

# **Northeast Kansas Judging Day**

**Monday July 6, 2020**

## **Rules & Class Numbers**

For: Entomology, Geology, Forestry, Wildlife, & Space Tech

# Fair Entry Form

Due to Extension Office by **June 15, 2020.**

Name \_\_\_\_\_ Co/Dist \_\_\_\_\_

Club Name: \_\_\_\_\_

## **FORESTRY, ENTOMOLOGY, GEOLOGY, WILDLIFE**

Class Number	Class		Class Number	Class

## **Space Tec- Includes Rockets, GPS, Robotics and Computers**

Class Number	Class		Class Number	Class

**\*\*\* Judging will be held in Horton, KS on Monday, July 6<sup>th</sup> from 3-9 pm at the Horton Community Building (Blue Building).**

## 4-H ENTOMOLOGY

A 4-H member enrolled in the Entomology Project may exhibit in the ENTOMOLOGY COLLECTION, ENTOMOLOGY NOTEBOOK and/or EDUCATIONAL DISPLAY categories. Within each category, there are classes in Beginning, Intermediate or Advanced phases in which they enroll. The Notebook category also has an Introductory class that 4-Hers may exhibit in the State Fair as long as they meet age requirements and County Fair ribbon placing requirements. An Introductory Entomology Collection Class exhibit is encouraged for county fairs (first year members only), but these may not be exhibited at the State fair. See class descriptions within categories for requirements. Resources for exhibiting can be found on the Kansas 4-H Entomology project page [COLLECTION CLASSES](#)

1. All entries should be submitted in an 18 x 24 x 3.5 inch wooden display box with a clear plastic top (such as Plexiglas). Boxes can be handmade or purchased as long as they are of the correct size. Please visit the website listed above for box instructions and plans.
2. 4-Hers may choose to use one of two taxonomies: Option A: As printed in "Insects in Kansas" book, or Option B: As printed on the "Insects in Kansas Book: 2016 Revised Taxonomy", which follows [www.bugguide.net](http://www.bugguide.net)
3. Each exhibitor is required to identify each box with two identification labels bearing Exhibitor's name, county or district, the collection class 4-H'er is enrolled in and statement of taxonomy used. One label goes in the upper left corner of the box (inside) and the other on the lower right corner of the box (outside). Arrange specimens in the box so the box can be displayed lengthwise.
4. The number of orders, specimens (and families where required) must be included on both of the exhibitor's box identification labels. Only one adult insect per species can be used in the Collection Boxes and NoteBook Classes, unless labeled as male or female and correctly identified.
5. Arrange specimens in groups or rows parallel to the short sides of the box. Specimens are to be arranged by Order in the box, then Family where required.
6. Two labels should be centered on the pin beneath each specimen. First (closest to the specimen) is the common name label and the second label should include date/locality. Full county name and state abbreviation should be on the second label. Collector's name (or host) on the date/locality label is optional.
7. The specimens should be collected by the exhibitor and should focus on Kansas insects. Insects may be collected from one county into bordering states and labeled accordingly. Please refer to "Entomology Collection Exhibit Resource" for full details on out-of-state insects in collections.
8. Only specimens of the class Insecta should be included.
9. Purchased insects are not to be exhibited in collections, but they may be used in educational displays.
10. Specimens of soft bodied insects such as aphids, lice, termites, etc. should be exhibited in alcohol filled vials; however, the use of alcohol filled vials should be limited to only those specimens that lose their shape when pinned, since the vials pose a significant hazard to the rest of the collection if they become loose in transit.

4900 BEGINNING I ENTOMOLOGY COLLECTION Display in one standard box a minimum of 50 and maximum of 125 species representing at least 7 orders. Follow the general guidelines listed for Collections. Members can exhibit in this class a maximum of 3 years or until they receive a purple ribbon at the Kansas State Fair, whichever comes first.

4901 BEGINNING II ENTOMOLOGY COLLECTION Display in one standard box a minimum of 75 and maximum of 150 species representing at least 9 orders. Follow the general guidelines listed for Collections. Members can exhibit in this class a maximum of 3 years or until they receive a purple ribbon at the Kansas State Fair, whichever comes first.

4903 INTERMEDIATE ENTOMOLOGY COLLECTION Display a minimum of 100 and a maximum of 300 species representing at least 10 orders. Two standard boxes can be used. Follow the general guidelines listed for Collections. In addition, family identification is required for all insects in any two of the following six orders: (Only two will be counted for judging) a) "Insects in Kansas" book - Orthoptera, Hemiptera, Homoptera, Coleoptera, Hymenoptera, and/or Diptera or b) "Insects in Kansas Book: 2016 Revised Taxonomy", which follows [www.bugguide.net](http://www.bugguide.net) - Odonata, Orthoptera, Hemiptera, Coleoptera, Hymenoptera, and/or Diptera On a piece of paper list what you did to improve your collection during the current year. Members can exhibit in this class a maximum of 3 years. A 4-H'er may move up if they receive a purple ribbon.

4905 ADVANCED ENTOMOLOGY COLLECTION Display a minimum of 150 and a maximum of 450 species representing at least 12 orders. Three standard boxes can be used. Follow the general guidelines listed for Collections. Family identification is required for all insects belonging to the six basic orders as outlined under the Intermediate phase. Only families in the above six orders will be counted for judging. Family identification of insects in the remaining orders is optional, but desirable as long as accuracy is maintained. On a piece of paper list what you did to improve your collection during the current year. Examples: what insects did you add or replace; what orders and/or families you added; what Leadership you provided in this project; and/or what insects you have studied. Attach paper to the back of one of the display boxes. Members may continue to exhibit in this class at the Kansas State Fair for an unrestricted number of years as long as they remain eligible for 4-H membership.

#### NOTEBOOK CLASSES

1. Individual entries are to be placed for display in a three-ring notebook for competition.
2. 4-Hers may choose to use one of two taxonomies: Option A: As printed in "Insects in Kansas" book or Option B: As printed on the "Insects in Kansas Book: 2016 Revised Taxonomy", which follows [www.bugguide.net](http://www.bugguide.net)
3. 4-Hers who have been previously enrolled in or are currently enrolled in the other phases of the Entomology project need to start with the Beginning Phase of Entomology Notebooks, not the introductory phase.
4. Each exhibitor is required to identify the notebook by placing a Title Page in the front of the notebook bearing the exhibitors name, county or district and class 4-H'er is enrolled in and statement of taxonomy used: Option A: "Insects in Kansas" book or Option B: "Insects in Kansas Book: 2016 Revised Taxonomy," which follows [www.bugguide.net](http://www.bugguide.net) The number of orders, specimens and families (required in Intermediate and Advanced classes) must also be included on the Title Page.

5. Specimen pages should be grouped according to order and should include one page per species. If more than one insect is in the photo, an arrow to indicate identified insect should be used.
6. Date, common name, full county name and state abbreviation should be included for each species. Collector's name on the specimen page is optional.
7. Specimen pages should have two different views of the insect if possible. If pictures are taken on different dates/localities, include information for both.
8. A statement describing the habitat where found/host plant may be included and is encouraged and will be worth a bonus 10 points total, not per page. For Intermediate and Advanced notebooks, this is strongly encouraged.
9. A divider page is to be placed in front of each order of insects with the order name printed on the tab for the page as well on the front of the divider page.
10. For the Intermediate and Advanced classes, insects are also to be grouped by family behind each order divider.
11. If the exhibitor has been in the same class for more than one year, a separate sheet of paper needs to be added stating how many years the exhibitor has been in this class of the project and what the exhibitor did this year to improve their notebook. Place the paper just behind the Title Page in the front of the notebook.
12. A special project must be completed each year and included in the notebook. See project guideline materials for specifications.
13. Refer to the publication "Entomology Collection Notebook Guidelines" on the Kansas 4-H Entomology web page for more detailed rules for exhibiting.

