Division Y

4-H SPACE TECH-ASTRONOMY
4-H SPACE TECH GENERAL RULES
Astronomy & Robotics

Judging: Refer to schedule for check-in and judging times.

1. The 4-H member must be currently enrolled in the 4-H Space Tech project to exhibit in this division.
2. Each exhibitor may enter one exhibit per class. Exhibit must have been completed during the current 4-H year and have been selected at the county level for entry at the State Fair level.

Astronomy

1. 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.
2. Telescopes are limited to no more than four feet in length. They must be placed on a stand that does not allow the telescope to roll and /or fall over. The stand cannot extend past two feet in length or width.
3. Each State Fair telescope exhibit must include a "4-H Astronomy Exhibit Information Form" which should be attached onto the outside of a 10"x13" manila envelope. You must also include construction plans (or a photocopy) of the telescope and place it inside the manila envelope. For notebooks, display boards and posters, no additional exhibit information is required; no manila envelope is needed for these exhibits.
4. Two photographs showing telescope construction and operation are required. Photographs should be mounted on one side of an 8-1/2 x 11 page. A brief caption should accompany each photograph. Place photos in the 10"x13" manila envelope.
5. The telescope must be properly assembled and painted with a smooth and uniform finish. Decals, ifs used, should be attached smooth and tight.
6. Telescopes designed by the exhibitor must be original, not a modification of an existing kit.
7. Educational displays should be creative and showcase something specific the 4-H member has learned in the Astronomy project during the current 4-H year. Follow copy right laws, as explained in the General Rules. Sources of scientific information must be cited on the front of your exhibit, including all posters and educations display boards.

8. Educational displays are not to exceed a standard commercial 3'x 4' tri-fold display board. Other odd sized-type displays (non-tri-fold) shall not exceed 30"x36". Care should be taken to use durable materials that will withstand State fair conditions.
9. Exhibitor's name, county or district, age and year(s) in project must be tagged or labeled in a prominent location on the telescope stand, educational display, notebook, and/or poster.
10. Astronomy educational posters must be not larger than a standard sized poser board, generally 20"x30".
11. Astronomy project notebooks must be organized in a 3 ring binder.

Class 610- Telescope made from kit
Class 611- Telescope made from original design
Class 612-Astronomy Educational Display
Class 613-Astronomy Educational Notebook
Class 614-Astronomy Educational Poster

4-H SPACETECH-COMPUTERS

See General Rules

1. The 4-H 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 devises with a mother-board based manipulation) will remain in the Energy Management division.
2. The 4-H members must be currently enrolled in the 4-H SpaceTech 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 and have been selected at the county level for entry at the State Fair level. Counties or district should select only top blue or purple ribbon computer exhibits which meet State Fair guidelines.
4. Educational display boards, posters and notebooks should be creative and showcase details about the knowledge learned in the computer project. Value is placed on youth who can demonstrate how their skills have increased while completing the project.
5. 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.kansasSpaceTech.com
6. Follow copyright laws, as explained in the General Rules as you are preparing your exhibit(s). Sources of scientific information must be citied on the front of your exhibit, including all posters and educational display boards.

7. For notebooks, display boards, and posters, no additional exhibit information is required; no manila envelope is needed for these exhibits as in some phases of SpaceTech.
8. Computer exhibits may be checked out for use in a Kansas State Fair 4-demonstration or 4-H illustrated talk with prior permission. For permission, check with the superintendent. The exhibit must be returned to display immediately after the demonstration/illustrated talk or the exhibit will be disqualified.
9. Educational posters must be no larger than 20"x30" poster board.
10. Educational displays are not to exceed a standard commercial 3'x4' tri-fold display board. Commercially available "Science Fair presentation Boards" are encouraged. Exhibitors are encouraged to laminate all posters and maps or cover them with clear plastic film. Any three display dimensional display exhibits may not be thicker than 1".
11. Project notebooks must be organized in a 3-ring binder.
12. Exhibitor's name, county or district, age, and year(s) in project must be tagged or labeled in a prominent location on the exhibit, education display, notebook, and/or poster.
13. If the notebook illustrates the creation, talks about, or shows the result of an app, application, executable, program, or other compiled/interpreted "source code," a copy of the source code should be included. (In other words if you created an app for a smart phone and you're illustrating that app, you should include the code you used to build the app). Failure to include a copy of the "source code" may result in up to one ribbon place deduction.

