SCIENCE, ENGINEERING & TECHNOLOGY
STEM (ENGINEERING)

Unlimited entries per class number may be made per exhibitor.

Premium Code: STATIC ITEMS

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 exhibit may be identified if the entry tag is separated from the exhibit.
2. Several classes require a display board which should be a height of 24" and not to exceed 1/4" in thickness. A height of 23 7/8" is acceptable to allow for the saw kerf (width) if two 24" boards are cut from one end of a 4' X 8' sheet of plywood. Nothing should be mounted within 3/4" of the top or bottom of the board. (Example: Woodworking, & Electricity). Posters can be any size up to 28" by 22" when ready for display. Example: tri fold poster boards are not 28" by 22" when fully open for display.
3. Fabricated boards such as plywood, composition board, or particle-type lumber may be used for demonstration displays.
4 Demonstration boards should be sanded and finished to improve their appearance. The finish on a demonstration board will be judged as a woodworking exhibit.
5. Demonstration boards should include an overall title for the display, plus other necessary labeling.
6. 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.

ROCKETS/DRONES

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

Learn about how to: Fly kites and launch rockets; Explore space; Experience disorientation; Learn to fly an airplane; Make a shuttle on a string; Control flight directions; Create an altitude tracker; Evaluate navigation systems; Explore pilot certification requirements.

Rules:

Youth entered in Level 1 are not eligible to advance to State Fair.

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. Rockets must be supported substantially to protect the rocket from breakage. Rockets are to be mounted on a base that has dimensions equal to or less than 12" x 12" and the base should be 3/4" thick. No metal bases. If the rocket fins extend beyond the edges of the required base (12" x 12"), 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 rockets engine mount to give added stability.
4. Rockets must be equipped as prepared for launching, with wadding and parachutes or other recovery systems. Rockets entered with live engines, wrong base size or sideboards will be disqualified.
5. A report, protected in a 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, 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 describing launching, flight, or recovery failures. This includes any damage that may be shown on the rocket. Complete factory assembled rockets will not be accepted at the State Fair.
7. 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 for the State Fair, only actual launches count, misfires will not count towards one of the required three launches.
    - 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.
    - The skill level of a project is not determined by the number of years in project. Skill level is determined by the level listed on the manufacturing packaging.
    - 4-H Rocket project levels are not intended to correspond to National Association of Rocketry model rocket difficulty ratings or levels.
8. **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.

9. Posters can be any size up to 28" by 22" when ready for display. Example: tri-fold poster boards are not 28" by 22" when fully open for display.

Aerospace/Rockets
Dept H Division 850
Classes

1 **Rocket-** Scoresheet SF92- Any Skill Level Rocket **with wooden fins and cardboard body tubes** painted by hand or air brush.
2 **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" x 22."
3 **Rocket Painted Commercially-** Scoresheet SF92- Any Skill Level Rocket **with wooden fins and cardboard body tubes** painted using commercial application. Example commercial spray paint.

Drones- Youth enrolled in STEM Rockets may exhibit in any class within this division.

Dept H Division 850
Classes

5 **Drone Poster-** Scoresheet SF93- Exhibit must be designed to educate yourself and others on one or more of the following topics: drone technologies, uses of drones, the different types of drones, types of training needed to operate drones, and the laws and regulations users must follow. Poster can be any size up to 28" by 22".
6 **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. For state fair: Qualified videos should be submitted prior to other state fair entries. Check the State fairbook for details.