4907 INTRODUCTORY ENTOMOLOGY NOTEBOOK Display a minimum of 10 and a maximum of 30 insect species representing at least 6 different orders. Follow the general guidelines listed for Notebooks, including the Special project. A 4-H member must be of minimum age to compete at the Kansas State Fair. A 4-H member may exhibit in this class for a maximum of two years.

4908 BEGINNING ENTOMOLOGY NOTEBOOK Display a minimum of 20 and a maximum of 60 insect species representing at least 7 different orders. Follow the general guidelines listed for all Notebooks, including the Special project. Members can exhibit in this class a maximum of 3 years or until they receive a purple ribbon at the Kansas State Fair, whichever comes first.

4909 INTERMEDIATE ENTOMOLOGY NOTEBOOK Display a minimum of 60 and a maximum of 100 species representing at least 9 orders. Follow the general guidelines listed for Notebooks, including the Special project. In addition, family identification is required for all insects in any two of the following six orders: (Only two will be counted for judging)

a. "Insects in Kansas" book - Orthoptera, Hemiptera, Homoptera, Coleoptera, Hymenoptera, and/or Diptera or

b. "Insects in Kansas Book: 2016 Revised Taxonomy" which follows [www.bugguide.net](http://www.bugguide.net) - Odonata, Orthoptera, Hemiptera, Coleoptera, Hymenoptera, and/or Diptera Members can exhibit in this class a maximum of 3 years. A 4-H'er may move up if they receive a purple ribbon.

#### 4910 ADVANCED ENTOMOLOGY NOTEBOOK 15

Display a minimum of 100 and a maximum of 200 species representing at least 12 orders. Follow the general rules listed for Notebooks, including the Special project. Follow the general guidelines listed for Notebooks. Family identification is required for all insects belonging to the six basic orders as outlined under the Intermediate phase. Only families in the above six orders will be counted for judging. Family identification of insects in the remaining orders is optional, but desirable as long as accuracy is maintained. Members may continue to exhibit in this class for an unrestricted number of years as long as they remain eligible for 4-H membership.

#### EDUCATIONAL DISPLAYS

1. Share with others what you learned in this project. Exhibit any activity or learning experience related to the field of entomology or the Teaming with Insects curriculum that does not fit into Entomology Collection or notebook classes above.
2. Follow copyright laws as explained in the General Rules.
3. The exhibit may be, but isn't limited to, original works, digital presentations (must provide printed hardcopy for exhibit purposes for duration of state fair), programs, websites, games, apps, display box, notebook, display or poster which you have made.
4. If the exhibit is a wooden display box, it must be 18 X24 X 3.5 inches with a clear plastic top (such as plexiglass) and displayed horizontally. If the exhibit is a poster, it must not be larger than 22" X 28". If the exhibit is a display, maximum size is not to exceed a standard commercial 3' X 4' tri-fold display board.
5. Name and county/ district must clearly be marked on educational exhibits.

4902 BEGINNING EDUCATIONAL EXHIBIT Class for individuals that are exhibiting in the Beginning I and II Collection or Beginning Notebook Classes. If only exhibiting in this category, then ages 9-12.

4904 INTERMEDIATE EDUCATIONAL EXHIBIT Class for individuals that are exhibiting in the Intermediate Collection or Intermediate Notebook Classes. If only exhibiting in this category, then ages 11-14.

4906 ADVANCED EDUCATIONAL EXHIBIT Class for individuals that are exhibiting in the Advanced Collection or Advanced Notebook Classes. If only exhibiting in this category, then ages 13 or older.

#### **4-H GEOLOGY and LAPIDARY**

1. The exhibit box should be 18" x 24" x 3½". Plexiglas covers are required. Boxes with glass covers WILL NOT be accepted. All specimens are to be arranged across the narrow (18") dimension of the exhibit box, making the exhibit 18" across the top and 24" deep exactly. If a box has a sliding Plexiglas cover, it must be removable from the top. Screws, locks, or other devices that would prevent judges from

removing the cover should not be used. For Lapidary classes 5300-5304 only, the dimensions of the box should be appropriate for the display, but should not exceed 18"x24"x31/2".

2. Each exhibitor is required to identify each display box by placing an identification label bearing name, county or district, and number of specimens in the upper left hand corner of the Plexiglas cover (inside-use clear double sided tape to adhere gummed labels), and by attaching a label with the same information on the lower right corner of the box (outside).

3. Exhibitor may enter in both geology and lapidary classes. Exhibitor may show in only one of the first four geology classes (5200, 5201, 5202 or 5203). Exhibitor may also show in geology class 5204 (special exhibit), 5205 Mineralogy, 5206 Fossils, and in one lapidary class.

4. Geology specimens should be labeled with the number of the specimen, date collected, specimen name or description, and locality (county only) where collected.

5. For the geology classes 5200, 5201, 5202 and 5203, specimens should be mounted in the box by proper groups: rocks, minerals, fossils. Fossils must be identified to the Phylum, Class and Genus level. Genus name is to begin with a capital letter. Species name is all lower case. Genus and species names must either be italicized or underlined, not both. The words "phylum, class, genus" on labels are to be spelled out, not abbreviated. More than one specimen of the same kind of rock or mineral or species of a fossil may be exhibited if this duplication represents different geological formations. Specimen label must show this distinction (Fort Hays limestone, not just limestone; calcite from the Greenhorn Formation, not just calcite; Phylum: Brachiopoda Class: Articulata Genus: Composita from the Morrill Limestone Member, not just Phylum: Brachiopoda Class: Articulata Genus: Composita).

6. For geology classes 5200, 5201, 5202, 5203, 5305, and 5206 all specimens must be collected by the participant (not purchased) from locations in Kansas, with the exception of Tri-State Mining Area specimens collected from these three adjacent counties: Ottawa County, OK; Newton and Jasper Counties, MO. Other out of state specimens will not count in the minimum number for the class, nor will they be considered in the judging.

7. Exhibitors may have a consultation review of their work by visiting with a member of the judging committee. Someone will be available from 3:00 to 6:00 pm on the first Friday of the fair in the Geology exhibit area.

5200 Geology. Display at least 15 rocks, minerals, and fossils collected during the current 4-H year. Exhibitor is limited to one exhibit box. Only those exhibiting at State Fair for the first time may enter this class.

5201 Geology. Display at least 30 different rocks, minerals, or fossils, at least 5 of each. Fifteen must be collected during the current 4-H year. Exhibitor is limited to one exhibit box. This class is open to those exhibiting either first or second time at State Fair.

5202 Geology. Display at least 45 rocks, minerals, or fossils, at least 5 of each. Fifteen must be collected during the current 4-H year. Exhibit limited to two boxes. This class is open to those exhibiting either the third or fourth time at the State Fair. Identify the rocks as igneous, metamorphic or sedimentary. These rock types must be spelled out on labels or have a legible key.

