4-H STEM

HEAD HEART HANDS HEALTH

What is STEM?

- **STEM** - an acronym for the core education and career areas of Science, Technology, Engineering and Mathematics
- **Science** – the study of the structure and behavior of the physical and natural world through observation and experiment
- **Technology** – the application of scientific knowledge for making, modifying and using tools, machines, and techniques for practical purposes
- **Engineering** – the application of science, technology and mathematics concerned with the design, building and problem solving
- **Mathematics** – the science of numbers, their operations, quantity and relationships; can be either abstract or applied within other disciplines

Note: In some places you may see it written as STEAM. In these instances the 'A' may stand for Art or Agriculture, both of which are engrained in 4-H programing.

While each of these areas has its own independent value, they come together to provide the knowledge and skills needed by our future leaders and workforce.

Why is STEM important?

STEM education is about much more than ensuring that our future accountants, doctors, engineers, scientists and technicians have the skills they need within their career fields. It is about ensuring that our future leaders and workforce are STEM literate and have the ability to observe, communicate, problem solve and do basic calculations.

Goals of 4-H STEM programing

1. Expose youth to a variety of STEM topics.
2. Encourage youth to explore STEM topics.
3. Empower youth to apply their STEM knowledge and skills.
4. Develop skills in staff and volunteers.
5. Connect youth to STEM careers and the professionals that work in them.

Science and Engineering Practices

4-H STEM concepts are based upon national and South Dakota science education standards and target the development of STEM knowledge and skills. The eight Science and Engineering Practices found in the South Dakota Science Standards are:

1. Asking Questions and Defining Problems
2. Developing and Using Models
3. Planning and Carrying Out Investigations
4. Analyzing and Interpreting Data
5. Using Mathematics and Computational Thinking
6. Constructing Explanations and Designing Solutions
7. Engaging in Argument from Evidence
8. Obtaining, Evaluating and Communicating Information

South Dakota State University Extension

South Dakota 4-H Outcomes

4-H utilizes a 'learn by doing' approach that's ideal for teaching core STEM concepts and skills. STEM activities also help to further advance the South Dakota 4-H outcomes.

Leadership

4-H STEM programs not only encourage knowledge and academic development of youth, but they support youth leadership through group work, problem solving and fostering and understanding the civic impact of STEM.

Life Skills

Science practices play a vital role in inquiry and experiential learning. These practices foster the development of many life skills (i.e. critical thinking, planning and communication) through encouraging curiosity using investigations, tools and practices of specific STEM fields. For more information on Life Skills see Life Skills in South Dakota 4-H (link).

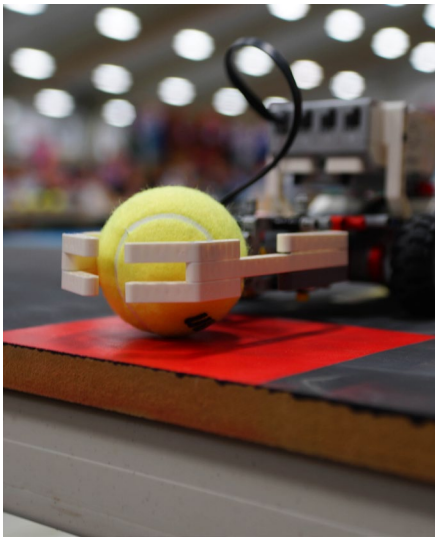
Workforce

In addition to building STEM literacy and developing STEM skills, a key component of 4-H STEM programing is connecting youth to STEM in the world around them. This can be through activities that make them aware of the STEM in their daily lives, or by introducing them to the wide range of STEM careers available to them. Some STEM programs also connect them directly to industry professionals.

Social

Through 4-H STEM opportunities, youth learn how to work together with others in a team, which aids in their conflict resolution skills, self-esteem and self-responsibility among other social skills. STEM opportunities also provide insight on how youth can identify challenges in their communities and find solutions to them.

Photo courtesy of National 4-H



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