

STEM - ROBOTICS

PREMIUMS: Purple-\$3.00; Blue-\$2.00; Red-\$1.50; White-\$1.00

DIVISION 861 - ROBOTICS

This category involves the many different aspects of Robotics. Participants will learn more about how robots are designed and developed as well as the mechanical and electronic elements of robots. Involvements in STEM Robotics gives participants a first-hand experience in modern technology.

The name and county of each exhibitor should appear separately on the back of each board, poster or article and on the front cover of the notebooks so the owner of the exhibit may be identified if the entry tag is separated from the exhibit.

Reports should be written using the scientific method whenever possible (Background the Question or hypothesis, what you plan to do and what you did, Method used and observations, Results: what you learned). All reports should be computer generated and enclosed in a clear plastic cover. The reports should be attached securely to the display. Posters can be any size up to 28" x 22" when ready for display. Example: tri-fold poster boards are not 28" x 22" when fully open for display.

- Team Entries: To qualify for entry at the Nebraska State Fair, team materials entered in robotics classes that are clearly the work of a team instead of an individual must have at least 50% of all team members enrolled in 4-H. Additionally, all enrolled 4-H members on the team should complete and attach an entry tag to the materials. A supplemental page documenting the individual contributions to the project should be included. The entry will be judged as a team, with all team members receiving the same ribbon placing.
- Creating a video of your robot in action would be helpful for the judges but is not mandatory. Videos should be uploaded to a video streaming application and exhibitors should provide a hard copy QR code for viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing.

Scoresheets, forms, contest study materials, and additional resources can be found at <https://go.unl.edu/ne4hrobotics>

- H861001* **ROBOTICS POSTER** – Create a poster (28" x 22") communicating a robotics theme such as "Robot or Not", "Pseudocode", "Real World Robots", "Careers in Robots" or "Autonomous Robotics", "Precision Agriculture", or a robotic topic of interest to the 4-H'er. (SF236)
- H861002* **ROBOTICS NOTEBOOK** - Explore a robotics topic in-depth and present your findings in a notebook. Documentation should include any designs, research, notes, pseudocode, data tables or other evidence of the 4-H'ers learning experience. The notebook should contain at least three pages. Topics could include a programming challenge, a programming skill, calibration, sensor exploration, or any of the topics suggested in Class 1. (SF237)
- H861004* **ROBOTICS/CAREERS INTERVIEW** - Interview someone who is working in the field of robotics and research the career in robotics. Interviews can either be written or in a multimedia format such as a short video. Videos should be emailed to spritchard1@unl.edu by July 3, 2024 OR videos can also be uploaded to a cloud sharing service and exhibitors MUST provide a hard copy QR code for viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing. Written interviews should be in a notebook. Written reports should be 3 to 5 pages, double spaced, 12 point font, and 1" margins. Multimedia reports should be between 3 to 5 minutes in length. (SF239)
- H861005* **ROBOTICS SENSOR NOTEBOOK** – Write pseudo code with a loop which includes at least three sensor activity. Include the code written and explain the code function. Multimedia presentations should be 3 to 5 minutes in length. Multimedia presentations and videos should be emailed to spritchard1@unl.edu by July 3, 2024 OR can also be uploaded to a video streaming application and exhibitors MUST provide a hard copy QR code for judging access and viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions. (SF241)
- H861007* **KIT LABELED ROBOT (Cannot be free programmed) and Notebook** - This class is intended for explorations of robotic components such as arms or vehicles OR educational kits marketed as robots that do not have the ability to be programmed to "sense, plan and act." The exhibit should include a notebook with the robot the youth has constructed. Included in the notebook should be:
- a. A description of what the robot does
 - b. Pictures of programs the robot can perform
 - c. Why they chose to build this particular form
 - d. How they problem solved any issues they might have had during building and programming
- A picture story of assembly is recommended. If robot is more than 15" wide and 20" tall they may not be displayed in locked cases. (SF243)

H861008* **3D PRINTED ROBOTICS PARTS** - This class is intended for youth to create parts, through 3D printing, to help create their robot or aid the robot in completing a coded function. Project should include notebook describing the process used to create the project describe the success of your designed piece (did it work), intended use of the product and the modifications made to the item. (SF244)

- Entries are not eligible for State Fair.

H861009 **3D/NON-MOBILE ROBOT** - Construct out of items found around the home. Provide a short description of your robot, including steps you took to construct the robot and items used.

H861010 **ROBOT/STEM ART** - The purpose of this class is to allow artistic exhibits that contain a science and technology theme. This class can use any form of medium. Examples might include paintings, drawings, photographs, or songs or poems written by the exhibitor. Entries must be appropriate for fair display and no larger than 24" x 24". For example: paintings or photographs should be displayed in notebook format or mounted on a sturdy display panel. All entries must include a title and brief explanation of the purpose or message (what is the exhibit meant to show).

H861011 **LEGO INITIAL** - Construct the first letter of your first or last name out of Legos. Entries must not reach over 12" in height and 18" in width. Can be two or three dimensional. If two dimensional, make sure the letter is securely fastened to a poster or wood board. If 3D, please place initial on a sturdy surface and make sure it is able to stand on its own. Include a brief explanation of the exhibit.

H861012 **OTHER/CATCH ALL** - Other robotics exhibit that does not fit into any other class.

H861013 **FIRST LEGO LEAGUE EXHIBIT** - Any exhibit that showcases member participation in a First Lego League Season. Exhibit examples: poster board, scrapbook, brochure, etc.

The 4-H Robotics Showcase is an opportunity for youth to showcase their Science, Technology, Engineering, and Math (STEM) talents by presenting their robot's design and programming skills to judges and members of the public. All youth participants have the ability to interact with the judges and run the programs on the robot exhibit.

- Participants may enter as an individual or as a team. A team consists of 2-4 individuals.
- Participants must be enrolled in a STEM robotics project during the current 4-H year.
- Participants should arrive at least 15 minutes prior to your assigned time to set up.
- Participants must wear their 4-H t-shirt during the contest.

Age Divisions:

- Junior: Ages 8-10
- Intermediate: Ages 11-13
- Senior: Ages 14-18

Scoresheets, forms, contest study materials, and additional resources can be found at <https://go.unl.edu/ne4hrobotics>.

F500037* **ROBOTICS VIDEO** - This class should be displayed in a notebook. The notebook should include a video clip on a CD/DVD that demonstrates the Robot performing the programmed function. Include your pseudo code and screenshots of the actual code with a written description of the icon/command functions. Videos should be emailed to spritchard1@unl.edu by July 3, 2024, OR videos can also be uploaded to a video streaming application and exhibitors MUST provide a hard copy QR code for viewing. Exhibitors should test their codes or links on several devices to check for appropriate permissions for public viewing. (SF238)

F500038* **BUILD A ROBOT (MAY USE KIT)** - Include a robot and notebook including the pseudo codes for at least one program you have written for the robot, the robot's purpose, and any challenges or changes you would make in the robot design or programming. If robot is more than 15" wide and 20" tall, they may not be displayed in locked cases. We recommend that you submit the project under class H861003 - Robotics Video. Junk Drawer Robotics do not qualify. (SF243)