5203 Geology. Display at least 60 rocks, minerals, or fossils, at least 5 of each. Fifteen must be collected during the current 4-H year. Exhibit limited to two boxes. This class is open to those exhibiting the fifth time or more at the State Fair. Identify the rocks as igneous, metamorphic or sedimentary. These rock types must be spelled out on labels or have a legible key.

5204 Geology Educational Exhibit: Exhibit relating to everyday living; or to a mineral test, a rock formation, geological history, species of a fossil, forms of one mineral, a variation of one kind of rock, archaeological artifacts, or Indian artifacts. Digital formats are accepted. Please make arrangements for the judge to view your exhibit and have a hard copy for display. Exhibit limited to 4 feet of table space. Care should be taken to use durable materials that will withstand State Fair conditions. Exhibitor may show in the class regardless of number of times he or she has exhibited at State Fair or whether exhibitor has entries in classes 5200, 5201, 5202 or 5203. Exhibitor may also exhibit in lapidary class.

5205 Mineralogy. Display a minimum of 15 mineral specimens collected in Kansas, at least 5 of which have been collected during the current 4-H year. The minerals are to be grouped by mineral class (ie: Carbonates, Oxides, Silicates) and at least 3 classes must be represented. The member must use one standard display box (see #1). The specimens must be labeled with the number of the specimen, date collected, name of specimen, county where collected and chemical composition (ie: CaCO<sub>3</sub> for calcite) if known.

5206 Fossils. Display a minimum of 15 fossil specimens collected by the participant in Kansas, at least 5 of which have been collected during the current 4-H year. The fossils are to be grouped by Phylum and Class, and at least 3 phyla must be represented (Brachiopoda, Chordata, Mollusca, etc.) The member must use one standard display box (see #1). The specimens must be labeled with the number of the specimen; date collected; county where collected; formation, member, or source; phylum, class, and genus or part; and geologic age (Cretaceous, Permian, Pennsylvanian, etc.) See #5 for additional fossil labeling expectations.

LAPIDARY CLASSES The lapidary will be judged on the following criteria: Workmanship and Content..... 60 points Presentation and Showmanship..... 30 points Accuracy of Information..... 10 points

All lapidary specimens should be labeled with the following information: - Specimen name - Place of origin (country, state, or county; county required for Kansas specimens) - Purchased or self-collected - Date lapidary treatment began - Date lapidary treatment completed (Treatment completed after the State Fair is considered a new year specimen).

5300 Lapidary. Display at least 5 varieties of polished (tumbled) specimens and 5 varieties of unpolished specimens that have not yet received lapidary treatment. These do not have to be an example of “before and after”, nor do they have to be self-collected. Locales must be identified. Only those exhibiting lapidary at the State Fair for the first time may exhibit in this class..

5301 Lapidary. Display before-and-after examples of at least 3 varieties of specimens, at least 2 tumble-polished and 2 unpolished of each. There is no requirement that the 4-H'er collect any of these. Locales must be identified. Lapidary work should be done during the current 4-H year.

5302 Lapidary. Display before-and-after examples of at least 6 varieties of specimens, at least 2 tumble-polished and 2 unpolished of each. At least two varieties should be collected from the native site by the 4-H'er, at least one of which comes from Kansas. Locales must be identified. Lapidary work on at least three varieties should be done during the current 4-H year.

5303 Lapidary. Display before-and-after examples of at least 9 varieties of specimens, at least 2 tumble-polished and 2 unpolished of each. At least three varieties should be collected from the native site by the 4-H'er, at least two of which comes from Kansas. Locales must be identified. Lapidary work on at least three varieties should be done during the current 4-H year.

5304 Lapidary. Exhibit at least 6 specimens that have not previously been exhibited, which have received lapidary treatment. Lapidary treatment may consist of polishing, and end, face, or flat lapping. Specimens must represent at least 3 different varieties and include at least three cabochons of any size or shape, only one of which may be free-formed. A cabochon is a style of cutting in which the top of the stone forms a domed or curved convex surface. Three of the specimens must be mounted into jewelry findings.

Special lapidary exhibits should be entered in class 5304. Please note that each member is limited to one entry in this class.

#### **4-H FORESTRY**

1. Each member may enter up to two exhibits in 4-H Forestry but only one entry per class. Participants can exhibit in a collection phase and one other class, 5104-5109, or they may exhibit in any two non-collection classes, 5104-5109. 21
2. All leaf exhibits are to be mounted on 8½" x 11" heavy stock paper and placed in loose leaf binders. (Magnetic or adhesive filler sheets for photographic prints or sheet protectors are recommended.) Twigs and fruit collections may be exhibited in whatever manner you choose. Maximum tri fold size is 3' x 4'. Resources for exhibiting are located on the Kansas 4-H forestry project page: <https://www.kansas4-h.org/projects/agriculture-and-natural-resources/plant-sciences/forestry.html>
3. Name, club, age, and year in project should be on front cover or in a prominent location.
4. Leaves should be identified with an appropriate label located near the leaf on the same page. These labels should include (1) The proper common name as listed in the 4H334, "List of Native Kansas Forest Trees " (<https://www.bookstore.ksre.ksu.edu/pubs/4H334.pdf>); (2) Location (city and/or county) where collected; and (3) date (day, month, year) or (month, day, year) collected.
5. Divide specimens into the following two sections: Native Kansas Trees, and Non-Native Trees. (<https://www.bookstore.ksre.ksu.edu/pubs/4H334.pdf>)
6. New specimens are those specimens collected during the current 4-H year and cannot be a duplicate tree species of previously displayed specimens.
7. Group specimens according to the years collected (ex. "old-previous years" and "new").
8. Variations of varieties do not count as different species or specimens.

9. When replacing previously displayed samples, due to degradation, improper mounting or incorrect identification, the specimen label must also be updated. Replacements do not count as new specimens. Replacements should be displayed in the "old previous" section of the display.

10. If you retrieve information for your forestry exhibit, you must include a reference citation to the source.

11. In all leaf collections, exhibit one complete leaf where possible. If leaf is too large, exhibit as much as possible. Sketch in reduced scale the entire leaf and illustrate where the exhibited portion is from. Note: A "leaflet" is incorrect when displayed as the complete leaf for the tree.

12. All work must show originality. Leaf collections and displays should not closely resemble work done by others in the same club.

#### Knowing Trees as Individuals (Leaf Collections\*\*)

5100 Forestry Collection: (Choose either A or B) Only those exhibiting at the state fair for the first year may enter this class. A. Exhibit a minimum of 10 different leaves from native Kansas trees collected within the year. Exhibit can include non-native leaves in addition to the required number of leaf specimens collected from native Kansas trees. B. Exhibit a minimum of 5 native Kansas trees showing leaf, twig and fruit from each species collected.

5101 Forestry Collection: (Choose either A or B) This class is open to those exhibiting either for the first or second time at the state fair. A. Exhibit a minimum of 20 different leaves (including 10 new specimens) from native Kansas trees. Exhibit can include non-native leaves in addition to the required number of leaf specimens collected from native Kansas trees. B. Exhibit a minimum of 10 native Kansas trees showing leaf, twig and fruit from each species collected. This exhibit must include 5 new leaf, twig and fruit specimens.