Class 614A—Computer Educational Poster

Class 614C—Computer Notebook

Computer Systems The Kansas 4-H SpaceTech Computer Systems portion of the computer project is designed to allow 4-H members to explore how information is moved from one part of the computer to the other; how information is moved between two or more computer systems (networking); how information is stored; or how information is acted on (programming).

Any item which is not a notebook, display board, or poster displayed in this class is considered a "computer system" exhibit and MUST follow the rules set forth below.

1. All exhibits must be self-contained on a USB drive (thumb drive, flash drive, jump drive, or any other name for a small USB storage device; the rules will use "USB drive"). This means that a judge can plug in the USB drive into a computer and be able to run the exhibit as described below.
2. All revisions of all forms previously released for the SpaceTech division either undated or dated prior to 2017 are void for use and new forms must be obtained and

used that are dated by the Kansas State 4-H Office for the current year. Use of old forms will result in the loss of one ribbon placing for exhibits.

3. For all computer system entries (those entries not covered by the rules above) the following items are required as part of an exhibit packet:
   a. A manila envelope with the Computer Exhibit Form attached to the front, this form can be downloaded at www.KansasSpaceTech.com.
   b. A USB drive labeled with the 4-Hers name, county/district, and club; in a way that does not prevent it from being plugged into a computer.
   c. At least one (1) graphic (picture, screen shoUcapture, slide, etc.) of the project must be printed out on an 8.5" X11" sheet of standard computer paper, placed in a plastic sheet protector, to allow for proper display and recognition at the Kansas State Fair. On the back side of the graphic the 4-Her's name, county/district, and club should be listed.
   d. Instruction to run any part of the exhibit on the USB drive. There should be a least three 3 items in our manila envelope; USB drive ra hic and instructions.
4. Each exhibit must be accompanied by a "4-H Engineer's Journal." The engineer's journal should be typed. It can either be included electronically on the USB drive (preferred) or printed and placed in the manila envelope.
   a. The "4-H Engineer's Journal" should start with a dated entry describing what the 4-H member is trying to accomplish/build.
   b. The "4-H Engineer's Journal" should conclude with a dated entry describing what the 4-H member achieved in creating. (The start and end many times will be different. The judges are interested in the journey).
   c. Additional entries in the "4-H Engineer's Journal" should be made as progress occur describing successes and failures; as well as the steps done and any sources of information including links used.
   d. Pictures can also be included in the "4-H Engineer's Journal" but should not be more than 50% of the entries.
   e. The "4-H Engineer's Journal" should contain at least one graphic.
   f. The "4-H Engineer's Journal" must be at least 3 pages in length.
   g. An example of a "4-H Engineer's Journal" can be found at www.KansasSpaceTech.com
   h. The "4-H Engineer's Journal" will comprise 50% of the overall exhibit score. Failure to include a "4-H Engineer's Journal" will result in the exhibit being disqualified.
5. If the exhibit is a program, application, app, web site, or requires any coding, the source code must be included on the USB drive.

6. Diagrams or decision trees showing the logical flow of the system must be included on the USB drive for all exhibits.
7. Since there is no conference judging at the Kansas state Fair, a set of instructions must be provided to run the computer system/application. These instructions should be printed off and included in the exhibit package and a copy should be included on the USB drive.
    a. FOR COUNTY FAIRS it is recommended that 4-Hers bring a computer that will run their project to the fair for judging as judging as judges typically do not bring computers with them. Operating instructions are still required.
    b. Instructions should be written as though you were helping a less tech person, (like a grandparent) use the USB drive with a computer similar to what is described in rule 9 below. An example of instructions can be found at www.KansasSpaceTech.com.
8. Each exhibit must accomplish a specific automated task using a computer or virtual machine (VM).
9. Kansas State Fair Judge(s) in the computer systems division will have a physical computer with the following minimum configuration:
    a. Microsoft windows ® 7-64bit
    b. Microsoft Office ® Home 2010 (Excel, Power Point, & Word)
    c. Microsoft Internet Explorer®
    d. Mozilla Firefox® Brower
    e. Google Chrome® Browser
    f. Java for Windows
    g. G Adobe Acrobat Reader®
    h. Apache Open Officer®
    i. VMware player 7.0.0 Windows 64bit
10. 4-Hers should not assume that the computers in rule 9 have Internet connectivity and that any parts of the exhibit that require Internet access will not work. It is strongly recommended that the 40Hers test exhibits on a computer with Internet connectivity disabled.
11. Kansas 4-H SpaceTech has made available Linux Virtual Machines (VMS) that can be downloaded and used to create projects on such as web servers, networking, and many others projects. For more information on how the VMs can be leveraged or to download them visit www.KansasSpaceTech.com. 4-Hers are not required to use the VMs in their projects. They are optional
12. All licensing should be adhered to for any software used in the exhibit. **Failure to do so will result in a reduction of one ribbon placing and may not be considered for best of show.**

