

DEPARTMENT – BUILDING EXHIBITS

SECTION –AEROSPACE / ROCKETRY (Must be enrolled in Aerospace / Rocketry)

SECTION - 4-H AEROSPACE / ROCKETRY

The Kansas 4-H Aerospace / Rocketry program is designed to allow 4-H members to explore aerospace through rockets of various sizes. Kansas 4-H has adopted the National Association of Rocketry's rules, regulations, and safety guidelines.

1. If a rocket qualified for the Kansas State Fair, exhibitors should read the State Fair rules Rules for the Rocketry division as they may be different from those at the county fair. Be sure to check class numbers, they may be different.
2. Each exhibitor may enter up to two rocket exhibits that have been constructed during the current year. If two rockets are entered, one rocket must be a "model rocket kit", the second may be entered into any other applicable class. An exhibitor may not enter two rockets in the same class.
3. 4-Her4-H members are to complete and sign the rocketry information form, available from <http://rocketry.engtech4ks.com/> or your local extension office and attach it to a 10" x 13" "manila" envelope. The envelope should contain:
 - a. Instructions on how to construct the rocket.
 - b. Up to 5 pages of pictures, pictures are to be attached to sheets of paper, from both construction and launch
 - c. Documentation of any flight damage that occurred
 - d. Any modifications made to the rocket except for paint scheme and decals.
 - e. An additional page for altitude calculations if the space on the form is not enough.
 - f. Additionally, for original design rockets, also known as "scratch built" rockets:
 - i. 5 additional pages of photos are allowed
 - ii. Documentation of how the rocket was tested for stability
4. If a safety violation is noted by the judges, superintendent, or other staff, the exhibitor's rocket, at the judges' discretion, will receive a participation ribbon.
5. Rockets are to be displayed upright on a display stand with a sturdy rod that does not extend past the top of the rocket, or stand unassisted, unless the rocket is taller than 4 feet in which case no display stand is required and the rocket may be displayed on its side, rockets are not to be displayed on launch pads to save space and prevent someone from being poked in the eye.
6. Rockets ARE NOT to be displayed with used or unused rocket engines either in the rocket or as part of the stand, if rocket engines are included in the exhibit the judge may disqualify the exhibit.
7. Rockets should be flown unless there is an active burn ban in the county or conditions are too dangerous to safely launch the rocket. Just flying the last stage (the part with the nose cone) of a multi-stage rocket is acceptable.
8. Rockets, except those in the JR division, are not to be "beginner kits" or use prefabricated (molded plastic) fin assemblies, or pre-finished rockets requiring no painting, these. These are not only acceptable outside in the JR division at the county fair., and Rockets of this type outside the JR division should be disqualified. Rockets entered in the JR division may not go on to the Kansas State Fair.
9. Angles of fins must fall within a plus or minus 2-degree variation using an approved fin alignment guide (such as KSSTAC10). An official fin guide is available from <http://rocketry.engtech4ks.com/>
10. Fins and body tubes, except those in the introductory division, are to be filled and sealed with putty, sanding sealer, and/or primer or other suitable filler to eliminate the appearance of body grooves and wood grain.
11. Fins and launch lugs are to be filleted to reduce drag and properly secure them to the model.
12. Engine mounts are to be securely attached to the body tube.
13. Any seams on plastic parts are to be sanded smooth.
14. The recovery system (typically a parachute or streamer) should be attached according to the instructions
15. The nose cone is to fit snugly but still allow for easy removal.

