



## STEM PROJECT AREA



*This project area is designed to help you explore the world of Science, Technology, Engineering, and math. Science is a way for us to look at and work to understand the world around us.*

### Ideas for Project Area Learning

- Investigate issues ranging from geology to climate change by studying earth sciences. Make and find your way using the technology and software that puts the world at your fingertips, and geospatial mapping.
- Develop an interest and understanding of science and Engineering Technology and math.
- Develop your problem solving and logical reasoning skills through experiments.
- Develop responsible attitudes about science and how science relates to your world.
- Learn about how bridges are built.
- Learn about electric motors and how they work.
- Discover the science behind theatre lighting.
- Explore the principles involved in building roller coasters.
- Find out how wind turbines work.
- Try to make your own Rube Goldberg-type machine with materials around your house.
- Learn about genetics.
- Explore what kinds of careers are available in various STEM industries.
- Learn about the chemistry of adhesives and test their strength.
- Learn about cloud formations and weather patterns by studying meteorology.
- Learn about the chemistry involved in baking.
- Learn about wearable technology.
- Discover some of the creative uses for 3D printing.
- Learn about a historical scientist or mathematician that interests you.
- Discover how robotics technology is used in medicine.

### APPLY WHAT YOU'VE LEARNED

#### Communication

- Do an educational presentation at your county fair related to science and technology.
- Enter a robotics event.
- Present information about hand washing and germs to a local daycare class.

#### Civic Engagement

- Present an idea for improving efficiency to your city council.
- Work with your city to improve a walkway, a park or a playground using science.
- Organize an event to get young kids excited about rockets through hands-on activities.

#### Leadership

- Organize a field trip to a local lab, business, or industry to learn how science and engineering inform their work.
- Teach a workshop on robotics or car restoration at a day camp.

#### Entrepreneurship

- Provide tutoring services for STEM-related classes.
- Offer a summer science camp with hands-on activities.



## Goal Setting and Record Keeping

Goal setting is an ongoing process that guides your project area learning. Having goals is like having a road map to show you how to get you to where you want to go. Record keeping is also an ongoing process and another important life skill. In 4-H, you are encouraged to select from a variety of record keeping formats to meet your own personal needs and your preferred learning style. Keeping records of your learning experiences helps you determine how well you met your goals. Goal setting and record keeping improve your skills in organization, communication, planning, and evaluating.

## Iowa 4-H Event Opportunities

- Participate in **county and state fair** exhibit classes.
- Check with your local county 4-H youth development staff to see if there are special events or **workshops in your county** that you want to attend to learn more about your project areas.
- Iowa 4-H members in grades 9–12 can apply for **State Project Area Awards** at State Recognition Day. Applications are open December through January.
- Meet young people from around the state who have completed grades 8–12, and share your interests at the **Iowa 4-H Youth Conference** held at Iowa State University in late June.
- Each March, hundreds of student researchers in grades 6–12 meet with professionals to discuss their findings and compete for scholarships during the **State Science and Technology Fair of Iowa**.

## Share Your Learning With an Exhibit

- Make a poster on food safety in the kitchen.
- Create a display on the difference between colored light and the pigments used in paint.
- Create a hand-washing presentation kit that can be used at club meetings.
- Design a machine that solves an everyday problem.
- Conduct a science experiment and report on your findings.
- Create a display on the geometry involved in basketball.
- Do a presentation on the chemistry involved in making ice cream.
- Build a microscope for your cell phone.

## CAREER CONNECTIONS

- **Statisticians** gather numerical data and present it to help companies spot trends and make predictions.
- **Civil engineers** plan, design, and oversee construction and maintenance of building structures and infrastructure.
- **Software developers** work on researching, designing, implementing, and managing software programs.
- **Environmental scientists** study the effects of human activities on the environment and conduct tests to solve ecological problems.

## EDUCATION CONNECTIONS

- If you're interested in algebra, calculus, and developing new ways of conducting math, then you may enjoy studying **mathematics**.
- Learn **chemical engineering** if you're interested in designing products that involve chemical and biological changes.
- Students in **data science** learn more about technological methods and algorithms.
- **Engineers** study all types of math, science, and technology to create innovative new products.

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