MINNESOTA 4-H  
SCIENCE, TECHNOLOGY, ENGINEERING, MATH  
Minnesota 4-H STEM Team memo  
April, 2014

WHERE WE ARE

The Minnesota 4-H STEM Team efforts will focus on 4-H Engineering programs through the 2015-16 program year. Engineering Clubs are only one part of the Team’s charge which is to develop a comprehensive program model for the STEM programming that will be offered by Minnesota 4-H.

The STEM Team’s goal is that the Minnesota 4-H Science and Engineering (or STEM) programming will be engaging, authentic, and will appeal to new audiences. Youth who participate in these long-term STEM learning experiences will:
1. Increase Intrinsic Motivation
2. Increase STEM Topic/Content Knowledge
3. Exhibit STEM Career Interest/Aspiration

The Minnesota 4-H STEM Team has identified outcomes; made a decision on target audience; developed resources for the Engineer It Challenge Workshop; and launched the Engineering Design Challenge 2014: Build a Rube Goldberg Machine (RGM) for the Minnesota State Fair.

The RGM Challenge is also a field test that will inform the development of the model for 4-H Science and Engineering (or STEM) Clubs.

Currently, the Team is continuing efforts on developing the comprehensive plan. They will also be developing the model for STEM Clubs for 2014-15 and will be seeking counties willing to pilot the model.

WHERE WE HAVE BEEN

4-H staff and 4-H volunteers provided many learning experiences in Science and in Robotics in the 2012-13 program year.

Youth have participated in:

- Events and activities that build STEM Topic/Content awareness such as single-sessions, information booth visits, project day sessions, NYSD, or watching presentations
- STEM Topic/Content samplers like multiple-sessions, Day Camps, a series offered at Clubs, or some activities in a 4-H curriculum
- STEM Topic/Content Activities with a moderate depth of content such as participation in full-day events or activities, Camps, or Short-term and Afterschool Clubs
- In-depth or long-term STEM Topic/Content learning experiences which includes STEM Clubs and Robotics Clubs in all Club types

We hope that you continue with the great STEM programming that you are already doing. We will be contacting you to learn about programming that you are doing this year so we can complete an inventory of current Minnesota 4-H STEM learning experiences.
WHERE WE ARE HEADED

The Minnesota 4-H STEM Team will be utilizing and adapting criteria from the nationally developed 4-H Science Checklist as one of the building blocks for developing the model for the long-term 4-H Science and Engineering Clubs. This model will include the components of service, a showcase opportunity, as well as leadership and mentoring opportunities for youth like our other 4-H learning experiences. The model will align with the Minnesota 4-H Logic Model and with the National 4-H Science Logic Model.

Some of the important criteria from the 4-H Science Checklist that will be part of the design of the Minnesota 4-H Science and Engineering long-term learning experiences are:

The programming is built on juried 4-H Science and Engineering project curriculum.
The activities use inquiry to foster the natural creativity and curiosity of youth.
Youth learn the eight Practices of Science and Engineering.

A Science Framework for K-12 Science Education provides the blueprint for the Next Generation Science Standards (NGSS). The eight Practices of Science and Engineering that the Framework identifies as essential for all students to learn and describes in detail are listed below:

• Asking questions (for science) and defining problems (for engineering)
• Developing and using models
• Planning and carrying out investigations
• Analyzing and interpreting data
• Using mathematics and computational thinking
• Constructing explanations (for science) and designing solutions (for engineering)
• Engaging in argument from evidence
• Obtaining, evaluating, and communicating information

The eight “practices represent what youth are expected to do, and are not teaching methods or curriculum.” (NGSS, Appendix F, p.3)

WHAT’S NEXT?

Looking for resources for summer activities? or
Interested in being a pilot county? Contact the person with the STEM function in your region.
Inventory of current 4-H STEM programming. We will be contacting you this spring or summer.

RESOURCES

For additional explanation and more detail about the practices, please reference this link:

For additional information about the 4-H Science Checklist, please reference this link:
http://www.4-h.org/resource-library/professional-development-learning/science-training-guides-resources/