reported perceived increases in students' ability to question [49%], interpret/analyze/reason [48%], communication/demonstration [47%], evaluate [46%], infer [46%], summarize [46%], predict

[45%], problem solve [45%], troubleshoot [45%], collaborate [44%], optimize [43%], use tools [41%], measure [41%] and compare/contrast [38%]. Less than one-third of the teachers perceived increases in students' abilities to test [30%] and model/graph/use numbers [22%].

Students were asked to hold up their hands in responding to science-related statements. More than 90% of the teachers sharing the information indicated that more than half of their students like science, disagreed that science is boring, and would like to do more activities like this incubation and embryology program in the future.

4-H Positive Youth Development Club Survey

A survey of youth experiences in a subset of 4-H clubs across Illinois was conducted in the spring of 2012. The bulk of the questionnaire that was developed consisted of 16 closed-ended questions asking about the youth respondents' attitudes toward 4-H. The responses were coded on a four-point scale, with a value of 1 indicating strong disagreement to the statement and a value of 4 indicating strong agreement. 4-H members completed the survey at a club meeting. The survey was distributed by 4-H leaders and collected by a 4-H staff person who was present. The total number of respondents in the data file that was analyzed was 4,579.

In the analysis, the questions were organized into four themes: [1] belongingness; [2] independence; [3] generosity; and [4] mastery. These reflect the four components of positive youth development. The percentage of youth who agreed or strongly agreed with each statement and the mean score [based on a rating scale of one through four] follows:

Belongingness Items: We found that 96% felt they receive help from 4-H leaders and others when needed [n=4,503 mean score=3.5]; 95% feel included, rather than excluded in 4-H [n=4,514 mean score=3.5]; 95% felt adult leaders in 4-H listen to what they say [n=4,486 mean score=3.5]; and 91% feel comfortable sharing ideas at 4-H [n=4,549 mean score=3.3].

Independence Items: We found that 94% felt experiences in their 4-H club helps to prepare them for their future [n=4,490 mean score=3.4]; 83% felt they help to make decisions about what happens in 4-H [n=4,467 mean score=3.2]; 83% felt they do things in 4-H that help them think about a career [n=4,485 mean score=3.2]; and 76% felt they had a chance to lead 4-H activities or meetings [n=4,422 mean score=3.1].

Generosity Items: We found that 95% felt that as part of 4-H they were able to work on service projects that help the community [n=4,527 mean score=3.4]; 93% felt that activities in 4-H encouraged them to help others [n=4,532 mean score=3.3]; 91% felt that 4-H helps them to think of ways to make a difference in their community [n=4,476 mean score=3.3]; and 91% felt that as a part of 4-H, they are able to contribute to community issues [n=4,414 mean score=3.1].

Mastery Items: We found that 93% of 4-H youth share learning with others because of their 4-H club experience [n=4,482 mean score=3.4]; 90% felt that in a 4-H club, they were encouraged to set club and project goals [n=4,500 mean score=3.3]; 86% felt that they often take part in hands-on activities during 4-H meetings [n=4,497 mean score=3.2]; and 77% felt they worked with adult leaders and 4-H members to plan activities [n=4,547 mean score=3.0].

The data was also analyzed with respect to: [1] grade in school; [2] age; [3] 4-H leadership [club office, county/region/state leadership role, completion of a 4-H record or awards application]; [4] 4-H experiences [county fair or events, regional contests or events, state fair or state events, 4-H camp]; and [5] how often the respondent socializes with 4-H members outside of 4-H meetings. The latter three items related to 4-H experience were analyzed by comparing the counts of each individual respondent's agreement or strong agreement for the four questions in each of the four areas of positive youth development.

4-H Graduating Seniors Career Development Survey

A questionnaire seeking to evaluate the effectiveness of 4-H program efforts in the area of career development was developed for online administration to be completed by 4-H members who were graduating seniors. The survey consisted of 17 closed-ended questions asking respondents about ways in which 4-H helped them with their plans for the future. The responses were coded on a four-point scale, with a value of 1 indicating strong disagreement with the statement and a value of 4 indicating strong agreement. There were also two yes-no type questions.

Names were gathered from the 4-H enrollment database, and an email invitation to participate in the study was sent by 4-H staff in local offices to the graduating 4-H members in the spring of 2012. The staff also used U.S. postal mail, text messages, or social media to alert the graduating youth about the survey and to encourage their participation. A reminder email was sent to those youth who had been invited but not responded.

One hundred forty-six 12th graders completed the online survey, two of which were not planning on going on to higher education. These respondents represented 10-20% of the enrolled 4-H graduating seniors.