13. The creation of viruses, malware, malicious applications or code, defamatory language or graphics, bullying, or any material that is "mean," "dangerous," or harmful according to the judge's opinion will result in the exhibit being disqualified.
14. Pictures or still graphics created are not eligible for entry as a project in this division, and should be entered in the appropriate photography division.
15. Judging will be based on a score sheet which can be found at www.KansasSpaceTech.com. There are four (4) areas each exhibit will be judged on. They are:
    a. 4-H Engineers Journal (what I learned to make it work), 50% overall score
    b. Instructions (how I help others make it work), 25% overall score
    c. Functionality (does it work), 12% overall score

Division B- Computer Systems

Class 614D. Computer program, application, app, script, or coded system that is new and unique (not merely a file run in a program, such as a 'word document' or a picture drawn in 'Microsoft Paint.')

Class 614E—Computer presentation (power point, web page/site, animated graphics, etc.)

Class 614F - Single computer system (web server, database server, etc.)

Class 614G - Networked system consisting of two or more computers

4-H SPACETECH-GPS/GIS

See General Rules

1. Educational display boards, posters and notebooks should be creative and showcase something specific you have learned in the GPS/GIS project during the current year. Follow copy-right laws as explained in the General rules as you are preparing your exhibit(s), Sources of scientific information must be cited on the front of the exhibit, including all posters and educational display boards.
2. Educational posters must be no larger than 22"x28" poster board.
3. Educational displays are not to exceed a standard commercial 3'x4' tri-fold display board. Commercially available Science Fair Presentation Boards ® are encouraged. Exhibitors are encouraged to laminate all posters and maps or cover them with clear plastic film.
4. Project notebooks must be organized in a 3-ring binder.

5. Exhibitor's name, county or district, age and year(s) in project must be tagged or labeled in a prominent location on the exhibit, education display, notebook and /or poster.
6. Team exhibits are defined as developed by two or more 4_H members.
7. Each State Fair GPS/GIS exhibit must include a GPS/GIS "Exhibit Information Form", which should be attached to the outside of a 10"x13" manila envelope. All supporting materials must fit in the manila envelope. For notebooks, display boards and posters, not additional exhibit information is required; no manila envelope is needed for these exhibits.
8. Photographs complementing the project are required. Photographs should be mounted on one side of an 8 ½"x11" page. A brief caption should accompany each photograph. Place photo page in manila envelope.
9. Geocache boxes should show growth from year-to-year, and not just be the same exhibit from the previous year(s).

   Class 615—Geocache Box must include geocache box contents, description, photograph and map of location in which the box could be located. Failure to include photograph and/or map will results in a lowering of the ribbon placing.

   Check www.geocaching.com for instructions on place and description.

   GPS/GIS Map: One map constitutes an entry. Map can be either informational or directional, A map is a single product of data gathering, manipulation and presentation skills. Multiple related maps should be entered under GPS/GIS Community Mapping Projects. Value is placed on youth that can model the learning process, or show how their skills have increased while completing the map. Only one inset map within a larger over-all map is allowed. Maps must have relevant cartographic elements as part of the map.

   Class 616—GPS/GIS Map –Individual

   Class 617—GPS/GIS-Team

   GPS/GIS community Mapping Project. Two or more maps on a related project constitute an entry.

   Maps can be either informational or directional. Complete and attach a Map Project Description Sheet with entry. Community Mapping Projects consist of a detailed goal and multiple applications of either GPS or GIS skills. A conclusion is reached, a problem was evaluated or studied, a solution was found (or the problem was better defined). Value is placed on youth that can model the learning process, or show how their skills have increased while completing the project. Maps must have relevant cartographic elements as part of the map.

   Class 618—GPS/GIS Community Mapping Projects-Individual

   Class 619—GPS/GIS Community Mapping Projects-Team

   Class 620—GPS/GIS Educational Poster

Class 621—GPS/GIS Display Board

Class 622—GPS/GIS Notebook

May include, but not limited to, explanation of the parts of GIS map, illustration of how GPS works, information on "Youth Favorite Places", etc.

