

DEPARTMENT – BUILDING EXHIBITS

SECTION –STEM-ROBOTICS (Must be enrolled in STEM - Robotics)

SECTION - 4-H SPACETECH - ROBOTICS

1. Read General and Special Rules. Violation of any of the following rules may result in disqualification. All decisions will be made by a county agent and their decision is final.
2. Member must be currently enrolled in STEM - Robotics.
3. Each exhibitor may enter one robot per class. Exhibit must have been constructed and/or completed during the current 4-H year. Only top blue or purple ribbon robot exhibits which meet State Fair guidelines should be selected for entry at the State Fair.
4. Each robot must be free-standing, without the need for additional supports in order to be moved or exhibited. Each exhibit must include a robot. Information packets are not a sufficient exhibit.
5. Robots must have automated articulated structures (arms, wheels, grippers, etc.). Game consoles that display on a screen are not considered robots and should either be entered in computer systems division or energy management project. Robots requiring no assembly, just programming, such as Ozobots, are considered computer systems projects as the skill is focused on the programming not on the construction of the robot.
6. Robot dimensions should not exceed 2 feet high, by 2 feet wide, by 2 feet deep. Weight may not exceed 15 pounds. If displayed in a case (not required or encouraged) the outside case dimensions may not be more than 26 inches in height, width, or depth.
7. Materials including but not limited to obstacles, spare batteries, and mats for testing the robot may be placed in a separate container, which is not included in the robots dimensions, that container may not be larger than 576 cubic inches as measured along the outside of the container. (Examples: 4"X4"X36" or 4"X8"X18" or 6"X6"X16) The container, if used, and/or any large objects (such as mats or obstacles) should be labeled with the exhibitor's name(s) and county or district.
8. All electric components of the robot must be adequately covered or concealed with a protective enclosure. Paper is NOT considered an adequate enclosure or covering for electrical components.
9. Robots may be powered by an electrical, battery, water, air or solar source only. Junk Drawer robots may be powered by a non-traditional power source. Robots powered by fossil fuels/flammable liquids will be disqualified. Robots that include weaponry of any kind will be disqualified. Weaponry is defined as any instrument, possession or creation, physical and/or electrical that could be used to inflict damage and/or harm to individuals, animal life, and/or property.
10. Remote controlled robots are allowed under certain conditions provided that the robot is not drivable. Remote controlled cars, boats, planes and/or action figures, etc. are not allowed. Robotic arms (hydraulic or electric) are allowed. A remote is allowed provided more than a single action happens when a single button is pressed on the remote, for example "a motor spins for 3 seconds, at which point an actuator is triggered, then the motor spins for 3 more seconds."
11. Each robot must be in working condition. The judges will operate each robot to evaluate its workmanship and its ability to complete the required tasks. In the event the robot uses a phone, tablet, or similar device for programming AND control of the robot, a video will be used to evaluate the working condition of the robot.
12. Each exhibitor is required to complete the "4-H STEM Robotics Exhibit Information Form" which is available through the Extension Office or at www.STEM4KS.com. This form must be attached to the outside of a 10" x 13" manila envelope. For the LVCO Fair, the construction plans must also be included in this manila envelope. Must comply with additional

instructions if selected for the State Fair.

1. The exhibit must include clear, detailed, step-by-step written instructions for operation, construction plans, and one to three pages of project photographs. In addition, a 5 minute video presentation placed on a CD, DVD, USB drive, or similar removable storage device, if applicable. For robots that can be programmed, robot programming information must be included. This information should be placed inside the 10" x 13" manila envelope mentioned above. The exhibitor may enter their energy management project listed under the electric program if the exhibitor so chooses. No exhibitor will be allowed to set up their robot in person. Robot programming information can be, but not limited to, source code, block diagrams, screen captures of the coding window, and other images that show the programming logic used.
2. In the event that the robot uses a device like a phone, iPad, or tablet for programming AND operation, DO NOT include the device (phone, tablet, etc.). The device's safety cannot be insured. Instead record a video demonstrating the instructions included for your robot. It should show, setting up the robot, starting the robot, the robot executing its task, and powering off the robot, just like the instructions are written.
3. Creativity, workmanship, and functionality will be strong criteria in judging the "Robot designed by Exhibitor" classes. All robots should have a purpose or intended function, examples include, but are not limited to: following a line, sweeping the floor, solving a rubix cube, sorting colors, or climbing stairs.
4. Exhibitors name(s) and county must be tagged or labeled in a prominent location on the robot.
5. See the last section for full details about exhibiting posters, display boards and notebooks.
6. If a safety violation is noted by the judges, superintendents, or other staff, the exhibitor's exhibit, at the judges' discretion, will receive a participation ribbon.

CLASSES – *Division A- NOVICE- Ages 7 & 8. (Div A is not eligible for state fair)*

5505: NOVICE – Robot made from a commercial (purchased) kit

5506: NOVICE - Robot designed and constructed by exhibitor

Robot must not be a mere modification of an existing robot kit or plan.

