



## MECHANICS PROJECT AREA



*The mechanics project area examines a range of fields linked to practical applications of power, energy, and electricity. Experience this technology firsthand while increasing technical and scientific literacy, communications, and decision-making skills.*

### Ideas for Project Area Learning

- Develop the skills and techniques needed to construct or repair items.
- Develop knowledge of safe practices and procedures.
- An understanding of the basic principles and theories of electricity.
- Increase knowledge and concern regarding the generation, transmission, and distribution of Electric Energy.
- Understand safety and equipment used in welding.
- Learn about electricity and electronics as they fit daily life.
- Maintain small engines in your home and garage.
- Discover how pistons work and how they are used in different machines.
- Understand the risks and importance of safety related to all mechanical systems.
- Learn about the different methods of welding and what materials are best suited to each type.
- Learn the different types of circuits and how they compare and how to construct each.
- Learn about the parts of your lawn mower and how to adjust the fuel and ignition systems.
- Diagnose engine problems and repair engines.
- Identify and eliminate risks in using mechanical systems.
- Experiment with different welds and beads for joints for constructing products.
- Practice safe operation of engines and engine driven systems, including tractors, combines, mowers, and other applications.
- Restore, repair, modify, or use the engine and drive system knowledge in practical ways with tractors.

### APPLY WHAT YOU'VE LEARNED

#### Communication

- Present safety information related to mechanical systems.
- Demonstrate the workings of a mechanical system.
- Teach how to construct or repair a mechanical system.

#### Civic Engagement

- Promote safety-related mechanical systems in your community.
- Do a small engine repair for the community.
- Check your friends' homes for electrical safety issues.

#### Leadership

- Lead a safety workshop.
- Organize a lawnmower tune-up clinic.
- Create a safe and responsible driving presentation.
- Give a demonstration on winter driving tips.

#### Entrepreneurship

- Write a business plan for a small mechanical repair business.
- Restore and resell automobiles or tractors.
- Review mechanical repair tools online in videos or on a blog.



## 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.

## Share Your Learning With an Exhibit

- Restore an automobile.
- Present or create a display on safe and responsible driving.
- Prepare a poster on how to drive cheaper and smarter.
- Make a display comparing the properties of gasoline and diesel engines.
- Make an exhibit of a small engine project.
- Give a demonstration of a small engine.
- Make an exhibit designing a wind generator.
- Create a poster display on tractor safety.
- Create a poster on GPS guided information.
- Prepare an educational exhibit on welding safety.
- Create an artistic or home furnishing exhibit by welding.

## CAREER CONNECTIONS

- **Electrical mechanics** test, repair, and rebuild motors, heaters, generators, electrical wiring systems, and controllers.
- **Aircraft mechanics** keep aircraft of all sizes in good working order. They complete inspections and perform maintenance checks and repairs.
- **Automotive mechanics** inspect and repair vehicles which run on gas, electricity, or ethanol. They diagnose problems through running and evaluating diagnostic tests.
- **Industrial machinists** repair the machinery used in factories when it needs to be serviced..

## EDUCATION CONNECTIONS

- If you're interested in the study of motion, and force through human and economic resources, you may enjoy **mechanical engineering!**
- Get your **mechanical certificate** if you're interested in brake systems, engine repair, electrical systems, and more!
- **Study heating, air conditioning, and refrigeration mechanics (HVAC)** to inspect, repair, or replace elements in a system's pump, motor, fan, thermostat, or switches.
- Learn **diesel mechanics** to perform maintenance and repairs on heavy equipment.

Written Iowa 4-H Youth Development 2013. Revised in 2019 by Bonnie Dalager, 4-H Product Development Specialist, and Payton Sash, 4-H Student Office Assistant, Iowa State University Extension and Outreach.