16. Exhibits must be uniformly painted and smoothly finished without “runs,” “orange peel,” or “alligator skin” or finished as per rocket instructions (for example, no painting required), and decals, if used, are applied smoothly.
17. Models may not be judged based on their paint scheme (colors and placement on the rocket), except for rockets that fit the definition of a ‘scale model’ and are entered in the scale model class. All other rockets do not have to follow the suggested paint scheme, allowing the 4-H’er to display maximum creativity in the finishing of their rocket. Under no circumstances is the weight given to the paint scheme to be sufficient enough, by itself, to move the non-scale model from one ribbon placing to another.
18. “Scale Models” entered in the scale model class may be judged based on their paint scheme. The judge may deduct up to one ribbon placing for not following the paint scheme.
19. “Scale Models” displayed in the scale model class are to be finished and completed with a majority (greater than 70%) of decals. For all other rockets the use of decals is optional.
20. Original design rockets cannot be a modification of a pre-existing kit and must be of original design.
21. Original design rockets must be designed by the exhibitor(s).
22. Exhibitor(s) must be 11 years of age (4-H age) or older to enter an original design rocket.
23. Original design rockets must include detailed instructions, so that someone could construct the original designed rocket just like a kit purchased at a store. Instructions can be as many pages as needed to convey full and complete construction techniques.
24. For a rocket entered in the original design classes, describe in the summary how the rocket was tested for stability prior to flying. Swing testing of the rocket is required. Other tests and calculations are strongly encouraged. Exhibitors must include documentation of the swing test. Failure to swing test a rocket will result in a deduction of TWO ribbon placings.
25. Rockets that use more than one ‘D’ engine or equivalent are considered mid or high-power rockets in 4-H.
26. Mid and High-Power exhibitors must be at least 14 years of age by January 1 of the current year.
27. In addition to the information packet completed for all rockets, a high-power information form is to be completed and placed inside of the information packet. This may be downloaded from <http://rocketry.engtech4ks.com/>
28. Exhibitors in the mid and high-power divisions must hold memberships in either NAR or Tripoli organizations.
29. The NAR High Power Rocket Safety Code applies to the construction and launching of all rockets displayed in this division. As such all mid and high-power rocketry exhibitors must comply with the NAR High Power Rocket Safety Code that is in effect as of October 1st of the current 4-H year.
30. All rockets in the mid and high-power divisions are to be launched under adult supervision by the 4-H member who constructed the rocket.
31. For rockets launched using an engine(s) that have 160.1 (‘H’ engine or equivalent amount of smaller engines) Newton’s-seconds or larger, adult supervision must be provided by an individual having at least a level 1 high power certification. The 4-H member should also hold or be attempting to attain their level 1 high power certification if launching on this large of an engine.

As defined by the National Association of Rocketry (NAR), a scale model is “any model rocket that is a true scale model of an existing or historical guided missile, rocket vehicle, or space vehicle, that has flown under rocket power.” The intent of scale modeling is, according to the NAR, “is to produce an accurate, flying replica of a real rocket powered vehicle that is judged for craftsmanship in construction, finish, and flight performance.” (NAR “Model Rocket Sporting Code” 52.1 <https://www.nar.org/contest-flying/competition-guide/>)

CLASSES – 5520: Rocket made from kit, 9-13 years old

Include plans.

5521: Rocket designed by exhibitor, 11-13 years old (9-10 year olds may NOT enter in this class) Not merely a modification of an existing kit. Include original plans.

5525: Rocket made from kit ,14 years and older

Include plans.

5526: Rocket designed by exhibitor, 14 years and older

Not merely a modification of an existing kit. Include original plans.

5530: Rocket designed by 2 or more exhibitors, 11 years and older

Not merely a modification of an existing kit. Include original plans. This class is designed to encourage teamwork among individuals and clubs to work on a rocket from the initial design to the finished product.

5536: Mid-Power Rocket Made from Kit, or original design. Exhibitors 14 years and older

5535: High power rocket made from kit or original design, 14 years and older

Rocket made from kit (7-8 years old)

(Not a State Fair Class)

Prefabricated fins and pre-finished rockets requiring no painting are acceptable in this class only. Include plans.

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

Purpose: To allow 4-Hers to explore Engineering and Technology 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 <http://rocketry.engtech4ks.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' wide x 4' high x 2' deep 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).

Rocketry - Novice – Ages 7-8

- 5735 Rocketry Educational Display
- 5739 Rocketry Educational Notebook
- 5740 Rocketry Educational Poster

Rocketry Division F – Exhibitors 9 through 13 years old

- 5741 Rocketry Educational Display
- 5742 Rocketry Notebook
- 5743 Rocketry Poster Board

Rocketry Division G – Exhibitors 14 years and older

- 5746 Rocketry Educational Display
- 5747 Rocketry Notebook
- 5748 Rocketry Poster Board