5102 Forestry Collection: (Choose either A or B) This class is open to those exhibiting either for the third or fourth time at the state fair. A. Exhibit a minimum of 30 different leaves (including 10 new specimens) from native Kansas trees. Exhibit can include non-native leaves in addition to the required number of leaf specimens collected from native Kansas trees. B. Exhibit a minimum of 15 native Kansas trees showing leaf, twig, and fruit from each species collected. This exhibit must include 5 new leaf, twig and fruit specimens.

5103 Forestry Collection: (Choose either A or B) This class is open to those exhibiting the fifth time or more at the state fair. A. Exhibit a minimum of 40 different leaves (including 20 new specimens) from native Kansas trees. Exhibit can include non-native leaves in addition to the required number of leaf specimens collected from native Kansas trees. B. Exhibit a minimum of 20 native Kansas trees showing leaf, twig, and fruit from each species collected. This exhibit must include 10 new leaf, twig and fruit specimens. How A Tree Grows

5104 Notebook: Entry may include a project notebook with 10 or more seeds collected with pictures showing a germination study or a mounting of a thin section of wood cut from the end of a log or top of stump labeled with information such as kind of wood and age of tree when cut or exhibits an illustration of how a tree grows. Tree Appreciation

5105 Notebook: Entry may include a research or reporting project notebook with no more than 10 pages based on the exhibitor's selected tree. Exhibit must be a different species of tree each year. This notebook may include sketches, drawings, pictures, a story, or any other things which will help tell about the tree you have selected. Growing and Protecting Trees

5106 Display/Notebook: Entry requires a display, or project notebook, telling about project and pictures before, during, & after planting seedlings, a container tree, or a balled and burlapped tree. Maximum tri-fold size is 3' x 4'. 22 Tree Culture

5107 Display/Notebook: Entry requires a display, or project notebook, showing your project work and includes pictures of before, during and after wood lot improvement. Maximum tri-fold size is 3' x 4'. How Forests Serve Us

5108 Entry may include collected wood samples (all or partial) and 2 page essay. Wood sample display to be mounted on poster board or any stiff material no larger than a 3' x 4' tri-fold. Essay should be displayed in a covered binder. Educational/Creative Exhibit

5109 Entry must be directly related to tree identification or Forestry. Type of exhibit is open (notebook, poster, collection box, etc.) given a maximum tri-fold size of 3' x 4'. Care should be taken to use durable materials that will withstand State Fair conditions. This is a good class to exhibit an unusual collection.

### **2020 4-H SPACETECH – ASTRONOMY**

1. The 4-H member must be currently enrolled in the 4-H SPACETECH 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. Counties or districts should select only top blue or purple ribbon Astronomy exhibits which meet State Fair guidelines.
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. They must be placed on a stationary stand that does not allow the telescope to roll and/or fall over. The stand cannot extend past two feet in length or width.
5. Each State Fair telescope exhibit must include a "4-H Astronomy Exhibit Information Form," which should be attached to the outside of a 10" x 13" manila envelope. You must also include construction plans (or a photocopy) for 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.
6. See the last section for full details about exhibiting posters, display boards and notebooks.
7. Two photographs showing telescope construction and operation are required. Photographs should be mounted on one side of an 8 ½" x 11" page. A brief caption should accompany each photograph. Place photos in the 10" x 13" manila envelope.

8. The telescope must be properly assembled and painted with a smooth and uniform finish. Decals, if used, should be attached smooth and tight.
9. Telescopes designed by the exhibitor must be original, not a modification of an existing kit. Exhibitor's name, county or district, age, and year(s) in project must be tagged or labeled in a prominent location on the telescope.
10. SPACETECH Superintendent(s) will be present on the first Friday of the fair at 5:00 pm to convey judging criteria and to answer questions for exhibitors. Consultation/Interview judging is not available during judging on Friday.
11. Astronomy exhibits may be checked out for use in a Kansas State Fair 4-H demonstration or 4-H illustrated talk with prior permission. For permission, check with the chair or Anissa Jepsen. The exhibit must be returned to display immediately after the demonstration/illustrated talk or the exhibit will be disqualified
12. If a safety violation is noted by the judges, superintendent, or other staff, the exhibitor's exhibit, at the judges' discretion, will receive a participation ribbon.

5500 Telescope made from kit

5501 Telescope made from original design

#### **4-H SPACETECH – COMPUTERS**

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 devices 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. Computer exhibits may be checked out for use in a Kansas State Fair 4-H demonstration or 4-H illustrated talk with prior permission. For permission, check with the chair or Anissa Jepsen. The exhibit must be returned to display immediately after the demonstration/illustrated talk or the exhibit will be disqualified. 33
5. Exhibitor's name, county or district, 4-H age, and years(s) in project must be tagged or labeled in a prominent location on the exhibit, educational display, notebook, and/or poster.
6. See the last section for full details about exhibiting posters, display boards and notebooks.
7. SPACETECH superintendent(s) will be present on the first Friday of the State Fair at 5 p.m. to convey judging criteria and to answer questions for exhibitors. Consultation/interview judging is not available during judging on Friday.

8. If a safety violation is noted by the judges, superintendent, or other staff, the exhibitor's exhibit, at the judges' discretion, will receive a participation ribbon.

**Computer Systems** The Kansas 4-H SPACETECH Computer System 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 system (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: a. Self-contained on a USB drive (thumb drive, flash drive, jump drive, or other 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. OR b. System -On-A-Chip (SOC) (such as Raspberry Pi) or a Micro-Controller (such as an Arduino or Ozobot) AND is a compact (less than 8"X 8"X 8") system, which can be programmed AND requires minimal assembly to operate (e.g. connecting power, display, and keyboard/mouse cables). Referred to as a "chip system" through the rest of the rules.
2. Physical computers such as tablets, smart phones, laptops, or personal computers (PCs) will not be accepted as an exhibit.
3. "Chip system" may use/include GPIO bread boards or HATs (Hardware Attached On Top) the size of which is not included in the size of the chip system however the total size of the chip system and GPIO devices may not exceed 24"X24"X24" including any protective enclosures.
4. Any attached GPIO devices are not judged for electrical construction or quality as this division is focused on the operational aspects of the system that have automated articulated structures (arms, wheels, grippers, etc.) which the exhibitor constructed, can also be classified as a robot, and the exhibitor must decide which division to exhibit in as the exhibit may not be entered in the both divisions.
5. For chip system, all electric components of the system must be adequately covered or concealed with a protective enclosure. Paper is NOT considered an adequate enclosure or covering for the electrical components.
6. All revisions of all forms previously released for the SPACETECH division either undated or dated prior to current year 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.
7. For all computer system entries 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](http://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. For exhibits that are entered on USB drives, at least one (1) graphic (picture, screen shot/capture, slide, etc.) of the project must be printed out on an 8.5" X 11" sheet of standard computer

paper, placed in a plastic sheet protector, to allow for proper display and recognition at the Kansas State Fair. This is what will be displayed during the fair, all other materials will be sent back to the county/district office. On the back side of the graphic the 4-Her's name, county/district, and club should be listed.

d. Instructions to run any part of the exhibit on the USB drive. (There should be at least three (3) items in your manila envelope: USB drive, graphic and instructions).

8. 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](http://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.

9. If the exhibit is a program, application, app, web site, or requires any coding, the source code must be included on the USB drive. Failure to include a copy of the "source code" may result in up to one ribbon place deduction.

10. Diagrams or decision trees showing the logical flow of the system must be included on the USB drive for all exhibits.

