

## **SECTION 4304 4-H Technology Exhibits**

- The 4-H technology exhibits are open to all grades. They will be judged separately in two (2) grade groups. **Juniors – grades 3-7 and Seniors – grades 8-12.**
- Every exhibit must be labeled on the back with the following information: Name, Club, County, Grade before September 1 and date poster or exhibit was made.
- Copy written material such as professional photos, books, publications or items on the internet **should not be used** as original.
- Exhibits displayed as posters must be constructed on poster board 14" x 22" (1/2 of a poster board). They may be horizontal or vertical. Posters will be judged on 1) educational idea portrayed, 2) public appeal, and 3) creative and original ability presented. Copyrighted or trademarked cartoon characters or other designs must not be used due to copyright restrictions.
- For poster displays purposes, exhibitors are encouraged to laminate or cover all posters with clear plastic film. **Text of posters should be readable from at least 10 ft. away.**
- **Awards:** Ribbons will be awarded to the top 10 in each class. Premiums will be paid on the top 3 places in **Class 01 through Class 34:**  
**Juniors - Grades 3-7 Seniors-Grades 8-12**

**Flat flyer (one-sided) designed by the exhibitor to promote a club or county 4-H educational program or activity.** Computer generated flat flyer (8 ½" x 14" or 8 ½" x 11"). Flat flyers should be securely attached to an appropriately sized poster board.

1. Juniors
2. Seniors

**Brochure, card or invitation related to 4-H** (may be double-, tri-, or four-fold measuring 8 ½" x 11" or 8 ½" x 14 before folding.) Attach two (2) flat copies of the brochure (one side showing the front and the other side showing the back of the brochure) to an appropriately sized poster board no larger than 14" x 22" – ½ of a poster board. Attach a large envelope to the back of the poster board and insert a folded copy of the brochure.

3. Juniors
4. Seniors

**PowerPoint Presentation related to 4-H** (Can be PowerPoint, Google slides or any other presentation program.) Presentation should either promote 4-H or educate about a 4-H project. Presentations should include an official 4-H Clover or mention 4-H. Presentation entry includes a printout of at least five (5) slides and script/presentation notes in a folder or notebook. All PowerPoint presentations should be mounted on a free standing display board not to exceed 3' x 4' when the sides are extended for display. Commercially available "Science Fair Presentation boards" are encouraged. First place exhibits in each class will be displayed. Second place and sub-sequential exhibits may be displayed based upon space available and judges'/committees' discretion.

5. Juniors
6. Seniors

**Digital Media for a group or club project** - Submit a video (maximum of 3 minutes) designed for social media use on STEM projects. The video must be in an .MP4 format and submitted on a flash drive. Video may only contain first names of the participants and participants must have a signed media release form on file in their county 4-H office (found on the 4-H enrollment card).

7. Group Media

**STEM Career Poster** 4-H members should research careers in STEM before developing their poster exhibit. Posters should highlight the variety of STEM related careers and follow the Technology Exhibit poster guidelines and criteria.

8. Junior Poster (grades 3-7)- Draw a Scientist
9. Senior Poster (grades 8-12)- Careers in STEM

### **Global Positioning Systems (GPS)/Geographic Information Systems (GIS) Exhibits**

- 4-H Youth will learn about Geographic Information Systems (GIS) concepts by collecting data on a location, describing the attributes.
- Youth will learn about geospatial technology applications and future career opportunities by working with local government agencies and project partners in their own communities.
- Increased youth involvement in community service and awareness projects that impact local communities by enhancing economic and community development.
- The 4-H GPS/GIS exhibits will be judged in two (2) grade groups. Juniors, grades 3-7; Seniors – grades 8-12.
- Every exhibit must be labeled on the back with the following information: Name, Club, County, Grade and date poster, map or exhibit was made.
- Posters/Maps must be 14" x 22" – ½ of a poster board. Exhibitors are encouraged to laminate all posters or cover them with clear plastic film. Maps may be affixed to poster board. The map itself doesn't have to be the full 14" x 22".
- Displays must be free-standing and not be larger than 3' x 4' (width x depth) with sides extended for display.

**Display illustrating how GPS works**, including the user, control and space segments of the system.

10. Juniors

### **Display illustrating how GPS has been used to improve society**

11. Seniors

**Geocache box**. Exhibit would include geocache box with contents, description & photograph of the location in which the box will be located. (Check <https://www.geocaching.com/play> for instructions on placing and describing)

12. Juniors

13. Seniors

**Hand drawn map**. Map can either be informational or directional. Attach a one (1) page explanation of the purpose for the map.

14. Juniors

15. Seniors

**Computer generated map**. Map can be either informational or directional. Attach a one (1) page explanation of the purpose for the map.

16. Juniors

17. Seniors

### **4-H Robotics**

- The goal of the 4-H robotics program is for 4-H members to explore science, technology and engineering through designing and building a functioning robot.
- The 4-H robotics exhibits are open to all grades. They will be judged separately in two (2) grade groups. Juniors and Seniors. **Juniors - grades 3-7; Seniors – grades 8-12.**
- Every exhibit must be labeled on the back with the following information: Name, Club, County, Grade and date poster or exhibit was made.
- Attach a 3"x 5" index card to each robot/exhibit, explaining:
  - Construction material, how constructed and goal of project.
  - Year in project
  - Grade of Member
  - Whether or not made from kit
  - Other pertinent information
- Each exhibit should have a one (1) page report explaining the function, purpose and construction of the robot.
- Displays must be free standing and are limited to 3' x 4' (width x depth) when sides are extended for display.