Class 623—Team Mapping Educational Display

Display should show and explain the project in detail including printouts of maps, pictures of the project being done, who was collaborated with, and how the project results have and will be utilized. Exhibit must be labeled on the back with the following information for all participating members, name, club, county/district, age as of January 1, and date display

Class 624—Geography Educational Poster

Class 625—Geography Display Board

Class 626—Geography Notebook

Exhibit should include what was learned and knowledge gained about geography. Value is placed on youth that can model the learning process, or show how their skills have increased while completing the projects.

4-H SPACE TECH ROBOTICS

See General Rules

1. Each Robot must be free standing, without the need for additional supports in order to be moved or exhibited.
2. Robot dimensions should not exceed 2 ft. high x 2 ft. wide x 2 ft. deep. Weight may not exceed 15 pounds.
3. 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
4. Robots may be powered by an electrical, battery, water or solar only. 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.
5. Remove 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.
6. Each robot must be in operable working condition. The judges will operate each robot to evaluate its workmanship and its ability to complete the required tasks for this current 4-H year.
7. Each exhibitor is required to complete the '4-H Space Tech Robotics Exhibit Information Form' which is available through your local extension Office. This for must be attached

to the outside of a 10”x13” manila envelope. For notebooks, display boards and posters, no additional exhibit information is required; no manila envelope is needed for these exhibits.

8. The exhibit must include written instructions for operation construction plans, one to three pages of project photographs or a 5 minute CD, DVD or video presentation, and robot programming information, if applicable. This information should be placed in the 10”x13” manila envelope mentioned above. The exhibitor may enter their electronic project listed under the electric program as under the electric program as under the Space Tech robot project if the exhibitor so chooses.
9. Creativity, workmanship and functionality will be strong criteria in judging the ‘Robot designed by Exhibitor’ classes.
10. Exhibitor’s name and county or district must be tagged or labeled in a prominent location on the robot, educational display, notebook and/or poster board. Sources of scientific information must be cited on the front of exhibits, including all posters and educational display boards.
11. Educational displays are not to exceed a standard commercial 3’x4’ tri-fold display board. No card board table exhibits will be allowed. Care should be taken to use durable materials that will withstand State Fair conditions. No electricity will be provided.
12. Educational posters must be no large than 20”x30”.
13. Team project notebooks must be organized in a 3-ring binder and should highlight information/roles of each team member, drawings, charts, photographs, goals and objectives of your robotic project, and all robotic competitions your team has competed in during the current 4-H year.
14. There are no county or district boundaries that must be adhered to in order to form a Kansas 4-H Space Tech Robotics team. However, as mentioned under General Rules #1, each team member must be currently enrolled in the Kansas 4-H Space Tech project.

Division A

Novice Robotics

One to Two years in Project

Class 627—Robot made from a commercial (purchased) kit.

Class 628—Robot designed and constructed by exhibitor. The robot must not be a mere modification of an existing robot kit or plan.

Class 629—Programmable robot made from a commercial (purchased) kit.

Class 629A—Robot designed and constructed by exhibitor, that is operated by a remote-controlled device.

Class 629B—Junk drawer robotics-based curriculum robot.

Class 630—Robotics educational display.
Class 631- Robotics educational notebook.
Class 632—Robotics educational poster.

Division B

Intermediate Robotics

Three to Four Years in Project

Class 633—Robot made from a commercial (purchased) kit.
Class 634—Robot designed by exhibitor. The robot must not be a mere modification of an existing robot kit or plan.
Class 635—Programmable robot made from a commercial (purchased kit).
Class 635A—Robot designed and constructed by exhibitor, that is operated by a remote-controlled device.
Class 635B—Junk drawer robotics-based curriculum robot.
Class 636—Robotics Educational Display.
Class 637—Robotics Notebook.
Class 638—Robotics Educational Poster.

Division C

Professional Robotics

Five or More Years in Project

Class 639—Robot made from a commercial (purchased) kit.
Class 640 –Robot designed by exhibitor. The robot must not be a mere modification of an existing robot kit or plan.
Class 641—Programmable robot made from a commercial (purchased kit).
Class 641A—Robot designed and constructed by exhibitor, that is operated by a remote-controlled device.
Class 641B—Junk drawer robotics-based curriculum robot.
Class 642—Robotics educational display.
Class 643—Robotics educational notebook.
Class 644—Robotics educational poster.

