

## STEM Rockets

This category gives 4-H'ers a chance to display the rockets and drones they have created. Through participation in this category 4-H'ers will show judges what they learned about and how they adapted their exhibit throughout this project. Involvement in STEM Rockets gives participants a first-hand experience in modern technology.

### **RULES:**

1. 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 the exhibit may be identified if the entry tag is separated from the exhibit.
2. **Rocket Mounting** - Rockets must be supported **substantially** in order to protect the rocket from breakage. Rockets are to be mounted on a base that has dimensions equal to or less than 12 inches x 12 inches and the base should be ¼ inch thick. No metal bases. If the rocket fins extend beyond the edges of the required base (12 inches x 12 inches), then construct a base that is large enough to protect the fins. The base size is dictated by the size of the rocket fins.
3. The rockets must be mounted vertically. Please do not attach sideboards or backdrops to the displays. In addition, a used engine or length of dowel pin is to be glued and/or screwed into the board and extended up into the rocket's engine mount to give added stability.
4. Rockets must be equipped as prepared for launching, with wadding and parachute or other recovery system. Rockets entered with live engines, wrong base size or sideboards will be disqualified.
5. **Report** - A report, protected in clear plastic cover, must include: 1) rocket specification (include original or photo of manufacture packaging stating rocket skill level), 2) a flight record for each launching (weather, distance, and flight height), 3) number of launchings, 4) flight pictures, 5) safety (How did you choose your launch site? Document safe launch, preparations, and precautions), 6) objectives learned, and 7) conclusions.
6. The **flight record** should describe the engine used, what the rocket did in flight and recovery success. Points will not be deducted for launching, flight, or recovery failures described. This includes any damage that may be shown on the rocket.
7. Complete factory assembled rockets will not be accepted.
8. **Judging** is based upon display appearance, rocket appearance, workmanship, design or capabilities for flight, number of times launched, and report. **Three launches** are required to earn the maximum launch points given on the score sheets. For scoring, only actual launches count, misfires will not count towards one of the required three launches.
  - a. For self-designed rockets only, please include a digital recorded copy of one flight. In the documentation, please include a description of stability testing before the rocket was flown.
  - b. **The skill level of a project is not determined by number of years in project. Skill level is determined by the level listed on the manufacturing packaging.**
  - c. 4-H Rocket project levels are not intended to correspond to National Association of Rocketry model rocket difficulty ratings or levels.
9. High power rockets (HPR) are similar to model rocketry with differences that include the propulsion power and weight increase of the model. They use motors in ranges over "G" power and/or weigh more than laws and regulations allow for unrestricted model rockets. These rockets are **NOT** appropriate for 4-H projects and will be disqualified.
10. Posters can be any size up to 28 inches by 22 inches when ready for display. Example: tri fold poster boards are not 28 inches by 22 inches when fully open for display.

**All static exhibits must have received a purple ribbon at the county fair to advance to the State Fair. Entry level rockets, made with PLASTIC FINS and PLASTIC BODY TUBES, are COUNTY ONLY projects.**

**Entries per Individual** - One entry per exhibitor per class. Limit of 4 entries per exhibitor per project.

Premier 4-H Science Award is available in this area. Please see General Information for more details.

Scoresheets and other resources can be found at <https://go.unl.edu/ne4haerospace>.

## **AEROSPACE/ROCKETS Classes**

### **County Only Classes (\*\*Denotes NOT State Fair Eligible) (Scoresheet CF92)**

PREMIUMS: Purple, \$4.00; Blue, \$3.00; Red, \$2.00; and White, \$1.00

Directions can be found in the Aerospace Manuals.

- \*\*H850901 **Kite** - Kite must be homemade, no purchased kits.
- \*\*H850902 **Model Airplane or Glider**
- \*\*H850903 **Rocket** - Any skill level rocket with plastic fins
- \*\*H850904 **Rocket** - Any skill level rocket with wooden fins and plastic body tubes

H850001 **Rocket (Scoresheet SF92)**  
Any Skill Level Rocket with **wooden fins and cardboard body tubes** painted by hand or air brush.

H850002 **Aerospace Display (Scoresheet SF93)**  
Poster or Display Board that displays or exemplifies one of the principles learned in the Lift Off project. Examples include: display of rocket parts and purpose, explaining the parts of a NASA rocket or shuttle, interview of someone in the aerospace field, or kite terminology. Include notebook containing terminology (definition), and what was learned. Display can be any size up to 28 inches by 22 inches.

H850003 **Rocket (Scoresheet SF92)**  
Any Skill Level Rocket with **wooden fins and cardboard body tubes** painted using commercial application (example commercial spray paint).

PREMIUMS: Purple, \$5.00; Blue, \$4.00; Red, \$3.00; and White, \$2.00

H850004 **Self-Designed Rocket (Scoresheet SF92)**  
Any Self-Designed Rocket with **wooden fins and cardboard body tubes**.

## **DRONES**

PREMIUMS: Purple, \$4.00; Blue, \$3.00; Red, \$2.00; and White, \$1.00

H850005 **Drone Poster (Scoresheet SF93)**  
Exhibit must be designed to educate yourself and others on one or more of the following topics: drone technologies, use of drones, the different types of drones, types of training needed to operate drones, and the laws and regulations users must follow. Posters can be any size up to 28 inches by 22 inches.

H850006 **Drone Video (Scoresheet SF93)**  
Exhibit must demonstrate how the drone interacts with the outside world. Examples include: field scouting, surveying damage from natural disasters, drones used in commercial applications and settings, drones used for structural engineering. Video should not exceed 5 minutes. Videos should 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. See the State Fairbook for qualifying videos deadlines.

## **STEM COMPUTERS**

This category gives 4-H'ers a chance to display their knowledge of computers. Through participation in this category 4-H'ers will develop presentations that show judges their knowledge in the different aspects of computer science. Involvement in STEM Computers gives participants a first-hand experience in modern technology.

### **RULES:**

1. The name and county of each exhibitor should appear separately on the back of each board, poster,