11. 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 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 techy 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](http://www.KansasSPACETECH.com).

12. Each exhibit MUST include a video of the youth following their instructions for operation. This allows judges to get a better understanding of the exhibit and allows the youth the opportunity to fully demonstrate their exhibit. The video should be no longer than 8 minutes and should be placed on the USB drive. These videos may also be considered for inclusion in a running video loop in the STEM area at the state fair after review by judges, superintendent(s), and extension staff. Adult guardians must complete the video release included with the exhibit form. If the release is not completed the video will not be included in the video loop on display in the STEM area at the Kansas State Fair.

13. Each exhibit must accomplish a specific automated task using a computer, a chip system, or virtual machine (VM).

14. Kansas State Fair Judge(s) in the computer system division will have a physical computer with the following minimum configuration to test exhibits with and view files:

- a. Microsoft Windows® 10
- b. Microsoft Office® Home 2010 (Excel, Power Point, & Word)
- c. Microsoft Internet Explorer®
- d. Mozilla Firefox® Browser
- e. Google Chrome® Browser
- f. Adobe Acrobat Reader®
- g. Apache OpenOffice®
- h. VMware Player Windows 64bit
- i. Scratch Desktop editor (offline version)

15. The SPACETECH judges will have internet access at the Kansas State Fair. Internet based content may be included in exhibits. Exhibitors should take great care and only go on-line with their guardian's permission. User names and passwords should not be included in exhibits. If they are required to view the content, a temporary user account and password should be created for judging at the Kansas State Fair, once judging is complete the user name and password should be disabled on the account. If a separate user account is not possible, the content should be included as part of the video. **YOU SHOULD NOT SHARE YOUR USER NAME OR PASSWORD WITH OTHERS.**

16. 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 other projects. For more information on how these VMs can be leveraged or to download them visit [www.KansasSPACETECH.com](http://www.KansasSPACETECH.com). 4-Hers are not required to use the VMs in their projects. They are optional.

17. 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.

18. 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.

19. 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.

20. Judging will be based on a score sheet which can be found at [www.KansasSPACETECH.com](http://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

d. Diagrams (and code if applicable) (how I think it works), 13% overall score

21. SPACETECH chair(s) will be present on the first Friday of the fair, at 5 p.m. to convey judging criteria and to answer questions for exhibitors. Consultation/interview judging is not available during judging on Friday.

#### Division Computer System

5590 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.’)

5591 Computer presentation (power point, web page/site, animated graphics, etc.)

5592 Single computer system (web server, database server, etc.)

5593 Networked system consisting of two or more computers

5594 Chip system - a small (8”X8”X8”) programmed physical device that accomplishes a specific task

#### **4-H SPACETECH-ROBOTICS**

1. 4-H members must be currently enrolled in the Kansas 4-H SPACETECH project to exhibit in this division.

2. Each exhibitor may enter one robot per class. Exhibit must have been constructed and/or completed during the current 4-H year. The robot must have been selected at the county level for entry at the State Fair. Counties or districts should select only top blue or purple ribbon robot exhibits which meet State Fair guidelines. 35

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. Robot dimensions should not exceed 2 feet high, by 2 feet wide, by 2 feet deep. Weight may not exceed 15 pounds. If displayed in a case (not required or encouraged) the outside case dimensions may not be more than 26 inches in height, width, or depth.

6. Materials including but not limited to obstacles, spare batteries, and mats for testing the robot may be placed in a separate container, which is not included in the robots dimensions, that container may not be larger than 576 cubic inches as measured along the outside of the container. (Examples: 4"X4"X36" or 4"X8"X18" or 6"X6"X16) The container, if used, and/or any large objects (such as mats or obstacles) should be labeled with the exhibitors name(s) and county or district.

7. 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.

8. Robots may be powered by an electrical, battery, water, air or solar source only. Junk drawer robots may be powered by a non-traditional power source. 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.

9. Remote controlled robots are allowed under certain conditions provided that the robot is not drivable. Robotic arms (hydraulic or electric) are allowed. A remote is allowed provided more than a single action happens when a single button is pressed on the remote, for example "a motor spins for 3 seconds, at which point an actuator is triggered, then the motor spins for 3 more seconds." Remote controlled cars, boats, planes and/or action figures, etc. are not allowed.

10. Each robot must be in working condition. The judges will operate each robot to evaluate its workmanship and its ability to complete year its intended task. In the event the robot uses a phone, tablet, or similar device for programming AND control of the robot a video will be used to evaluate the working condition of the robot.

11. Each exhibitor is required to complete the "4-H SPACETECH Robotics Exhibit Information Form" which is available through your local K-State Research and Extension office. This form must be attached to the outside of a 10" x 13" manila envelope

12. The exhibit must include written instructions for operation (the instructions should be written as if they were to tell a grandparent or elderly person how to operate the robot), construction plans, and one to three pages of project photographs. In addition a 5 minute video presentation placed on a CD, DVD, USB drive, or similar removable storage device, if applicable. For robots that can be programmed, robot programming information must be included, this information should be placed inside the 10" x 13" manila envelope mentioned above. The exhibitor may enter their electronic project listed under the electric program as under the SPACETECH robotics project if the exhibitor so chooses. No exhibitor will be allowed to set up their robot in person.

13. In the event that the robot uses a device like a phone, iPad, or tablet for programming AND operation, DO NOT include the device (phone, tablet, etc.). The device's safety cannot be insured. Instead record a video demonstrating the instructions included for your robot. It should show, setting up the robot, starting the robot, the robot executing its task, and powering off the robot, just like the instructions are written.

14. Each exhibit MUST include a video of the youth following their instructions for operation. This allows judges to get a better understanding of the exhibit and allows the youth the opportunity to fully demonstrate their exhibit. The video should be no longer than 8 minutes and should be placed on the CD, DVD, USB drive, or similar. These videos may also be considered for inclusion in a running video loop in the SPACETECH area at the state fair after review by judges, superintendent(s), and extension staff. Adult guardians must complete the video release included with the exhibit form. If the release is not completed the video will not be included in the video loop on display in the SPACETECH area at the Kansas State Fair.

15. Creativity, workmanship, and functionality will be strong criteria in judging the "Robot designed by Exhibitor" classes. All robots should have a purpose or intended function, examples include, but are not limited to: following a line, sweeping the floor, solving a rubix cube, sorting colors, or climbing stairs.

16. Exhibitor's name(s) and county or district must be tagged or labeled in a prominent location on the robot,

17. There are no county or district boundaries that must be adhered to in order to form a Kansas 4-H SPACETECH Robotics team. However, as mentioned in #1, each team member must be currently enrolled in the Kansas 4-H SPACETECH project.

18. STEM SPACETECH Superintendent(s) will be present on the first Friday of the fair at 5:00 pm to convey judging criteria and to answer questions for exhibitors. Consultation/interview judging is not available during judging on Friday.

19. Robotics exhibits may be checked out for use in a Kansas State Fair 4-H demonstration or 4-H illustrated talk with prior permission. For permission, check with the chair or Anissa Jepsen. The exhibit must be returned to display immediately after the demonstration/illustrated talk or the exhibit will be disqualified.

20. See the last section for full details about exhibiting posters, display boards and notebooks.

#### Intermediate Division Ages 9 to 13 years

5509 Robot made from a commercial (purchased) kit. (No Programming just assembly)

5510 Robot designed by exhibitor. The robot must not be a mere modification of an existing robot kit or plan.

5511 Programmable robot made from a commercial (purchased) kit.

5546 Robot designed and constructed by exhibitor or from a commercial kit that is operated by a remote controlled device.

