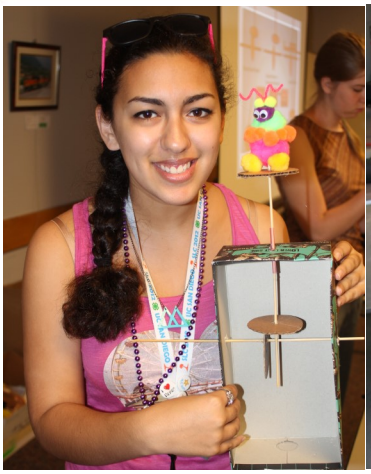
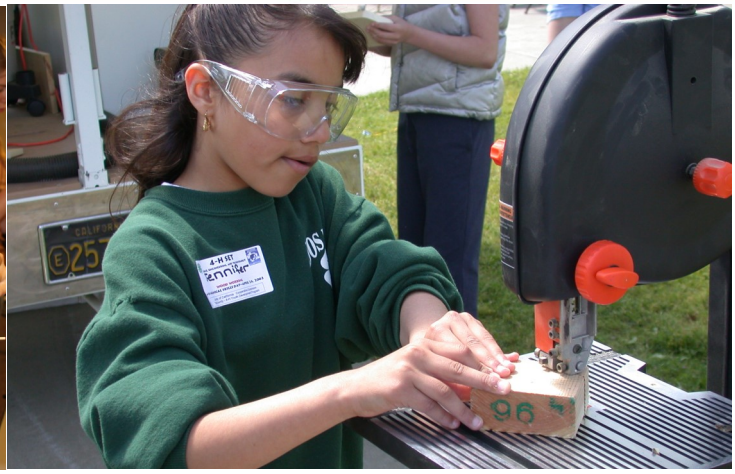
CALIFORNIA 4-H PROJECT SHEET

4-H Engineering Project





Engineering is a systematic and iterative approach to addressing human needs and wants, by designing, building, and testing tools, processes, and systems. Through engineering projects, youth learn about the iterative engineering design process, attributes of design, impacts of systems, and effects of technology on the environment.

- Identify and define a problem, its constraints, and goals/criteria a solution must meet
- Develop possible solutions; test and optimize the design solution

Starting Out *Beginner*	**Learning More** *Intermediate*	**Exploring Depth** *Advanced*
• Experience the engineering design process • Record designs and testing in an engineering notebook • Learn about the types and safety considerations of tools and equipment. • Learn about form and function and the role of materials in engineering design	• Learn about engineering fields and careers • Make connections between human issues and how engineering can help provide solutions • Start to think about systems thinking and how individual parts of a system work together • Learn about the	• Identify real-life issues and their constraints and design a tool to help solve the issue • Explore engineering in context of disciplines: agriculture, energy, medical, and others • Explore the interactions of technology (created using engineering) and their effects on the world

The activities above are ideas to inspire further project development. This is not a complete list.

4-H THRIVE

Help Youth:

Light Their Spark

A spark is something youth are passionate about; it really fires them up and gives them joy and energy. Help youth find

Flex Their Brain

The brain grows stronger when we try new things and master new skills. Encourage youth effort and persistence to

Reach Their Goals

Help youth use the GPS system to achieve their goals.

Goal Selection: Choose one meaningful, realistic and demanding goal.

Pursue Strategies: Create a step-by-step plan to make daily choices that support your goal.

Shift Gears: Change strategies if you're having difficulties reaching your goal.

Reflect

Ask project members how they can use their passion for this project to be more confident, competent and caring. Discuss ways they can use their skills to make a contribution in the

Expand Your Experiences!

Science, Technology, Engineering, and Mathematics

- Go on a field trip of an engineering company or organization
- Build your own measurement tool in order to conduct a scientific investigation
- Research and discuss with other members the relationship between science and

Healthy Living

- Learn about the safety of a tool or equipment and present to the other project members
- Identify a health-related need in your home or community and then design,

Citizenship

- Select one tool and trace its lineage. When was that tool first introduced? Who created it and for what purpose? What affect has adoption of that tool had on society?

Leadership

- Serve as a Junior or Teen Leader for the Engineering project
- Lead an engineering activity at a 4-H club meeting for younger members

Connections & Events

Presentation Days – Share what you've learned with others through a presentation.

Field Days – At these events, 4-H members may participate in a variety of contests related to their project area.

Contact your county 4-H office to determine additional opportunities available, such as a field day.

Curriculum

- 4-H Robotics: Engineering for Today and Tomorrow www.4-h.org/robotics/
- TechXcite: Discover Engineering techxcite.pratt.duke.edu/
- 4-H The Power of the Wind www.4-h.org/curriculum/wind/
- Design It! npass2.edc.org/resources/design-it
- Exploratorium, the Tinker-

4-H Record Book

4-H Record Books give members an opportunity to record events and reflect on their experiences. For each project, members document their experiences, learning and development.

4-H Record Books also teach members record management skills and encourage them to set goals and develop a plan to meet those goals.

Resources

- National 4-H Engineering & Technology www.4-h.org/youth-development-programs/4-h-science-programs/engineering-technology/
- International Technology and Engineering Educators Association (ITEEA) http://www.iteaconnect.org/
- 4-H Clover Safe Notes safety.ucanr.org/4-H_Resources/
- Design Squad (PB) http://pbskids.org/designsquad
- Maker Education Initiative http://www.makered.org/
- eGFI: Dream Up the Future http://www.egfi-k12.org/
- Engineer Girl http://www.engineergirl.org/
- Autodesk Education http://www.autodesk.com/education/student-software
- National Center for Women and Information Technology https://www.ncwit.org/
- Techbridge: Inspire a girl to

ENGINEERING

University of California Agriculture and Natural Resources

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