Division D

Team Robotics Project

Class 645—Robot designed and constructed by 2 or more 4-H Space Tech project members which is eligible for the Team Robotics Challenge, if entered. The robot must not be a mere modification of an existing robot kit or plan. This division is designed to

encourage teamwork and cooperation among fellow 4-H Space Tech members. As with many high tech projects today, no one person designs and builds alone. It takes the brainstorming, planning, problem solving and cooperation of an entire team to complete a given robotics project. Exhibitors in this division will be assigned a task for their robots to perform. The tasks are changed annually. Please visit the Space Tech Web site www.Kansaspacetech.com for the current year's task. Click on the KSF Packet Link.

Class 646—Team Robotics Educational Display
Class 647—Team Robotics Educational Notebook
Class 658—Team Robotics Educational Poster

Division E

Team Robotics Challenge at the 2017 Kansas State Fair

The Robotics Challenge is a separate class number and activity for general robotics. The Team Robotics Challenge will be from 4-6 p.m. on the first Saturday of the fair in 4-H Centennial Hall, Kansas State Fairgrounds, Hutchinson, KS. Team robotics teams will randomly draw for the starting order and will be allowed three attempts in rotation to navigate the specified course. Programming corrections may be made between attempts. Practice will be from 4-5 p.m. and the Challenge will begin at 5 p.m. or after the completion of 4-H judging at the west end of 4-H Centennial Hall. For more information, click on Team Robotics Challenge and the Robotics Task Rules on the right panel: www.KansasSpaceTech. Com. Team Robotics Challenge details and rules will be posted by July1, 2017.

Call 648A—Team Robotics Challenge

4-H Space Tech-Rocketry

The Kansas Space Tech 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 rules regulations and safety guidelines.

Exhibit information for All rocketry categories:

1. All revisions of all forms previously released for the Space Tech division either undated or dated prior to 2017 are void for use and new forms must be obtained and used that are dated by the State 4-H Office for the current year. Old forms will result in the loss of one ribbon placing for exhibits
2. Relevant documents may be obtained from County Extension Offices or from www.KansasSpaceTech. Com
3. NAR refers to National Association of Rocketry and its Governing board.

4. All NAR documents, with the exception of the "pink book" reference herein can be found at http://www.nar.org
5. If a burn ban is in effect for any county in Kansas, exhibitors in any Kansas county are not required to launch their rocket(s). All requirements for the launching of rockets for the state fair and the documenting of the launching are suspended for the duration of the ban.

Exhibit definitions for ALL rocketry categories.

1. As defined by the NAR, a scale model is "any model rocket that is a true scale 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 50.14-1).
2. Adult supervision is defined as being under the direct supervision of someone 18 years or older.
3. For the purposes of Kansas 4-H Space Tech, a high powered rocket is defined as a rocket that meets any one the following criteria:
   a. Is 2 inches or greater in diameter (not including fins) and taller than 3 feet (36 inches including fins);
   b. Weights more than 3.3125 pounds (53 ounces or 1500 grams) at the time of launch;
   c. Uses an 'E' engine or larger to launch (2 D's, 4 C's 8 B's, etc.)
   d. The total impulse of all engines used in the rocket is greater than 20.01 Newton-seconds of thrust.
   e. Models powered by rocket motors not classified as model rocket motors per NFPA 1122, e.g;

   i. Average thrust in excess of 80.01 Newton's.

   j. Contains in excess of 2.2 ounces (62.5 grams) of propellant and are limited to only H and I motors.

4. High power certification is defined as having successfully completed a certification program for high-powered rocketry through the NAR and maintaining that certification. This applies to all membership levels in the NAR, specifically the "Formal Participation Procedure" for the" junior HPR Level 1 Participation Program" as outlined by the NAR.

5. NAR rules for launching and construction of all rockets are assumed to be used by all 4-H Space Tech exhibitors and will be considered during judging.

6. For the purpose of Kansas 4-H Space tech, NO rocket may be launched using engines totaling more than an 'I' impulse engine or 640 Newton-seconds of total thrust.

Exhibit Rules for ALL rocketry categories:

Purpose: These rules apply to how rockets are to be displayed at the fair and what those displays should and should not contain. These rules apply to all rockets displayed in the Space Tech division.