5544 Junk Drawer Robotics

### Senior Division Ages 14 and up

5513 Robot made from a commercial (purchased) kit (No programming just assembly)

5514 Robot designed by exhibitor. The robot must not be a mere modification of an existing robot kit or plan.

5515 Programmable robot made from a commercial (purchased) kit.

5547 Robot designed and constructed by exhibitor or from a commercial kit that is operated by a remote controlled device.

5545 Junk Drawer Robotics

### Division D – Team Robotics Project

5517 Robot designed and constructed by two or more 4-H SPACETECH project members. The robot must not be a mere modification of an existing robot kit or plan. The robot may be a programmable type that is made from a commercial (purchased) kit. This division is designed to encourage teamwork and cooperation among fellow 4-H SPACETECH members. As with many high tech projects today, no one person designs and builds a robot alone. It takes the brainstorming, planning, problem solving, and cooperation of an entire team to complete a given robotics project.

### **4-H SPACETECH – ROCKETRY**

The Kansas 4-H SPACETECH 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.

A. Exhibit Information for ALL rocketry categories:

1. SPACETECH superintendent(s) will be present on the first Friday of the fair at 5:00 p.m. to convey judging criteria and to answer questions for exhibitors. Consultation/interview judging is not available during judging on Friday.

2. All revisions of all forms previously released for the SPACETECH division either undated or dated prior to current year 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. Use of old forms will result in the loss of one ribbon placing for exhibits.

3. Relevant documents may be obtained from County Extension Offices or from [www.KansasSPACETECH.com](http://www.KansasSPACETECH.com)

4. Rocketry exhibits may be checked out for use in the Kansas State Fair 4-H demonstration or 4-H illustrated talk with prior permission. For permission, check with the chair or Anissa Jepsen. The exhibit must be returned to display immediately after the demonstration/illustrated talk or the exhibit will be disqualified.

5. NAR refers to the National Association of Rocketry and its governing board.

6. Tripoli refers to the Tripoli Rocketry Association and governing board.

7. All NAR documents, with the exception of the “pink book,” referenced herein can be found at <http://www.nar.org>.

8. If a fire 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.

9. See the last section for full details about exhibiting posters, display boards and notebooks.

#### B. Exhibit Definitions for ALL rocketry categories:

1. 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)

2. Adult supervision is defined as being under the direct supervision of someone 18 years of age or older.

3. For the purposes of Kansas 4-H SPACETECH a mid-powered rocket is defined as a rocket that uses an ‘E’, ‘F’, ‘G’, or equivalent engine for launch. In addition, rockets also qualify for mid-power if they meet any of the following criteria:

a. Is 2 inches or greater in diameter (not including fins) and taller than 3 feet (36 inches including fins) and do not use an engine(s) exceeding 160.01 Newton seconds of total impulse (an ‘H’ engine equivalent or above).

b. The total impulse of all engines used in the rocket is greater than 20.01 Newton-seconds and less than 160.01 Newton-seconds.

4. For the purposes of Kansas 4-H SPACETECH a high-powered rocket is defined as a rocket that meets any of the following criteria:

a. Weighs more than 3.3125 pounds (53 ounces or 1500 grams) at the time of launch;

b. Uses a ‘H’ engine or larger to launch

c. The total impulse of all engines used in the rocket is greater than 160.01 Newton-seconds of thrust.

d. Includes any airframes parts of ductile, metal, though, the use of ductile metal is strongly discouraged.

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 Newtons

ii. Contains in excess of 125 grams of propellant and are limited to only H and I motors.

iii. Uses a hybrid motor or a motor designed to emit sparks

1. High power certification is defined as having successfully completed a certification program for high-powered rocketry through the NAR or Tripoli and maintaining that certification. This applies to all membership levels in the NAR and Tripoli. Specifically the "Formal Participation Procedure" for the "Junior HPR Level 1 Participation Program" as outlined by the NAR and the "Tripoli Mentoring Program (TMP) as outlined by Tripoli.

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

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

C. 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 SPACETECH division.

1. 4-H members must be currently enrolled in the 4-H SPACETECH-Rocketry program to exhibit in this division.

2. Entries must have been selected at the county level for entry at the State Fair. Counties/Districts should select top blue or purple ribbon rocketry exhibits which meet Kansas State Fair guidelines.

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 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.

4. The report that accompanies the rocket must be limited to the 4-H SPACETECH Rocket Exhibit Information Form which is affixed to a 10" x 13" envelope. This envelope should NOT be attached to the rocket stand or rocket. The information form should be signed by the exhibitor. This may be downloaded from [www.KansasSPACETECH.com](http://www.KansasSPACETECH.com) 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 (Which must provide all necessary details to construct an original design rocket.), 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. Such modifications require the rocket to be swing tested and documented to show a stable flight.

6. One or more photographs of the rocket during construction and 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" x 11" page(s).
- c. There must be at least 1 page of photos and no more than 5 pages of photos.
- d. Include at least one photo showing rocket construction, preferably with the exhibitor included.
- e. Do not include photos of members catching their rockets as they return to earth. This is an unsafe practice, and we do not recommend or condone this practice.
- f. Pictures at the launch site are not required in the event of a burn ban.

7. To exhibit in this division:

- a. The rocket must have been flown, unless a burn ban is in effect.
- 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 recovery, 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 SPACETECH 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 igniters, under any circumstance, ARE NOT permitted with the exhibit and constitute 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. In that case the final stage (the one with the nose cone) should be placed on the display stand, and other stages with a loop of string to the display stand.

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/or TRIPOLI for investigation and possible revocation of membership.

D. Construction Rule for All Rockets Purpose: These rules apply to the construction of all rockets displayed in the SPACETECH 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 (i.e. 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.

d. Fin assemblies that are printed using a 3D printer are excluded from this rule. Through detailed instructions on the creation of the fin assemblies must be provided and an additional page of photos may be included to show the creation/printing of fin assemblies.

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.KansasSPACETECH.com](http://www.KansasSPACETECH.com).

5. Fins should be rounded or streamlined according to instructions. If the other edges are rounded to reduce drag on all exposed sides, there should be no ribbon deduction, unless instructions indicate to leave flat.

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

9. Any seams on plastic parts are to be sanded smooth. 39

10. Body tubes/airframes/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. However, foam may not be used for external body or other external rocket parts.

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

12. Exhibits must be uniformly painted and smoothly finished or finished as per rocket instructions, and have decals applied smoothly.

13. Non-standard surfacing (such as textured paint) may be used if directed by the instructions, this includes scratch built rockets.

14. 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-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 model from one ribbon placing to another.

15. "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.

16. Scale Model Rockets are to be finished and completed with a majority (greater than 70%) of decals.

17. If a modification is made to the rocket, for example, adding a fin, a swing test must be conducted on the rocket, and the documentation provided. Failure to test and document flight stability following modifications will result in two ribbon placing deductions.

E. Model Rocketry Specific Guidelines (ages 9 and up): Purpose: Model rockets are generally small-to-medium sized rockets that can be purchased at hobby stores that an individual(s) builds from parts similar to those found in model rocket kits.

