ABSTRACT: Citizen science programs across the country invite the public to participate in scientific research. Through these experiences, participants learn scientific data collection protocols and have opportunities to observe nature, which naturally leads to asking questions about the natural world. A new project in Minnesota is training leaders of youth groups to use citizen science experiences to stimulate curiosity and inspire motivation to design and carry out scientific research projects. This unique program model fosters authentic inquiry in youth ages 10-14 outside the traditional school setting, such as 4-H clubs, scout groups, or community youth programs. In the first two years of the five-year, NSF-funded project, 186 youth were served in 22 research teams.

Driven to Discover: Inquiry in nonformal settings

During the first two years of the five-year project, participants met regularly with their research teams in parks, schools and other areas to collect citizen science data. Individuals and small groups of youth posed questions based on phenomena experienced during these meetings, then carried out an original inquiry project. All research teams were invited to present their investigations in Fall Research Summits.

OBSERVE
Participating in citizen science projects provides opportunities for youth to observe natural phenomena. Journaling exercises help focus observations and stimulate reflection.

QUESTION
Observations naturally trigger curiosity. Youth document questions on an “I Wonder” board, then learn to convert their questions into descriptive, comparative, or correlative questions ready for testing. Mentoring by professional scientists increased participants’ science confidence and exposed youth to science careers.

INVESTIGATE
Youth identify the possible answers to their research question, then design an investigation to gather evidence to support or refute one of their hypotheses. Youth analyze their data and communicate their findings to each other at a state-wide Research Summit in the Fall.

FORMATIVE EVALUATION RESULTS: Preliminary evaluation of years one and two of the project has shown that the program model leads to changes in skills, attitudes and behaviors of both youth and adult participants (See figures 1 and 2 above). End-of-season focus groups confirmed that many club leaders increased their skills and confidence in facilitating youth inquiry. Pre-Post assessments indicated positive club leader behavior change in requiring youth to design investigations, evaluate data, and explain using evidence. Many participating youth presented their research projects at a Research Summit we host each fall, and many took these projects to regional science fairs. Of the project youth who presented their projects at regional fairs, 91% advanced to the state science fair, compared to 14% of total regional participants, suggesting that involvement in the program had a strong positive impact on project quality.

AUTHORS: Andrea Lorek Strauss, Extension Educator, Fish, Wildlife and Conservation Education, Karen Oberhauser, Associate Professor, Department of Fisheries, Wildlife and Conservation Biology, Pamela Larson Nippolt, Program Leader, Extension Center for Youth Development, Robert B Blair, Associate Professor, Department of Fisheries, Wildlife and Conservation Biology, Nathan Meyer, Program Leader, Extension Center for Food, Agriculture & Natural Resource Sciences