STEAM ROCKETRY

Special Awards: Linda & John Funk, sponsor an award for Top Rocket Display/Exhibit. Spielman Fertilizer, sponsor $25 additional premium money for Rocketry.

STEAM-Rocketry rules:

1. Must be currently enrolled in the Rocketry program to exhibit.
2. All rockets displayed in this division must be constructed during the current year.
3. If a rocket qualified for the Kansas State Fair, exhibitors should read the State Fair rules for the Rocketry division as they may be different from those at the county fair.

4. 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” or the second may be entered into any other applicable class. An exhibitor may not enter two rockets in the same class.

5. 4-Hers are to complete and sign the rocketry information form, available from www.STEM4KS.com or the Extension Office, and attach it to a 10”X13” “manila” envelope. The envelope should contain: A) Construction Instructions B) Up to 5 pages of pictures (construction & launch) C) Documentation of any flight damage D) Any modifications made to the rocket E) An additional page for altitude calculations if the space on the form is not enough. F) Additionally for original design rockets (scratch built) Up to 5 additional pages of photos + Documentation of how the rocket was tested for stability.

6. If a safety violation is noted by the judges, superintendent, or extension staff, the exhibitor’s rocket, at the judges’ discretion, will receive a participation ribbon.

7. 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 for safety.

8. Rockets ARE NOT to be displayed with used or unused rocket engines either in the rocket or as part of the stand. May disqualify exhibit.

9. 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.

10. All rockets, except those in the JR division, are to be “beginner kits” or use prefabricated fin assemblies or pre-finished rockets requiring no painting, these are not acceptable outside the Jr division.

11. Angles of fins must fall within a plus or minus 2 degree variance using an approved fin alignment guide (such as KSSTAC10). An official fin guide is available from www.STEM4KS.com.

12. Fins and body tubes, except those in the except those in the introductory division, are to be filled and sealed with sanding sealer and/or primer or other suitable filler to eliminate the appearance of body grooves and wood grain.

13. Fins and launch lugs are to be filleted to reduce drag and properly secure them to the model.

14. Engine mounts are to be securely attached to the body tube.

15. Any seams on plastic parts are to be sanded smooth.

16. The recovery system (typically a parachute or streamer) should be attached according to the instructions.

17. The nose cone is to fit snugly but still allow for easy removal.

18. Rocket must be uniformly painted and smoothly finished or finished as per rocket instructions (for example, no painting required), and have decals, if used, are applied smoothly.

19. Models may not be judged based on their paint scheme (colors and placement on the rocket), with the exception of 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 youth 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 model from one ribbon placing to another.

20. 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 pant scheme. Rockets 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 are optional.

21. Original design rockets cannot be a modification of a pre-existing kit and must be of original design.

22. Original design rockets must be designed by the exhibitor.

23. Exhibitors must be 11 years of age (4-H age) or older to enter an original design rocket.

24. Original design rockets must include detailed instructions, so that someone could construct the original designed rocket just like a purchased kit. No page limit to convey full and complete construction techniques.

25. For 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 encouraged. Exhibitors must include documentation of the swing test.

26. Failure to swing test a rocket will result in a deduction of TWO ribbon placings.

27. A minimum of one additional page must be added to the rocketry information pack detailing the test(s) performed to insure stability. 4-Hers are strongly encouraged to provide as much detail as possible. Failure to provide adequate written documentation will result in a disqualification.

28. Rockets that use more than one ‘D’ engine or equivalent are consider mid or high power rockets.

29. Mid and High Power exhibitors must be at least 14 years of age by January 1 of the current year.

30. 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 www.STEM4KS.com.

31. Exhibitors in the mid and high power divisions must hold memberships in either NAR or Tripoli organizations.

32. 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.

33. 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.

34. 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 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.” The intent of scale modeling is, according to the NAR, “to produce an accurate flying replica of a real rocket vehicle that exhibits maximum craftsmanship in construction, finish, and flight performance.” (NAR “Pink Book” 50.1 4-1)
All Ages

H-530 – Rocketry Poster
H-531 – Rocketry Notebook
H-532 – Rocketry Project Educational Display

Beginner -Exhibitors 7 and 8 years old

H-533 – Rocket made from kit, without pre-assembled fin units. Include plans.
H-534 – Rocket made from “beginners kit.” Include plans. Rockets in this class may have pre-assembled fin units. (This class is for first and second year 4-H members to explore the rocketry project.)
H-535 – Scale Model Rocket made from kit. Include plans.

Junior -Exhibitors 9 through 13 years old

H-536 – Rocket made from kit. Include plans.
H-537 – Scale Model Rocket made from kit. Include plans.

Exhibitors 11 through 13 years old (9-10 year olds may not enter classes below.)

H-538 – Rocket designed by exhibitor: not merely a modification of an existing kit. Include original plans.
H-539 – Scale Model Rocket designed by exhibitor: not merely a modification of an existing kit. Include original plans and stability testing.