1. Rockets classified as high or mid powered may not be entered in this category.

2. Each rocket must be able to stand freely by itself or be 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. Rod materials should be sturdy, and not made of flimsy materials, such as coat hangers.

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 base(s).

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 SPACETECH Action Team may review and implement the modified code.

F. Original Design Specific Rocket Guidelines (ages 11 and up): Purpose: To allow for youth to develop their own rockets (model, mid, and high powered) 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 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. Failure to swing test a rocket will result in a deduction of TWO ribbon placings.

6. 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.

Division A -Exhibitors 9 through 13 years old

5520 Rocket made from kit. Include plans.

Division B -Exhibitors 11 through 13 years old (9-10 year olds may not enter in this class)

5521 Rocket designed by exhibitor: not merely a modification of an existing kit. Include original plans.

Division C -Exhibitors 14 years and older

5525 Rocket made from kit. Include plans.

5526 Rocket designed by exhibitor: not merely a modification of an existing kit. Include original plans.

5527 Rocket designed by exhibitor: that uses alternative skins; not merely a modification of an existing kit. Include original plans. 40 Division D -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.

5530 Rocket designed by 2 or more exhibitors: not merely a modification of an existing kit. Include original plans.

Mid-power Rocketry (2x'D' to 'G' Engines) Guidelines:

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

1. Exhibitors must be at least 14 years of age by January 1 of the current year.
2. The rules for ALL categories apply.
3. In addition to the information packet completed for all rockets, a high/mid power information form is to be completed and placed inside of the information packet. This may be downloaded from <http://www.kansas4-H.org/>. Click on KSF Packet link.
4. Exhibitors in this division must hold memberships in either NAR or Tripoli organizations.
5. The NAR Model Rocket Safety code applies to the construction and launching of all rockets displayed in this division. As such all exhibitors must comply with the NAR Model Rocket Safety Code that is in effect as of October 1st of the current year. However in the event that there is a modification in this code the SPACETECH Action Team may review and implement the modified code.
6. All rockets in this division are to be launched under adult supervision by the 4-H member who constructed the rocket.
7. High power rockets as defined above ('H' or 'I' engines) may not be launched in this division.
8. 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.
9. Mid- 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- Exhibitors 14 years and older

5536 Mid-power rocket made from kit or original design. High Power Rocketry ('H' or 'I' engines)  
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 the current year.
2. The rules for 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.Kansas4-H.org/>. Click on KSF Packet link.

4. Exhibitors in this division must hold memberships in either NAR or Tripoli organizations.

5. The NAR High Power Rocket Safety Code applies to the construction and launching of all rockets displayed in this division. As such all 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. However in the event that there is a modification in this code the SPACETECH Action Team may review and implement the modified code.

6. All rockets in this division are to be launched under adult supervision by the 4-H member who constructed the rocket.

7. 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, and should include supporting documentation of such (a copy of Level 1 card is sufficient).

8. 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.

9. 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 F -Exhibitors 14 years and older

5535 High power rocket made from kit or original design.

Recommended County Fair rules for Rocketry This is a reduced set of rules for use at county fairs. The use of these rules is optional and left to the discretion of the county fairs. These are more simplistic rules that cover the most common scenarios that are likely to appear a county fairs. Youth who are eligible for the Kansas State Fair should read the Kansas State Fair rules for this division as the State Fair rules expect more from youth and set a higher bar as it is a state wide event exhibiting the best from across the State of Kansas. 41

1. 4-H members must be currently enrolled in the 4-H Rocketry program to exhibit in this division.

2. All rockets displayed in this division must be constructed during the current 4-H 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. Exhibitors are to complete and sign the rocketry information form, available from [www.KansasSPACETECH.com](http://www.KansasSPACETECH.com) or your local extension office, and attach it to a 10”X13” “manila” envelope. The envelope should contain:

- Instructions on how to construct the rocket
- Up to 5 pages of pictures from both construction and launch
- Documentation of any flight damage that occurred
- Any modifications made to the rocket
- An additional page for altitude calculations if the space on the form is not enough.

Additionally for original design rockets, also known as “scratch built” rockets:

- 5 additional pages of photos are allowed
- Documentation of how the rocket was tested for stability.

6. 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.

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 prevent someone from being poked in the eye.

8. 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.

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 not to be “beginner kits” or use prefabricated fin assemblies or pre-finished rockets requiring no painting, these are not acceptable outside the JR division, and should be disqualified

11. 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.KansasSPACETECH.com](http://www.KansasSPACETECH.com).

12. Fins and body tubes, 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. Exhibits must be uniformly painted and smoothly finished or finished as per rocket instructions, and have decals 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\*.' 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 model from one ribbon placing to another.
20. "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.
21. "Scale Model\*" Rockets are to be finished and completed with a majority (greater than 70%) of decals.
22. Original design rockets cannot be a modification of a pre-existing kit and must be of original design.
23. Original design rockets must be designed by the exhibitor(s).
24. Exhibitor(s) must be 11 years of age (4-H age) or older to enter an original design rocket.
25. 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.
26. 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 encouraged. Exhibitors must include documentation of the swing test. 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-H'er's are strongly encouraged to provide as much detail as possible. Failure to provide adequate written documentation will result in a disqualification. 42
28. Rockets that use more than one 'D' engine or equivalent are considered mid or high power rockets in 4-H.
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.KansasSPACETECH.com](http://www.KansasSPACETECH.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 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." 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)

Division JR - Exhibitors 7 and 8 years old

5520a Rocket made from kit, without pre-assembled fin units. Include plans.

5520b 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.)

Division A - Exhibitors 9 through 13 years old

5520 Rocket made from kit. Include plans.

Division B - Exhibitors 11 through 13 years old (9-10 year olds may not enter in this class)

5521 Rocket designed by exhibitor: not merely a modification of an existing kit. Include original plans.

Division C - Exhibitors 14 years and older

5525 Rocket made from kit. Include plans. 5526 Rocket designed by exhibitor: not merely a modification of an existing kit. Include original plans.

Division D - 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.

5530 Rocket designed by 2 or more exhibitors: not merely a modification of an existing kit. Include original plans.

Division E- Exhibitors 14 years and older

5536 Mid or high power rocket made from kit or original design.

## 4-H SPACETECH – UNMANNED AERIAL SYSTEM

Purpose: The 4-H unmanned aerial system or 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. The 4-H members must be currently enrolled in the 4-H SPACETECH 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. Counties or district should select only top blue or purple ribbon exhibits which meet State Fair guidelines.
3. The information that accompanies the UAS must be limited to the 4-H SPACETECH Exhibit Information Form which is affixed to a 10" x 13" envelope. This envelope should NOT be attached to the UAS. This may be downloaded from [www.KansasSPACETECH.com](http://www.KansasSPACETECH.com) . 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. This allows judges to get a better understanding of the exhibit and allows the youth the opportunity to fully demonstrate their exhibit. The video should be no longer than 8 minutes and should be placed on the CD, DVD, USB drive, or similar. These videos may also be considered for inclusion in a running video loop in the STEM area at the State Fair after review by judges, chair(s) and extension staff. Adult guardians must complete Video Release included with the exhibit form. If the release is not completed the video will not be included in the video loop on display in the STEM area of the Kansas State Fair.
5. Unmanned aerial system exhibits may be checked out for use in a Kansas State Fair 4-H demonstration or 4-H illustrated talk with prior permission. For permission, check with the chair or Anissa Jepsen. The exhibit must be returned to display immediately after the demonstration/illustrated talk or the exhibit will be disqualified.
6. Exhibitor's name, county or district, age, and years(s) in project must be tagged or labeled in a prominent location on the exhibit, educational display, notebook, and/or poster.
7. Unmanned Aerial System that include or depict weaponry of any kind will be disqualified.
8. See the last section for full details about exhibiting posters, display boards and notebooks.
9. If modifications are made to the exhibit a page should be attached noting those modifications.
10. If a safety violation is noted by the judges, superintendent, or other staff, the exhibitor's exhibit, at the judges' discretion, will receive a participation ribbon.