1. 4-H members must be currently enrolled in the 4-H Space Tech-Rocketry program to exhibit in this division.
2. Entries must have been selected at the county level for entry at the State Fair.
3. 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 either a "kit" or a "rocketry education exhibit" and the may be entered into any other applicable class. An exhibitor may not enter two rockets in the same class.
4. The report that accompanies the rocket must be limited to the 4-H Space Tech Rocket Exhibit Information Form which is affixed to a 10"x13" envelope. This envelope should NOT be attached to the rocket stand or rocket. This may be downloaded from http:www.Kansas4-H.org/. Any rocket exhibit not including this completed envelope will receive an automatic participation ribbon.
5. Plans (or a photocopy) must be placed inside the envelope.
    a. This includes original design rockets.
    b. If a rocket kit has been modified structurally, notations need to be given indicating the changes made, either by notations on the Rocket Exhibit Information Form or by placing notes in the plans.
6. One or more photographs of rocket at the launch site are required.
    a. Photographs showing the rocket at the moment of ignition are preferred.
    b. Photographs must be mounted on one side of 8 ½"x11"page(s).
    c. There must be at least one page of photos and no more than 5 pages of photos.
    d. Include at least one photo showing rocket construction, preferable with the exhibit included.
    e. Do not include photos of members catching their rockets as the return to earth. This is an unsafe practice, and we do not recommend or condone this practice.
7. To exhibit in this division:
    a. The rocket must have flown.
    b. Support rods must not extend past the tip of the highest nosecone on the model.

c. Support rods must remain in the upright position, 90 degrees to the display base, do not angle. If support rods are not perpendicular to the base, the judge should deduct two ribbon placings.
d. No model may be submitted on a launch pad.

8. Launches should not be conducted in winds above 20 mph, and will constitute a disqualification of rocket exhibit.
9. All rockets must have a safe method of recover, e.g., parachute, streamer or tumble recovery. Any rocket without a recovery system will be disqualified.
10. The altitude achieved by the rocket is to be determined using a method other than estimation. Examples of accepted methods include altimeter, computer software, range finders, etc. If additional space is needed to show calculations of how the altitude was achieved, one additional page may be added to the rocketry information pack.
11. Flight damage is to be documented by the participant on either the construction plans or the 4-H Space Tech Rocket Exhibit Information Form.
12. The judging of flight damage is to be secondary to all other aspects of the model and only then may it even be considered. However under no circumstance may flight damage be grounds for disqualification.
13. Engines and ignites, under any circumstance ARE NOT permitted with the exhibit and constitutes an immediate disqualification.
14. If an engine becomes stuck, jammed, wedged, or in any other way permanently affixed in or to a rocket and cannot be removed from the rocket**,** the rocket will be subject to immediate disqualification. This is because it is not possible to make a full and immediate assessment of the safety of the rocket when it is being judged and safety is paramount.
15. Engines may not be used as display stands hollowed out or otherwise. This is a significant change from previous year's rules. Engines used as a display stand will be subject to immediate disqualification.
16. Rocket engines should not be used to join multi-stage rockets together.
    a. Multi-stage rockets can be displayed without having the stages connected together.
    b. The different stages must be included to complete the rocketry exhibit. Incomplete exhibits will be deducted at least one ribbon placing.
    c. Use of any engines to join the stages together will be subject to immediate disqualification.
17. Multi-stage rockets can be flown using just the final stage and be considered fully flown.
18. 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. All information necessary will be given to the NAR and TRIPOLI for investigation and possible revocation of membership.

Construction Rules for All rocketry categories:

Purpose: These rules apply to the construction of all rockets displayed in the Space Tech division.

