

STEM ROBOTICS (DEPARTMENT H)

Participants will learn more about how robots are designed and developed as well as the mechanical and electronic elements of robots.

Each 4-H/FFA exhibitor may enter up to 3 **different** items in each class.

GENERAL INFORMATION - 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 owner of 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 observation, 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.

ROBOTICS - DIVISION 861

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,

Class:

1. *ROBOTICS POSTER - Create a poster (14" x 22") communicating a robotics theme such as "Robot or Not", "Pseudocode", "Real World Robots", "Careers in Robots", "Autonomous Robotics", "Precision Agriculture" or a robotic topic of interest to the 4-H'er.

2. *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.

4. *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 uploaded to a cloud service. 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.

5. *ROBOTICS SENSOR NOTEBOOK - Write pseudo code which includes at least three sensor activity. Include the code written and explain the code function. Codes can be submitted as a multimedia format uploaded to a cloud sharing service.

7. *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 (1) a description of what the robot does, (2) pictures of programs the robot can perform, (3) why they chose to build this particular form, and (4) 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.

8. *3D PRINTED ROBOTICS PARTS – This class is intended for youth to create parts through 3D printing that 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.