Intermediate Division –9-13 years old

5701 Unmanned Aerial System designed and constructed by exhibitor that is operated by a remote controlled device. The UAS must not be a mere modification of an existing kit or plan. You may not exhibit a UAS that is purchased off the shelf in this class.

5702 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 Russian olive trees, eroded soils, and bindweed in fields, etc. There are also many other non-agricultural UAS uses that would be appropriate for this class.

Senior Division –14 years and older

5706 Unmanned Aerial System designed and constructed by exhibitor that is operated by a remote controlled device. The UAS must not be a mere modification of an existing kit or plan. You may not exhibit a UAS that is purchased off the shelf in this class.

5707 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 Russian olive trees, eroded soils, and bindweed in fields, etc. There are also many other non-agricultural UAS uses that would be appropriate for this class.

#### **4-H SPACETECH EDUCATIONAL EXHIBITS – POSTERS, NOTEBOOKS AND DISPLAY BOARDS**

Purpose: To allow 4-Hers to explore SPACETECH outside the bounds of traditional projects for rockets, robotics, astronomy, computers and unmanned aerial system. All posters, notebooks and display boards are listed in this section and have been removed from the individual sections to save space.

1. The General Exhibit rules for ALL categories apply.
2. Entries must have been selected at the county level for entry at the Kansas State Fair. Counties/Districts should select top blue or purple ribbon Educational Rocketry Exhibits which meet State Fair guidelines.
3. For notebooks, display boards, and posters, no additional exhibit information is required; no manila envelope is needed for these exhibits.
4. Exhibits in posters, notebooks and display boards must contain substantial supporting educational materials.
5. 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 available at [www.KansasSpaceTech.com](http://www.KansasSpaceTech.com). For example, a rocket that may have crashed and/or is highly damaged may be made into an educational display or poster that tells a great story with many lessons learned.
6. 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.

7. Educational displays are not to exceed a standard commercial 3'x 4' tri-fold display board. No card table exhibits will be allowed. Care should be taken to use durable materials that will withstand Kansas State Fair conditions.

8. "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.

9. Educational Project notebooks must be organized in a 3-ring binder.

10. Any three dimensional display exhibits may not be thicker than 1".

11. Engines and igniters for rockets ARE NOT permitted with the exhibit and constitute an immediate disqualification. This is for safety reasons and includes both spent and live engines.

12. 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 education displays and/or posters the exhibitor's name, county, or district, age, and year(s) in project must be tagged or labeled on the back of the exhibit. Exhibit cards are not sufficient as they may be removed or repositioned for display. Failure to label an exhibit may result in one ribbon placing deduction.

13. 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 Astronomy. Computer System, Robotics, Rocketry, or Unmanned Aerial System

f. As well as those characteristics described above.

14. If a safety violation is noted by the judges, superintendent, or other staff, the exhibitor's exhibit, at the judge's discretion, will receive a participation ribbon.

15. Posters, Notebooks, and Display Boards may be checked out for use in a Kansas State Fair 4-H demonstration or illustrated talk with prior permission. For permission, check with the chair or Anissa Jepsen. The exhibit must be returned to display immediately after the demonstration/illustrated talk, or the exhibit will be disqualified. Astronomy

-Intermediate Division – 9-13 years old

5731 Junior Astronomy Educational Display

5732 Junior Astronomy Educational Notebook

5733 Junior Astronomy Educational Poster Astronomy

- Senior Division – 14 years and older

5736 Senior Astronomy Educational Display

5737 Senior Astronomy Educational Notebook

5738 Senior Astronomy Educational Poster Rocketry

Intermediate Division 9 through 13 years old

5741 Rocketry Educational Display

5742 Rocketry Notebook

5743 Rocketry Poster Board Rocketry

Senior Division 14 years and older

5746 Rocketry Educational Display

5747 Rocketry Notebook

5748 Rocketry Poster Board Robotics

- Intermediate Division – 9-13 years old

5756 Robotics Educational Display

5757 Robotics Educational Notebook

5758 Robotics Educational Poster Robotics

- Senior Division – 14 years and older 45

5761 Robotics Educational Display

5762 Robotics Educational Notebook

5763 Robotics Educational Poster

Robotics Team Robotics Project

5766 Team Robotics Educational Display

5767 Team Robotics Educational Notebook

5768 Team Robotics Educational Poster Computers

– Intermediate Division – 9-13 years old

5771 Junior Computer Educational Poster

5772 Junior Computer Display Board

5773 Junior Computer Notebook Computers

- Senior Division – 14 years and older

- 5776 Senior Computer Educational Poster
- 5777 Senior Computer Display Board
- 5778 Senior Computer Notebook Unmanned Aerial System  
– Intermediate Division – 9-13 years old
- 5781 Junior Unmanned Aerial System Educational Poster
- 5782 Junior Unmanned Aerial System Display Board
- 5783 Junior Unmanned Aerial System Notebook Unmanned Aerial System  
- Senior Division – 14 years and older
- 5786 Senior Unmanned Aerial System Educational Poster
- 5787 Senior Unmanned Aerial System Display Board
- 5788 Senior Unmanned Aerial System Notebook

**4-H WILDLIFE**

1. A member may make only one entry in this division.
2. Exhibitors must comply with state and federal laws. It is illegal to possess threatened or endangered wildlife, or the feathers, nests, or eggs of non-game birds. Game birds and game animals taken legally during an open season may be used. The use of live wild animals in educational exhibits is prohibited.
3. KSRE, 4-H Youth Development and the Kansas State Fair are not responsible for damage during the exhibition period.
4. Name, county or district, age and year in project should be in a prominent location on the exhibit.
5. Notebooks and Educational Displays will be judged on the following points:

Stopping Power.....	15
Is the main idea specific? Is the idea presented clearly, simply, forcefully? Interest, Holding Power.....	15
Does the exhibit give the observer additional facts in a clear, concise, informative way? 4-H Project Application.....	15
Is the subject matter an effective showcase? Mechanical Power.....	15

Correct letter size, pleasing color combination, appropriate symbols, and models Personal Growth..... 25

How much knowledge was gained by exhibitor? Was enthusiasm shown? Educational Value..... 25

Knowledge Shared. Note: Credit all citations, websites or other resources used in creating your exhibit.

6. Posters will be judged on the following points: General

Appearance..... 30  
Information..... 50  
Organization..... 20

5400 Notebook. Contents pertain to some phase, results, story or information about the wildlife project

5401 Promotional Poster. Must be related to something learned in the wildlife project. (Flat poster board or foam board no larger than 22" x 28")!

5402 Educational Display. Must be directly related to the wildlife project. Maximum tri-fold size is 3' x 4'.

5403 Taxidermy/Tanning Exhibit. Should include an attachment that shows the work in progress through photos with captions, or a detailed journaling of the process.