

Making the Best 4-H Clubs Better

Project STEM (Science is FUN!)

Intended Audience:

- 4-H club members

Lesson Objectives

Club members and parents will:

- Learn that the jobs of the future are STEM jobs
- Learn and practice science inquiry
- Design and conduct a project-related experiment using science inquiry

Time: 20 minutes

Equipment and supplies

- Handout:
 - What is Science Inquiry? and Science Checklist
 - Can my Horse See Color
- Computer, projector, and Internet access for showing video

Do ahead

- Review lesson
- Gather equipment and supplies
- Copy handouts, one per member
- Set up equipment and test Internet access and sound to show video

BACKGROUND

Hearing a lot lately about STEM (Science, Technology, Engineering, and Math)? The jobs of the future are STEM jobs. The demand for professionals in STEM fields is projected to outpace the supply of trained workers and professionals. Additionally, STEM competencies are increasingly required for workers both within and outside specific STEM occupations. STEM is already a major component of many of our 4-H projects. Through project work, many 4-H members can have authentic STEM experiences and explore STEM focused careers. Animal *science* and food *science* are STEM focused projects areas; math is a component of creative arts and fashion projects, and so forth. In this lesson, 4-H members will learn the basics of science inquiry and will formulate a project-related question for more in-depth exploration. Such exploration is an excellent project learning experience and may even inspire a Science Fair project! Challenge members to bring their findings to the next club meeting!

WHAT TO DO

Activity 1: What is Science Inquiry? - Review the *What is Science Inquiry?* handout with your club members. Ask them to tell you if the following are good questions for testing through science inquiry and to explain why or why not. Some questions are not testable, cannot be completed in a reasonable time, or come with too many variables:

- Which feed will make my project animals grow to market weight the fastest? (Could be testable, but animal growth rates may be due to multiple variables, and the time to test could be very long.)
- Will butter or shortening make better-tasting cookies?
- Why do plants need water? (Could this be changed to make it a more “testable” question?)

Send members outside for five minutes to look around and find something they want to know more about. Ask them to develop a question to address what they want to find out. Bring them back together and ask a few members share their questions. Discuss whether the question is “testable.”



Sources

- Federal Five Year STEM Education Strategic Plan, 2013, http://www.whitehouse.gov/sites/default/files/microsites/ostp/stem_stratplan_2013.pdf
- Willis, Patrick and Mayer, Jon, 4-H Faculty, Oregon State University Extension, 2013. "Science Inquiry" and "4-H Science Checklist."

Activity 2: Designing a Project-related Experiment - Show the video at <http://vimeo.com/26169269>. This video was made by the Oregon State University 4-H Youth Development Program and is one in a series illustrating project-related science inquiry. Discuss the experiment. Was it a good one? How many variables were there? How could it be revised to make it even better? If you do not have the technology available to show the video, review and discuss the included resource of a sample horse project-related experiment, *Can Your Horse Really See Color?*

Ask members to pair up with one or more other members who are taking the same project. Have them come up with a question they can test regarding something they want to know about their project. Remind them to consider animal welfare when designing their experiments. Discuss the questions as time allows. Challenge members to test their question (Refer them to the handout for additional support) and have them report back at your next club meeting. This is a great project learning experience. (Members are expected to complete several each year.) It might also be the foundation of a future school science fair project!

TALK IT OVER

Reflect:

- How is science part of your 4-H project? Give an example.

Apply:

- Where else do you use science inquiry? (For school science fairs, etc.)
- What jobs use science inquiry?
- What STEM focused jobs relate to your project? What would you need to do to prepare for one of these jobs?

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