MECHANICS & DESIGN PROJECT

Are You Into It?
The Mechanics & Design project examines a range of areas linked to practical applications of power, energy, and electricity as well as structural and mechanical engineering. The project includes practical applications based on understanding the basic principles of these fields. Experience the technology firsthand while increasing technical and scientific literacy, communications and decision-making skills.

- Develop an interest in and understanding of science, engineering, technology and the basic principle and theories underlying technologies’ use of power, energy and electricity, as well as structural and mechanical engineering.
- Develop problem solving and logical reasoning skills.
- Improve communication and teamwork skills by working the way scientists and engineers do - in teams.
- Develop responsible attitudes about science and technology and how they relate to the real world and people’s lives.
- Gain experience in problem solving and decision-making using science process skills.
- Develop knowledge and skills related to the design, construction, and repair of structural and mechanical technologies.

Here’s what you can do all year!

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- Learn about safety and equipment used in welding, engines and motors
- Learn about electricity and electronics
- Identify and distinguish between small engines and motors in your home
- Discover how engine work and how they are used in different machines
- Learn about different methods of welding and what materials they are for
- Learn the different types of circuits and how to construct each type
- Learn about the parts of your lawn mower and how to make adjustments to its systems
- Diagnose an engine problem how to repair it
- Experiment with different welds and beads for joints for constructing a product
- Discover how electrical systems supply power to your home
- Restore, repair, or modify an engine or drive system of a tractor
- Design and build a machine to address a need in your home or farm

Leadership
- Organize a safety workshop
- Organize a lawnmower tune-up clinic
- Host a safe/responsible driving presentation
- Give a demonstration on winter driving tips

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

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

Learn more at www.extension.iastate.edu/4h/projects/mechanics or contact your county ISU Extension Office
Take mechanics & design further!

Here are other opportunities to explore mechanics & design:

- Visit companies that have mechanical departments and use online mechanics simulations to learn more
- Start a “Fix This” competition in your club or county or host an antique tractor show
- Explore apprenticeships and internships to learn more about career options or start your own business
- Contact your county ISU Extension Office for local workshops, activities, and events related to mechanics or engineering design. [http://www.extension.iastate.edu/content/county-offices](http://www.extension.iastate.edu/content/county-offices)
- Meet others interested in mechanics and design. Check out 4-H camps and the Iowa 4-H Center. [http://www.extension.iastate.edu/4h/camping](http://www.extension.iastate.edu/4h/camping)
- Study an area of environmental science and enter the State Science and Technology Fair of Iowa. [http://www.sciencefairofiowa.org/](http://www.sciencefairofiowa.org/)
- Is it county fair time? Consider taking an exhibit, a piece of your project learning to the fair for judging and to show off what you have learned. It might get selected to go to the Iowa State Fair. [http://www.extension.iastate.edu/4h/statefair](http://www.extension.iastate.edu/4h/statefair)
- Attend Iowa 4-H Youth Conference and participate in workshops, motivational speakers and a community service project, bringing ideas back to your community. [http://www.extension.iastate.edu/4h/StateConference/](http://www.extension.iastate.edu/4h/StateConference/)
- Interested in a college education in fields related to mechanics or engineering? Schedule a visit with Iowa State University to explore those majors. [www.iastate.edu](http://www.iastate.edu)

### Resources

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<th>4-H Resources</th>
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<th>Record Keeping</th>
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<td>- Electricity <a href="http://www.4-hmall.org/Category/4-hcurriculum-electric.aspx">http://www.4-hmall.org/Category/4-hcurriculum-electric.aspx</a></td>
<td>- “How-to” Books and equipment/engine magazines</td>
<td>- 4-H Yearly Summary (4H 0096)</td>
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<td>- Exploring 4-H Tractor Restoration Opportunities <a href="https://store.extension.iastate.edu/ItemDetail?ProductID=530">https://store.extension.iastate.edu/ItemDetail?ProductID=530</a></td>
<td>- Shop and service Manuals for models you are working on</td>
<td>- Basic 4-H Project Record (4H 0096A)</td>
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<td>- Univ. of Wisconsin <a href="http://4h.uwex.edu/onlinepro/electricity.cfm">http://4h.uwex.edu/onlinepro/electricity.cfm</a></td>
<td>- Advanced 4-H Project Record (4H 0096C)</td>
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<td>- Electrical Worker’s Union <a href="http://www.ibew.org/">www.ibew.org/</a></td>
<td>- Recordkeeping Self-Evaluation (4H 98, PDF)</td>
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<td>- The Iowa Energy Center <a href="http://www.energy.iastate.edu">www.energy.iastate.edu</a></td>
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