1. Rockets are to be properly assembled according to the assembly instructions.
2. Beginner kits with prefabricated fin assemblies and pre-finished rockets requiring no painting are not acceptable, and will be disqualified.
3. Plastic snap together fins and prefabricated fin assemblies that do not require fin alignment are not acceptable and will be disqualified.
    a. This rule does not apply to plastic fins that must be manually aligned and do not utilize a fin alignment mechanism, including, but not limited to fin alignment rings or spacing blocks.
    b. This rule does not apply to fiberglass, Kevlar, extruded foam, composite or wood fins; especially when used for "through the wall" fin attachment techniques that are common in larger rockets.
    c. In addition, plastic parts for decorative and mechanical purposes (Le. Decorative nozzles and moving landing struts) are not considered fins and can consist of plastic. Decorative nozzles, etc. need to be securely fastened and not pose a safety hazard.
4. 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 www.Kansas SpaceTech.com.
5. Fins should be rounded or streamlined to reduce drag.
6. Fins and body tubes are to be sealed with sanding sealer and/or primer to eliminate the appearance of body grooves and wood grain.
7. Fins and launch lugs are to be filleted to reduce drag and properly Secure them to the model.
8. Any seams on plastic parts are to be sanded smooth.
9. Body tubes/air frames/engine mounts can be made from suitable materials, including, but not limited to: reinforced paper, cardboard, phenolic resin, specialized polymer resins, fiberglass, Kevlar, or other suitable structural materials.
10. The nose cone is to fit snugly but allow for easy removal.
11. Exhibits must be uniformly painted and smoothly finished or finished as per rocket instructions, and have decals applied smoothly.
12. Nonstandard surfacing (such as textured paint) may be used if directed by the instructions, this includes scratch built rockets.
13. 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". All

other rockets do not have to follow the suggested paint scheme, allowing the 4-Her to display maximum creativity in the finishing of their rocket.

a. 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.

14. "Scale models" may be judged based on their paint scheme. The judge may deduct up to one ribbon placing for not following the paint scheme.
15. Scale Model Rockets are to be finished and completed with a majority (greater than 70%) of decals.

Model Rocketry Guidelines

(ages 9 years and up)

Purpose: Model rockets are generally small-to-medium sized rockets that can be purchased at hobby stores or are small-to-medium sized model rockets that an individual(s) builds from parts similar to those found in model rocket kits.

1. Rockets classified as high powered may not be entered in this category.
2. Each rocket must be able to stand freely by itself or is supported by a solid base, not to exceed 4-1/4' (four and one-quarter inch) thick and 8" square. The exhibitor's name, county or district, and age must be labeled on the top of the base.
3. If the model rocket is greater than 4 feet tall it can be displayed without a base, or displayed parallel to the ground with up to 3 notched blocks not to exceed 4" in height, width and depth. The exhibitor's name, county or district and age must be labeled on the top of the base.
4. All exhibitors must comply with the NAR Model Rocket Safety Code that is in effect as of October 1st of the current 4-H year. However, in the event that there is a modification in this code, the Space Tech Action Team may review and implement the modified code.

Original Design Rocket Guidelines

(ages 11 years and up)

Purpose: To allow for youth to develop their own rockets (model and high power) in a safe manner that displays maximum craftsmanship.

1. Original design rockets cannot be a modification of a pre-existing kit and must be of original design.
2. Original design rockets must be designed by the exhibitor(s)
3. 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.

4. Original design rocket instructions should not include copies of instructions in part or in whole from existing kits.
5. For a rocket entered in the original classes, describe in the summary how the rocket was tested for stability prior to flying.
6. Up to four additional pages can be added to the rocketry information pack detailing the test(s) performed to insure stability. 4-Her's are strongly encouraged to provide as much detail as possible. Failure to provide adequate written documentation will result in a disqualification.

Alternative Skins
(ages 14 years and up)

Purpose: Alternative skins are an advanced construction technique that allows the builders of model rockets to display maximum design and creativity in their models. Alternative skins are thin coverings over a supporting skeleton that serve as the finish of a rocket as opposed to painting.

Construction and operating Rules and Guidelines.

1. The General exhibit rules for ALL categories apply.
2. Use of alternative skins used for model aircraft is permitted on rockets of original design provided adequate provisions are made to prevent the rocket from catching fire during all phases of flight.
3. When used in construction these alternative skins should not be used as primary structure for the rocket. The rocket should still be of sound design and construction to insure safety for personnel performing launch activities as well as others who are in the nearby vicinity.

Types of Covering:

1. Plastic shrink type coatings used for radio control model aircraft are permitted. These can be obtained from various manufacturers and hobby suppliers.
2. Other types of fabric coverings such as cloth types using coatings for stiffness are permitted as long as all of the rules set forth above are met.

Quality of Finish:

When the above finishes are used the following judging criteria will apply in addition to those for judging other rocketry divisions.

1. Seams and transition areas will be uniform and even when they are needed in the construction.
2. Gaps and holes are not permitted in the covering especially where the fins or other stabilizing devices meet the main body of the rocket.
3. Omission of these skins from the bottom of the rocket is permissible. Paints and other types of coatings currently used for rocketry may be substituted in these areas.
4. Alternative skins in this section may also be used in conjunction with paints on the rocket. However, care shall be taken to ensure that edges of the alternative skin will not peel off in flight.