### **Programmable or Remote Controlled Robot**

- 18. Juniors
- 19. Seniors

### **Display with photographs and explanation of a member developed robot which is not available for exhibit.**

- 20. Juniors
- 21. Seniors

### **Projects Group Developed by two (2) or more 4-H members working together (Include all 4-H members' information involved on index card)**

- 22. Programmable or Remote-Controlled Robot
- 23. Display with photographs and explanation of a member developed robot which is not available for exhibit

### **Engineering Design Challenges**

#### **Criteria:**

Engineering design challenges are intended to encourage 4-H members to use the Engineering design process to create their own projects. These projects should include an engineering notebook, journal or description which answer the following questions about their project. Projects without an engineering notebook will be judged accordingly. Projects with notebooks will place before projects without notebooks, journals, or descriptions.

- What is the challenge or task of your project (Example: Throw a marshmallow six feet, incorporate technology into clothing, create alternative energy, design and build a rubber band powered car, etc.)
- Draw your design
- How did you test your design?
- What were the results?
- How did you change your design to improve it?
- Did you retest it? Did the results improve?
- Describe your final design and does it work?

Engineering Design Challenges will be judged based on creativity, design, function, and recordkeeping (journal or engineering notebook).

**Juniors - grades 3-7; Seniors – grades 8-12.**

### **Marshmallow catapult challenge design task**

Design a trebuchet-style swing arm catapult. It may be similar to a teeter-totter or swing set. The beam (arm) is able to swing (go up and down). The arm of the catapult must be adjustable from the center to an offset (One side of the beam is longer from center pivot point.). Use at least five (5) different types of materials or parts (craft sticks, brads, dowels, etc.). Use weights and gravity as the power source. Catapult cannot be any larger than a 3 foot cube (3' X 3' X 3')

Launch a marshmallow at least six (6) feet. A journal or engineering notebook should be included to describe the creation, purpose and function of the device. Explain how you built and tested your catapult. Chart your marshmallow launches.

Reference: National 4-H Curriculum, Junk Drawer Robotics, Level I <https://shop4-h.org/products/junk-drawer-robotics-curriculum-1-give-robotics-a-hand>

- 24. Juniors
- 25. Seniors

### **Alternative Energy Design Challenge**

**Design and build a device to utilize wind, solar, or water power. Commercially available parts are acceptable but the majority of the project must be homemade by the member. Must fit entirely within a 12-inch cube (12"X12"X12"). A journal or notebook should be included to describe the creation, purpose and function of the device. References for this project may include but are not limited to:**

#### **Wind Power**

- 4-H Power of Wind Curriculum: <https://shop4-h.org/products/power-of-the-wind-curriculum-youth-guide>

### Solar Power

- Solar Powered Housed Activity <https://shop4-h.org/products/solar-powered-houses-activity-kit>
- Solar Powered Car Activity <https://shop4-h.org/products/solar-powered-car-activity-kit>

26. Juniors

27. Seniors

### Wearable Technology Design Challenge

**Design a piece of wearable technology. Commercially available parts are acceptable but the majority of the project must be homemade by the member. A journal or notebook should be included to describe the creation, purpose and function of the device. Resources for this project may include but are not limited to:**

References:

- WearTec Curriculum Series books 1-4: <https://shop4-h.org/products/weartec-1-circuitry-leaders-guide>

28. Juniors

29. Seniors

### Rubber Band-Powered Vehicle Design Challenge

**Design a wheel-driven vehicle, powered only by one rubber band (size #64 approx. ¼" wide by 3½" long by 1/32" thick.), which will transport a one-pound "load" (box of baking soda approx. size: 3½" x 4½" x 2") at least 9 feet (on a smooth flat floor) while remaining within the boundaries of a 3 ft. wide parallel track (marked off with masking tape). Speed is not a criteria.**

There are no restrictions on materials, size, weight or number of wheels. However, the only energy source permitted is the elastic energy of one rubber band. Commercially assembled vehicles are NOT permitted. However, commercially manufactured components may be used as parts of the vehicle. The vehicle must be self-starting (i.e., no pushing, external power starts, etc.). Propulsion of the vehicle must be through the wheels (i.e., no propellers, no launching mechanism). Transferring the energy of the rubber band to wheels via gears, fly wheels, etc., is encouraged. No remote-control devices are permitted.

**A journal or engineering notebook should be included to describe the creation, purpose and function of the device. Explain how you built and tested your vehicle and if you made any modifications. Chart or graph collected data and explain how you measured improvements in your engineering notebook or journal.**

30. Juniors

31. Seniors

### The Future of Agriculture Research Challenge Displays

The future of agriculture research displays will illustrate current research and forward/futuristic thinking that is changing the field agriculture and agricultural based careers. 4-H members will research current trends, future thoughts and ideas for continuing to effectively feed the world. These projects should have a minimum of three scholarly references identifying where and when the information was published.

These projects may:

- Describe the challenging need for increased food production for a growing population
- Describe a new agricultural production technique or an emerging agricultural technology that will enhance or improve our agricultural and food production systems,
- Illustrate a new vision for the future of agriculture
- Describe new STEM-based careers in agriculture.

Research displays should use research-based information and resources to answer questions similar to the following, "What will the future of Agriculture look like?", "How will agriculturalist feed an ever-growing population?" or "What are future careers in agriculture?"

All research displays should be mounted on a free-standing display board not to exceed 3' x 4' when the sides are extended for display. Commercially available "Science Fair Presentation boards" are encouraged". First place exhibits in each class will be displayed. Second place and sub-sequential exhibits may be displayed based upon space available and judges'/committees' discretion. Displays should be readable/understandable from a distance of 10 ft. A complete research report should be included with the display in a notebook.

32. Juniors

33. Seniors