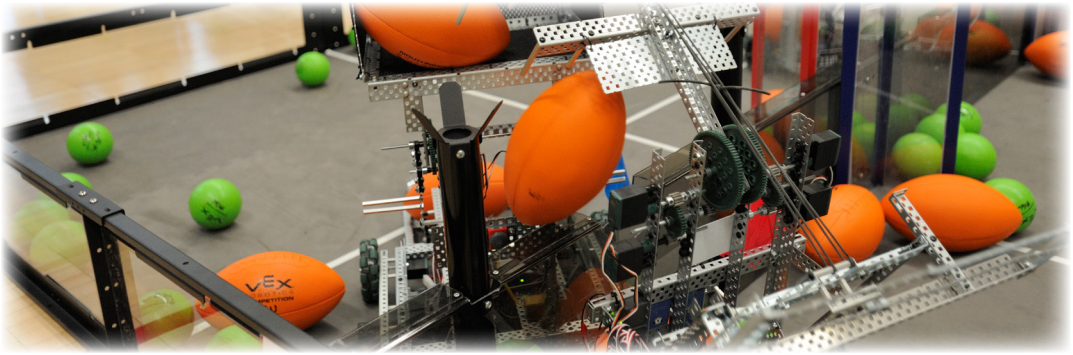
MICHIGAN STATE UNIVERSITY | Extension

18 U.S.C. 707

SNAPSHOT 4H1623

# 4-H Robotics Project



## WHAT'S IT ALL ABOUT?

**The 4-H Robotics Project provides youth the opportunity to explore elements of engineering and design in a fun and challenging way.**

- Explore the use of robots and the technology that makes them work.
- Learn engineering and design skills.
- Work as an individual or in teams to build a robot and compete in design challenges.

## THE BIG PICTURE

### Starting out:

- Identify how robots are used today.
- Explore the benefits of robots.
- Learn about remotely operated vehicles and discover how and where they function.
- Understand the basic elements of mechanics such as the role of the lever and the gear.
- Learn about sensors and discover how they are used to create responses.
- Learn about movement and friction.
- Discover scientific inquiry and engineering design processes.

### Learning more:

- Learn about robotic platforms and power.
- Understand physical science and mathematics concepts when designing robots.
- Learn and practice engineering design principles.
- Discover circuits and electronic systems.
- Work with simple tools and parts to build a basic robot.
- Form an idea and work through the scientific method.

### Expanding horizons:

- Practice how to develop and implement the best possible solution to a problem.
- Research the influence of technology on society.
- Apply scientific habits of observation, computation and evaluation.
- Engineer your own design challenge and build a robot up to the task.
- Identify questions that involve data collection and build a robot that can meet the need.
- Explore related careers in these fields.

## CURRICULA & RESOURCES

### Curricula — Other States

- Gear-Tech-21 Geospatial and Robotics Technologies for the 21st Century (University of Nebraska-Lincoln): *http://4hset.unl.edu/4hdrupal/*
- NeXT Technology (Ohio 4-H Youth Development): *http://www.ohio4h.org/4-h-science/4-h-robotics*
- Robotics (Iowa State University Extension): *http://www.extension.iastate.edu/4h/projects/robotics*

### National 4-H Curricula

- 4-H Robotics: Engineering for Today and Tomorrow: *http://www.4-h.org/youth-development-programs/4-h-science-programs/engineering-technology/4-h-robotics-program/*
- National 4-H Robotics website: *http://www.4-h.org/resource-library/curriculum/4-h-robotics/*

# 4-H Robotics Project Snapshot

## FOCUS ON ROBOTICS

### Science

- Learn about past and present technologies.
- Understand the importance of mathematics.
- Explore engineering and design principles.

### Communication

- Demonstrate how to make a simple robot.
- Hold a workshop to teach others how to build a robot.
- Interview an engineer.

### Citizenship & Leadership

- Complete a robotics-based service-learning project within your community.
- Demonstrate robotics to residents of a retirement community or assisted living center.
- Visit a factory that uses robots to create a product.

### Life Skills

- Use critical-thinking, problem-solving and decision-making skills to help you make good decisions about project management.
- Keep records on your project such as expenses and income.
- Practice personal resiliency through successes and challenges in your robotics project.

## HOW CAN YOU GET INVOLVED?

- Check out the National 4-H Robotics resources.
- Find an engineer in your community to be your mentor or join a 4-H Robotics club.
- Talk to local companies that use robotics and discover ideas for projects and information on the use of robots in real-world situations.
- Find examples of robots and make a poster or display depicting the ones you find.
- Research which companies use robots and discover their purpose.
- Seek out local or national robotic competitions, tournaments or demonstrations.
- Contact your local Michigan State University (MSU) Extension office for workshops, activities and events.
- If you are interested in a college education in science, technology and engineering, visit MSU's website at *www.msu.edu* to explore those majors.

Adapted with permission from "*4-H Science, Engineering and Technology Project*," by Iowa State University Extension, 2011, Iowa 4-H Project Hot Sheet. Retrieved from *http://www.extension.iastate.edu/4h/projects/*