The following six questions were focused on measuring the influence of 4-H projects on plans for higher education. The percentage represents the number of students selecting three or four on the scale for that question.

We found that 96% felt they were learning skills through 4-H that they could use in a future job [3.58 average group score]; 94% felt they now knew of careers that were related to their 4-H project [3.53 average group score]; 91% believed they could think of [more] ways in which their 4-H project could be a business [3.24 average group score]; 75% felt that, as a result of participating in 4-H, they now know of a college major related to their 4-H project [3.03 average group score]; 57% stated they were likely to choose a college major related to their 4-H project [2.76 average group score]; and 55% stated they were currently looking into a career related to their 4-H project [2.75 average score]. Of interest is that more males than females are looking into a career and college major related to their 4-H project.

The additional six questions below were focused on measuring the influence of 4-H staff/leaders on plans for higher education. Results follow:

We found that 75% had already talked to people who work in a career related to their 4-H project [3.08 average group score]; 68% felt that 4-H staff/leaders took an active interest in their studies [2.86 average group score]; 66% felt that 4-H staff/leaders helped them identify their strengths and weaknesses [2.77 average group score]; 65% stated that

4-H staff/leaders have talked to them about what skills they need to achieve their future goals [2.73 average group score]; 63% felt that 4-H staff/leaders had spent time talking to them about what they wanted to do in the future [2.71 average group score]; and 47% stated that 4-H staff/leaders helped them to make career decisions [2.49 average group score]. We also found that 12.6% of respondents reported starting a business as part of their 4-H project and 27% reported that a specific 4-H program or event influenced their future plans.

Information on plans following high school graduation, college campus visits, years enrolled in 4-H, 4-H experiences, gender, race, and ethnicity was also collected from each individual. When comparing differences in responses by number of years in 4-H, the percentages of youth who agreed or strongly agreed were generally higher for youth who have been in 4-H for 10 years or more compared to youth with between four and nine years. A slightly higher percentage of 4-H members in this older group reported having started a business as part of a 4-H project. Approximately one third of respondents who have been in 4-H for the longest period of time say that a specific 4-H program or event has influenced their future plans, while about a fourth of respondents who have been in 4-H between 4-9 years agreed with this statement.

With respect to plans for higher education, one-third of respondents plan to attend an in-state institution offering a four-year college degree and about one-third plan to attend a community college. A majority of respondents did not visit a college campus through 4-H.

4-H Science Baseline Study

A questionnaire seeking to establish a baseline regarding 4-H members attitude/interest in science, their opinion regarding the relevance/value/utility of science, encouragement to engage in science, and aspirations regarding pursuing a career in science or using it to solve everyday problems was distributed to youth at 4-H science group meetings or science-related 4-H events and collected after completion by a 4-H staff member and volunteer during the summer of 2012. The questionnaire included 11 statements regarding science and 4-H. Youth were instructed to rate the statements as 'strongly disagree', 'disagree', 'agree', and 'strongly agree'. Those coding data for analysis assigned values ranging from 1='strongly disagree' to 4='strongly agree'.

A total of 679 youth who were eligible completed the questionnaire. Two very large events accounted for a substantial number of these respondents [149 participating in the state livestock judging contest and 125 attending a County Science Discovery Day], so the sample was split into three groups for analysis. An analysis by question for the majority of the respondents [401] group follows:

Attitude/Interest in Science

We found that 87.2% percent agreed or strongly agreed with the statement 'I like science', 82.9 percent agreed or strongly agreed with the statement 'I am good at science', and 70.7 percent agreed or strongly agreed with the statement 'I do science-related activities that are not for schoolwork'.

Relevance/Value/Utility

We found that 87.3 percent disagreed or strongly disagreed with the statement 'Science is boring', 80.6 percent agreed or strongly agreed with the statement 'I think science, engineering, or technology will be important in my future job', and 76.6 percent agreed or strongly agreed with the statement 'I can explain to others how I use science, engineering, or technology in my 4-H program/project'.

Encouragement

We found that 87.6 percent agreed or strongly agreed with the statement 'I often get to do hands-on activities in my 4-H program/project', 79.5 percent agreed or strongly agreed with the statement 'I am encouraged to ask questions about science, engineering, or technology, and 61.1 percent agreed or strongly agreed with the statement 'When I graduate from high school, I would like to have a job related to science'.

Aspiration

We found that 82.8 percent agreed or strongly agreed with the statement 'I think a career in science, engineering, or technology would be exciting' and 70.5 percent agreed or strongly agreed with the statement 'Science is useful for solving everyday problems'.