Division A

(ages 9 through 13 years)

Class 649—Rocket from a kit

Class 650—Rocket designed by exhibitor; not a modification of an existing kit. Include original plans.

Division B

(ages 11 through 13 years)

Class 651—Rocket designed by exhibitor, not a modification of an existing kit. Include original plans.

Division C

(ages 14 years of age and older)

Class 652—Rocket made from a kit Include original plan

Class 653—Rocket designed by exhibitor; not a modification of an existing kit. Include original plans.

Class 654—Rocket designed by exhibitor that uses alternative skins; Not a modification of an existing kit. Include original plans.

Division D

(11 years of age 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.

Class 655—Rocket designed by 2 or more exhibitors, not a modification of an existing kit. Include original plans.

High Power Rocketry Guidelines:

Purpose: To allow for improved safety and judging of rockets that meet the requirements of 4-H high power rockets.

1. Exhibitors must be at least 14 years of age by January 1 of current year.
2. The rules of ALL categories apply.
3. 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://www.Kansas 4-H.org/. Click on KSF packet link.
4. The NAR High Power Rocket Safety Code applies to the construction and launching of all rockets display in this division.
   As such, exhibitors must comply with the NAR code that is in effect as of October 1st of the current year. However, the event that there is a modification in this code, the Space Tech Action Team may review and implement the modified code.
5. All rockets in this division are to be launched under adult supervision by the 4-H member who constructed the rocket.
6. If a rocket is launched using an engine(s) that has 160.1 ('H' engine or equivalent amount of smaller engines) Newton-seconds or larger, adult supervision must be provided by an individual having at least a lever 1 high power certification.
   a. The 4-H member should also hold or be attempting to attain Level 1 high power certification, and should include supporting documentation of (a copy of Level 1 card is sufficient).

7. If according to Federal Aviation Regulations Part 101, a waiver is required to fly the rocket, a copy of that waiver is to be attached to the High Power Information Form. In the case where the launch was a public event a substitute to a copy of the waiver is the Range Safety Officers (RSO's) contact information.
8. High Power Rockets may be displayed without a supporting stand. If a supporting stand is used, it is not to exceed 4-1/4" (four and one-quarter inch) thick and 8" square.
   The exhibitor's name, county or district and age must be labeled on the base.

Division E
(ages 14 years and older)

Class 656—High power rocket made from kit or original design.

Rocketry Educational Exhibits—Posters, Notebooks and Display Boards.

1. The rules for ALL categories apply.
2. Entries must have been selected at the count level for entry to the Kansas State Fair.
3. Exhibits may not consist of only a rocket, but must contain substantial supporting educational material in the form of posters, notebooks or display boards. Etc.
4. Displays should be creative and showcase something specific you have learned in the Rocketry project during the current 4-H year.
5. Follow copyright laws, citing all sources of information in a standard notation on the "4-H Educational Rocketry Exhibit Information Form." Additional pages can be added inside the information pack and should be labeled "Citations".
   Site your sources of scientific information on your exhibit, when appropriate.
6. Educational displays are not to exceed a standard commercial 3'x4' tri-fold display board. No card board table exhibits will be allowed. Care should be taken to use durable materials that will withstand Fair conditions.
7. "Construction Kits" that are part of Education displays must be contained in cases (tackle boxes, sealable container, etc.) that may not be larger than 1'x2'x2' 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. Rocketry Educational Project notebooks must be organized in a 3-ring binder.
9. Educational Posters must be not larger than a 22"x28" poster board.
10. Engines and ignites ARE NOT permitted with the exhibit and constitute 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 educational display, notebook, "Construction Kit" and/or poster.
12. Exhibits should possess the following qualities (in no particular order).
    a. A Central theme.
    b. What you want others to learn
    c. Be designed and constructed in a manner befitting the exhibit.
    d. Be something you are interested in.
    e. Be related to model or high power rocketry.
    f. And those characteristics described above.

Division F

(ages 9 through 13 years)

Class 657—Rocketry Educational Display

Class 658—Rocketry Notebook

Class 659—Rocketry Poster Board

Division G

(ages 14 years and older)

Class 660—Rocketry Educational Display

Class 661—Rocketry Notebook

Class 662—Rocketry Poster Board