Senior -Exhibitors 14 years and older

H-540 – Rocket made from kit. Include plans.
H-541 – Rocket designed by exhibitor: not merely a modification of an existing kit. Include original plans.
H-542 – Scale Model Rocket made from kit. Include plans.
H-543 – Scale Model Rocket designed by exhibitor; not merely a modification of an existing kit. Include original plans and stability testing.

Team -Exhibitors 11 years and older

This class is designed to encourage teamwork among individuals and clubs to work on a rocket from the initial design to the finished product.

H-544 – Rocket designed by 2 or more exhibitors: not merely a modification of an existing kit. Include original plans.

Team-Exhibitors 14 years and older

H-545 – Mid or high power rocket made from kit or original design
STEAM ASTRONOMY

STEAM-Astronomy rules:
1. Youth must be currently enrolled in the project to exhibit.
2. Each exhibitor may enter one exhibit per class. Exhibit must have been completed during the current year.
3. Telescopes entered in this division may be built from a kit or by original design. Pre-finished telescopes, which require no construction or painting are not acceptable exhibits.
4. Telescopes are limited to no more than six feet in length.
5. Each exhibit must include a “4-H Astronomy Exhibit Information Form,” which should be attached to the outside of a 10” x 13” manila envelope.
6. For complete listing of rules, check with Extension Agents.

H-501-Telescope made from kit
H-502-Telescope made from original design
H-503-Poster
H-504-Notebook
H-505-Project Educational Display

STEAM COMPUTER SYSTEMS

STEAM-Computer Systems rules:
1. The computer project teaches concepts related to computers, hardware knowledge, software programming and applications, internet safety, the building, maintenance and repair of computers and future career opportunities. Please note that the actual construction of computer hardware (i.e., building a computer, electronic devices with a mother-board based manipulation) will remain in the Energy Management division.
2. Youth must be currently enrolled in the project to exhibit in this division.
3. Each exhibitor may enter one exhibit per class. Exhibit must have been completed during the current 4-H year.
4. For a complete set of project exhibit rules, contact Atchison County Extension Office.

H-511-Single computer system (web server, database server, etc.)
H-512-Networked system consisting of two or more computers
H-513-Chip system - a small (8”X8”X8”) programmed physical device that accomplishes a specific task
H-514-Poster
H-515-Notebook
H-516-Project Educational Display

STEAM ROBOTICS

STEAM-Robotics rules:
1. Youth must be currently enrolled in the Robotics project to exhibit.
2. Each exhibitor may enter one robot per class. Exhibit must have been constructed and/or completed during the current 4-H year.
3. 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.
4. 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 system division or energy management project. Robots requiring no assembly, just programming, such as Ozobots, are considered computer system projects as the skill is focused on the programming not on the construction of the robot.
5. For a complete set of project rules, contact the Extension Office.

H-521-Robot made from a commercial (purchased) kit. (No Programming just assembly)
H-522-Robot designed by exhibitor. The robot must not be a mere modification of an existing robot kit or plan.
H-523-Programmable robot made from a commercial (purchased) kit.
H-524-Robot designed and constructed by exhibitor or from a commercial kit, that is operated by a remote controlled device.
H-525-Junk Drawer Robotics
H-526-Team Robotics (2 or more youth-Check with Extension Office for guidelines.)
H-527-Poster
H-528-Notebook
H-529-Project Educational Display

STEAM-Unmanned Aerial Systems

STEAM-Unmanned Aerial System rules:
Purpose: The 4-H unmanned aerial system (UAS) project explores the world from above the trees and discovers new frontiers with UASs. UASs are commonly known as Unmanned Aerial Vehicles (UAVs) or drones. Members explore the uses and applications of unmanned aerial system including how UASs link to other projects such as geology, robotics, electronics, crop science and many more.
1. Youth must be currently enrolled in the project to exhibit. 2. Each exhibitor may enter one exhibit per class. Exhibit must have been completed during the current 4-H year.

3. The required information that accompanies the UAS must be limited to the 4-H SPACETECH STEM Exhibit Information Form which is affixed to a 10” x 13” envelope. This may be downloaded from www.STEM4KS.com or by contacting the extension office. Any UAS exhibit not including this completed envelope will receive an automatic participation ribbon.

4. Each exhibit must include a video of the youth operating their UAS to allow judge to get a better understanding of the exhibit and allows the youth the opportunity to fully demonstrate their exhibit.

5. Exhibitors in this section, should consult with the Extension Office for complete rules and information.

H-601-Unmanned Aerial System From Kit  May exhibit a UAS that is purchased off the shelf. (First 2 years in project only. Not State Fair eligible.)

H-602-Unmanned Aerial System Remote Operated Device Designed and constructed by exhibitor. Not be a mere modification of an existing kit or plan.

H-603-Practical application of an Unmanned Aerial System constructed from a commercial (purchased) kit. This includes the UAS, plus one or more of the following: video, notebook, poster, display board, etc. This class is separate from educational exhibits. A tangible use would be mapping, eroded soils, bindweed in fields, and many other non-agricultural UAS uses.

H-604-Poster

H-605-Notebook

H-606-Project Educational Display