Of note, the two other large groups tended to have fewer "strongly agree" ratings, but average group scores still exceeded 2.0.

The three groups were also compared on the basis of: [1] age; [2] school level; [3] gender; [4] number of out-of-school time activities in which they participated; [5] how often they socialized with other members of their club outside of meetings; and [6] experience with certain 4-H activities or programs. There were statistically significant differences between these three groups for all or parts of each of these items.

Key Items of Evaluation

Incubation And Embryology Science Program

After conducting the **4-H Incubation and Embryology** program in their classrooms, more than half of the K-2 and 3-12 teachers perceived observed increases in their student's hypothesizing and observation skills. More than half of the K-2 teachers also reported observed increases in demonstration of data collection skills. In addition, more than half of the grades 3-12 teachers reported observed increases in their student's ability to predict, organize/order/classify, compare/contrast, and use scientific tools.

4-H Positive Youth Development Club Survey

The evaluation indicates that 4-H clubs are providing opportunities that allow more than three-fourths of the youth respondents to experience belongingness, independence, generosity, and mastery. With a few exceptions the higher the age [and the higher the grade in school], the greater the percentage of respondents that agree or strongly agree with the 16 questions.

When comparing respondents who answered yes to having at least one leadership activity with those who had none, differences in their agreement or strong agreement with

the statements in the four categories of positive youth development were small but all were statistically significant at the $p < .05$ level. Comparisons of those who answered 'yes' to having a least one item of participation beyond their club with those who had none revealed significant differences [higher] in agreement or strong agreement for statements in each category of positive youth development. Those respondents who socialized outside of 4-H meetings with other 4-H members also had statistically significant differences in their agreement or strong agreement with the questions related to belonging, independence, generosity, and mastery.

When asked what they like most about their 4-H club experience, most frequently mentioned were club activities and projects, variety of activities, making a difference, community service, helping others, learning opportunities/things to learn, and fairs, shows, and fair projects. Note that complete findings from this survey are available upon request.

4-H Graduating Seniors Career Development Survey

In general 4-H participants agreed that 4-H project experiences influenced their higher education plans more than did 4-H staff and leaders. However, more than 40% of the youth indicated that 4-H project experiences are not influencing their choice of a college major and career. The influence of a caring adult increases with years in 4-H and more females report having spent time talking with 4-H staff/leaders than males. 4-H members reported that their 4-H experience: [1] exposed them to areas of interest; [2] helped them develop leadership skills; [3] instilled in them a work ethic and sense of responsibility; [4] helped them to grow and develop and to become more confident; and [5] reported learning skills through 4-H that they can use in a future job. Program improvement opportunities for the Illinois 4-H program include increasing opportunities for 4-H members to visit college campuses, supporting 4-H members in their business start-ups, and enhancing the role of caring adults. Note that complete findings from this survey are available upon request.

4-H Science Baseline Study

Overall, there appears to be a pattern in which 4-H youth are reporting more positive attitudes toward science and stronger confidence in their science ability than their peers based on two national surveys. Youth agree more strongly than national study peers that they: [1] would like to have a job related to science when the graduate from high school [61.1%]; [2] think a career in science, engineering, or technology would be exciting [82.8%]; and [3] agree that science is useful for solving everyday problems [79.9%].

Similar to findings in other national surveys, 4-H participants are less likely to report positive attitudes toward science as they got older. However, at the higher grades, youth in this Illinois sample were more likely to agree that they like science and are good at science than their peers in these national reports. For example, 83% of middle school youth report that they are good at science as compared to only 44% in National Assessment of Educational Progress sample and 52% in a national 4-H sample.

National science standards identify communication skills as a critical component to science literacy. One's ability to express ideas and identify new questions are valued skills, and all 4-H science programs are designed with these target outcomes in mind. While the majority of youth across our sample agree they have these opportunities [nearly 80%], this

survey identifies that youth who have been in a leadership role, have participated in 4-H regional contests or events, or have attended 4-H camp are significantly more likely to agree that they can explain how to use science, engineering, or technology in their 4-H project. This difference may be attributed to the advanced training and experience associated with these leadership and mastery activities. Youth who have participated in regional events are also significantly more likely to agree that they are encouraged to ask questions about their science, engineering, or technology project.

Illinois plans to continue distributing the questionnaire to various 4-H science participants over the next few years to identify progress and success in the priority 4-H is placing on science projects and new science activities to interest youth in pursuing careers in science, engineering, and technology.

Complete findings are available upon request.