5507: NOVICE - Programmable robot made from a commercial (purchased) kit

5519: NOVICE – Robot designed and constructed by exhibitor or from a commercial kit, that is operated by a remote controlled device

5543: NOVICE - Junk Drawer Robotics – based curriculum robot

Division B – INTERMEDIATE – Ages 9 - 13

5509: INTERMEDIATE - Robot made from a commercial (purchased) kit (No programming, Just assembly)

5510: INTERMEDIATE - Robot designed and constructed by exhibitor

The robot must not be a mere modification of an existing robot kit or plan.

5511: INTERMEDIATE - Programmable robot made from a commercial (purchased) kit

5544: INTERMEDIATE - Junk Drawer Robotics

5546 :INTERMEDIATE – Robot designed and constructed by exhibitor or from a commercial kit, that is operated by a remote controlled device.

Division C - Senior – Ages 14-18

5513: SENIOR - Robot made from a commercial (purchased) kit (No programming, Just assembly)

5514: SENIOR - Robot designed and constructed by exhibitor

The robot must not be a mere modification of an existing robot kit or plan.

5515: SENIOR - Programmable robot made from a commercial (purchased) kit

5545: SENIOR - Junk Drawer Robotics

5547: SENIOR –Robot designed and constructed by exhibitor or from a commercial kit, that is operated by a remote controlled device.

Division D – Team Robotics Project

5517: Robots designed and constructed by two or more

The robot must not be a mere modification of an existing robot kit or plan. The robot may be a programmable type that is made from a commercial (purchased) kit. This division is designed to encourage teamwork and cooperation among fellow 4-H STEM members. As with many high tech projects today, no one person designs and builds a robot alone. It takes the brainstorming, planning, problem solving, and cooperation of an entire team to complete a given robotics project.

4-H STEM EDUCATIONAL EXHIBITS – POSTERS, NOTEBOOKS AND DISPLAY BOARDS

Purpose: To allow 4-Hers to explore STEM outside the bounds of traditional projects for rockets, robotics, astronomy, computers and unmanned aerial systems. All posters, notebooks and display boards are listed in this section and have been removed from the individual sections to save space.

1. For notebooks, display boards, and posters, no additional exhibit information is required; no manila envelope is needed for these exhibits.
2. Exhibits in posters, notebooks and display boards must contain substantial supporting educational materials.
4. Educational display boards, posters and notebooks should be creative and showcase details about the knowledge learned in the project during the current 4-H year. Value is placed on youth who can demonstrate how their skills have increased while completing the project. Each exhibit will be judged on uniqueness, creativity, neatness, accuracy of material, knowledge gained, and content. An exhibit judging score sheet will be available at www.STEM4KS.com. For example, a rocket that may have crashed may be made into an educational display or poster that tells a great story with many lessons learned.
5. Follow copyright laws, citing all sources of information in a standard notation. Sources of information must be cited on the front of your exhibit, including all posters and educational display boards.
6. Educational displays are not to exceed a standard commercial 3'x 4' tri-fold display board. Card tables for display are not required but can be used at the county only level. Care should be taken to use durable materials that will withstand Fair conditions.
7. "Construction Kits" that are part of Educational displays must be contained in cases (tackle boxes, sealable containers, etc.) that may not be larger than 1' X 2' X 2' and must have a latch which securely keeps all components contained in the "Construction Kits". Other components are to adhere to appropriate dimensions as stated elsewhere.
8. Educational Project notebooks must be organized in a 3-ring binder.
9. Any three dimensional display exhibits may not be thicker than 1".
10. Engines and igniters in rockets ARE NOT permitted with the exhibit and constitute an immediate disqualification. This is for safety reasons and includes both spent and live engines.
11. Exhibitor's name, county or district, age, and year(s) in project must be tagged or labeled in a prominent location on the notebook and/or "Construction Kit." For educational displays and/or posters, the exhibitor's name, county, age, and year(s) in project must be tagged or labels on the back of the exhibit. Failure to label an exhibit may result in one ribbon placing deduction.
12. Exhibits should possess the following qualities (in no particular order):

A Central theme

- What you want others to learn
 - Be designed and constructed in a manner befitting the exhibit
 - Be something you are interested in
 - Be related to Astronomy, Computer Systems, Robotics, Rocketry, or Unmanned Aerial Systems and those characteristics described above
13. If a safety violation is noted by the judge, superintendent, or other staff, the exhibit will receive a participation ribbon (exhibit at the judge's discretion).

Robotics Division A - Novice – Ages 7-8 (Not State Fair Eligible)

- 5751 Robotics Educational Display
- 5752 Robotics Educational Notebook
- 5753 Robotics Educational Poster

Robotics Division B – Intermediate – Ages 9-13

- 5756 Robotics Educational Display
- 5757 Robotics Educational Notebook
- 5758 Robotics Educational Poster

Robotics Division C – Senior – Ages 14 and up

- 5761 Robotics Educational Display
- 5762 Robotics Educational Notebook
- 5763 Robotics Educational Poster

Robotics Division D – Team Robotics Project

- 5766 Team Robotics Educational Display
- 5767 Team Robotics Educational Notebook
- 5768 Team Robotics Educational Poster